

Department of Computer Science (2017- 2018)
M.Sc. Computer Science – Self Supportive

Eligibility for Admission:

Bachelor's degree in Computer Science or Computer Science & Technology or B.C.A. degree of University of Madras or any other degree accepted as equivalent thereto by the Syndicate.

M.Sc. Degree Programme in Computer Science – List of Core Courses

Course Code	Title of the Courses	Core/Elective	Credits L-T-P-C	Course Faculty
First Semester				
MSIC401	Mathematics for Computer Science	C	3-1-0-4	P. Thangavel / Guest Faculty(G.F.)
MSIC402	Design and Analysis of Algorithms	C	3-1-0-4	P. Thangavel
MSI C403	Database Management Systems	C	3-1-0-4	B. Lavanya
MSIC404	Computer Graphics	C	3-1-0-4	PL. Chithra
MSIC405	Database Systems and Computer Graphics Lab.	C	0-0-2-2	Guest Faculty
	Elective	E	3-0-0-3	Faculty Concerned
	Elective	E	3-0-0-3	Faculty Concerned
	Soft Skill*	S	2-0-0-2	Faculty Concerned
Second Semester				
MSIC406	Computer Networks	C	3-1-0-4	P. Thangavel
MSIC407	Theory of Computation	C	3-1-0-4	M. Sornam/G.F.
MSI C408	Digital Image Processing	C	3-1-0-4	PL. Chithra
MSI C409	Digital Image processing Lab.	C	0-0-1-1	PL. Chithra/G.F.
	Elective	E	3-0-0-3	Faculty Concerned
	Elective	E	3-0-0-3	Faculty Concerned
	Elective	E	3-0-0-3	Faculty Concerned
	Soft Skill*	S	2-0-0-2	Faculty Concerned
Third Semester				
MSI C410	Mini Project and Group Discussion	C	0-0-2-2	All Faculty
MSI C411	Soft Computing	C	3-1-0-4	M. Sornam
MSIC412	Cryptography	C	3-1-0-4	P. Thangavel/ M. Sornam/GF
MSIC413	Big Data and Analytics	C	3-1-0-4	B. Lavanya
	Elective	E	3-0-0-3	Faculty Concerned
	Elective	E	3-0-0-3	Faculty Concerned
	Soft Skill*	S	2-0-0-2	Faculty Concerned
	Soft Skill*	S	2-0-0-2	Faculty Concerned
UOMI001	Internship-I	S	2-0-0-2	Faculty Concerned
Fourth Semester				
MSIC414	Project Work	C	0-0-15-15	All Faculty

Additional list of Elective courses for M.C.A. and M.Sc. Computer Science:

Course Code	Title of the Courses	Elective	Credits L-T-P-C	Course Faculty
MSIE401	Programming in Java and Web Technology	C	2-1-1-4	Guest Faculty (G.F.)
MSIE402	Microprocessors and Embedded Systems	E	3-0-0-3	S. Gopinathan
MSIE403	Data Mining and Data Warehousing	E	3-1-0-4	B.Lavanya
MSIE404	Software Engineering	E	3-1-0-4	S.Gopinathan
MSIE326	Mathematics for Computer Science	E	3-1-0-4	P. Thangavel

Detailed Course Contents

MSIC401/ MSIE326	Mathematics for Computer Science	3	1	0	4	P. Thangavel/ G.F.
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Unit I: Set theory: Operations on sets – Basic set identities – Relations and orderings – Functions.

Unit II: Linear algebra: Linear vector spaces - Linear operators – vectors in n-dimensions – matrix representation of vectors and operators in a basis – linear independence, dimension – inner product – Schwarz inequality – Orthonormal basis – Gram-Schmidt process – Eigenvalues and eigenfunctions of operators/matrices — Cayley Hamilton theorem – Eigen basis, Diagonalizing matrix – Quadratic forms – Complex matrices and forms- Hermitian and Unitary operators/matrices.

Unit III: Sturm-Liouville theory and Laplace transforms: Second order linear differential equations – Sturm-Liouville theory – Orthogonality of eigenfunctions – Illustration with Legendre, Laguerre, Hermite, Chebyshev differential equations - expansion of polynomials – Laplace Transforms – Solution of linear differential equations with constant coefficients- – Unit step function and Dirac delta function.

Unit IV: Fourier Integrals and Transforms: Fourier series - Fourier integral – Fourier sine and cosine transforms – Fourier transform- convolution theorem - Discrete Fourier transform and Fast Fourier transform.

Text Books:

- [1] B Kolman, R C Busby, and S* C Ross, *Discrete Mathematical Structures*, 6th Edition (Pearson Prentice-Hall, New Delhi, 2009).
- [2] E Kreyszig, *Advanced Engineering Mathematics*, 10th Edition (Wiley, NY, 2011).
- [3] M D Greenberg, *Advanced Engineering Mathematics*, 2nd Edition, International Edition (Prentice-Hall International, NJ, 1998; Pearson Education Asia, New Delhi, 2002).
- [4] J P Tremblay and R Manohar, *Discrete Mathematical Structures with Applications to Computer Science*, International Edition (McGraw-Hill, Singapore, 1987; Tata McGraw-Hill, New Delhi, 1997).

Books for Reference:

- [1] E R Scheinerman, *Mathematics: A Discrete Introduction* (Brooks/Cole/Thomson Asia, Singapore, 2001). ©

- [2] S Lipschutz, M L Lipson, and V* H Patil, *Discrete Mathematics*, 2nd Edition (Tata McGraw-Hill, New Delhi, 2006).
- [3] L A Pipes and L R Harvill, *Applied Mathematics for Engineers and Physicists*, 3rd Edition. (McGraw-Hill, NY, 1971).

MSI C402	Design and Analysis of Algorithms	3	1	0	4	M. Sornam
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UNIT I: Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis.

UNIT II: Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and biconnected components. Divide and conquer: General method , applications - Binary search, Quick sort, Merge sort, Strassen’s matrix multiplication.

UNIT III: Greedy method: General method, applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem. Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT IV: Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles. Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution. NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Cook’s theorem.

TEXT BOOK:

1. Ellis Horowitz, Sartaj Sahni, S. Rajasekaran, “Fundamentals of Computer Algorithms”, Second Edition, University Press, 2008.

REFERENCES:

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, “Introduction to Algorithms”, Third Edition, PHI Learning Private Limited, 2012.
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, “Data Structures and Algorithms”, Pearson Education, Reprint 2006.
3. Donald E. Knuth, “The Art of Computer Programming”, Volumes 1 & 3 Pearson Education, 2009.
4. Steven S. Skiena, “The Algorithm Design Manual”, Second Edition, Springer, 2008.

MSIC403	Database Management Systems	3	1	0	4	B. Lavanya
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UNIT I: Introduction to File and Database systems- Database system structure – Data Models – Introduction to Network and Hierarchical Models – Relational Model – Relational Algebra and Calculus. E-R model – diagram, generalization, specialization- Data base design - Informal design guidelines for relational schemas; functional dependencies; normal forms based on primary keys, general definitions of 2nd and 3rd normal forms; Boyce-codd normalforms.,4NF,5NF

UNIT II: SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design – Record storage and Primary file organization- Secondary

storage Devices- Operations on Files- Heap File- Sorted Files- Hashing Techniques – Index Structure for files –Different types of Indexes- B-Tree - B+Tree .

UNIT III : Query processing- query optimization - Transaction Processing – Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules – Concurrency Control – Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control .

UNIT IV: Recovery Techniques – Concepts- Immediate Update- Deferred Update - Shadow Paging- advanced recovery techniques - concepts of Database System Architectures: Centralized and Client-Server Architectures – Server System Architectures – Parallel Systems- Distributed Systems – Parallel Databases- case studies and their analysis and design.

TEXT BOOKS

1.Abraham Silberschatz, Henry F. Korth and S. Sudarshan- “Database System Concepts”, Fourth Edition, McGraw-Hill, 2002.

REFERENCES

- 1.Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.
- 2.Raghu Ramakrishnan, “Database Management System”, Tata McGraw-Hill Publishing Company, 2003.
- 3.Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- “Database System Implementation”- Pearson Education- 2000.
- 4.Peter Rob and Corlos Coronel- “Database System, Design, Implementation and Management”, Thompson Learning Course Technology- Fifth edition, 2003.

MSIC404	Computer Graphics	3	1	0	4	PL. Chithra
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UNIT – I: Overview of Computer Graphics system - Video Display Devices-Raster Scan and Random Scan Systems - Input device - Hard Copy devices - Graphics Software. Output Primitives : Line Drawing Algorithm - Circle Generation Algorithm - Character Generation Algorithm - Gray Scale Levels-Polygon filling.

UNIT – II: Two-Dimensional Transform - Basic Transformation - Composite Transformation – Translation – Rotation - Scaling-Reflections – Sheering - 2Dimensional view : Window–to-View port Coordinate Transformation - Clipping Operations - Point-Line –Polygon – Text –Curve – GUI.

UNIT – III: 3-D Geometric Transformations – 3D – Viewing – Projection Animation - 3D-Object representations-Polygons, curved lines and surfaces, Quadric surfaces, super quadrics.

UNIT –IV:– Spline representations –Interpolation- cubic splines-Bezier curves- B-Spline curves – Blobby Objects -octrees –BSP trees- Visible surface detection methods- Basic illumination models.

Text Book:

1.D. Hearn and M.P. Baker, Computer Graphics, 4th edn., PH 2011.

Reference books:

1.W. Neuman and R.F. Sproull, “ Principles of Interactive Computer Graphics, TMH, 1979.

MSIC405	Database Systems and Computer Graphics Lab.	0	0	2	2	Guest Lecturer
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DBMS Lab: Design of scientific calculator with memory- student information system - employee payroll system - inventory control system - railway reservation/ cancellation system - airline ticket and its operations - hospital management system - library management system - bank loan operational system. Graphics Lab.: Different Fills Style and draw the different simple figures - Using different fonts and display different messages - Draw a line using DDA (digital differential analyzer algorithm) - Draw a line using Bresenham's line drawing algorithm - Draw a circle and ellipse using bresenham's algorithm - Generate a character using line drawing algorithm and bit map method - Using 2D technique Draw the following: Translation, Rotation, Scaling, Sheering, Reflection(miring object) - Using clipping algorithm draw the following Line and Polygon-Using color techniques draw the following:HSV to RGB , RGB to HSV

MSIC406	Computer Networks	3	1	0	4	P. Thangavel
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Unit I: Introduction - Uses of networks - Network Architectures - OSI reference model and services – Example Networks - Physical layer - Transmission media - Guided and wireless – Digital Modulation and multiplexing – Public switched Telephone network.

Unit –II: Data link layer Design issues - error detection and correction - elementary data link protocols - sliding window protocols - Packet over SONET- ADSL. MAC sublayer protocols.

Unit-III: Network layer-design issues – Routing and congestion control algorithms, Quality of service, internetworking - Network layer in the INTERNET.

Unit IV: Transport layer – transport service - Connection management - Addressing, Establishing & Releasing a connection, Timer based Connection Management, Multiplexing, Crash Recovery, Internet transport protocol TCP, Network security-cryptography.

Text book: A. S. Tanenbaum, and D.J. Wetherall, 2012, Computer Networks, 5th Edition, - Pearson Education, Indian edition.

Reference Books

- (i) B. Forouzan, 1998, Introduction to Data Communications in Networking, Tata McGraw Hill, New Delhi.
- (ii) F. Halsall, 1995, Data Communications, Computer Networks and Open Systems, Addison Wessley.
- (iii)D. Bertsekas and R. Gallagher, 1992, Data Networks, Prentice hall of India, New Delhi.
- (iv)Lamarca, 2002, Communication Networks, Tata McGraw Hill, New Delhi.

MSIC407	Theory of Computation	3	1	0	4	M.Sornam
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UNIT I : Introduction to formal proof – Additional forms of proof – Inductive proofs –Finite Automata (FA) – Deterministic Finite Automata (DFA) – Non-deterministic Finite Automata (NFA) – Finite Automata with Epsilon transitions.

UNIT II : Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of

Automata.

UNIT III : Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages – Definition of the Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG– Deterministic Pushdown Automata.
 UNIT IV : Normal forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL – Turing Machines – Programming Techniques for TM. A language that is not Recursively Enumerable (RE) – An undecidable problem RE – Undecidable problems about Turing Machine – Post’s Correspondence Problem – The classes P and NP.

TEXT BOOK:

1. Peter Linz, “An Introduction to Formal Languages and Automata”, Third Edition ,Narosa, 2005
2. J.E. Hopcroft, R. Motwani and J.D. Ullman, “Introduction to Automata Theory, Languages and Computations”, second Edition, Pearson Education, 2007.

REFERENCES:

1. H.R. Lewis and C.H. Papadimitriou, “Elements of the theory of Computation”, Second Edition, Pearson Education, 2003.
2. Thomas A. Sudkamp,” An Introduction to the Theory of Computer Science, Languages and Machines”, Third Edition, Pearson Education, 2007.
3. Raymond Greenlaw an H.James Hoover, “ Fundamentals of Theory of Computation, Principles and Practice”, Morgan Kaufmann Publishers, 1998.
4. Micheal Sipser, “Introduction of the Theory and Computation”, Thomson Brokecole, 1997.
5. J. Martin, “Introduction to Languages and the Theory of computation” Third Edition, Tata Mc Graw Hill, 2007

MSIC408	Digital Image Processing	3	1	0	4	PL.Chithra
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Unit-I : Introduction – The origin - Fundamental steps components - Image Sampling and Quantization – Some basic relationship between pixels – Linear and nonlinear operations. Image Enhancement in spatial domain – Some Basic Gray level transformation – Histogram processing- Enhancement using Arithmetic Logic operations – Basics of spatial filtering – smoothing – sharpening – Image Enhancement in frequency domain

Unit-II: Color Image processing – color models – pseudo color Image processing – Smoothing – Sharpening – Color transformation - Color segmentation

Unit III: Wavelets – Multiresolution Processing – Image compression models – Lossy compression – Image Compression standards

Unit IV: Image segmentation – Edge Linking – Boundary Detection – Thresholding – Region Based segmentation by morphological watersheds

Text book:

1. R. C. Gonzalez and R. E. Woods , Digital image processing, 3/e , PH, 2007.

Reference:

1. Anil K.Jain, Fundamentals of Digital Image Processing, Pearson, 1989.

MSIC409	Digital Image Processing Lab.	0	0	1	1	PL.Chithra/G.F.
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Digital Image Processing: Basic image manipulation – reading, writing, quantization, sub sampling - Basic Intensity transformation - Histogram Processing-Filtering in spatial domain-2D FFT and smoothing filters-Image coding using transformations with SPIHT algorithm-Color image Enhancement with spatial sharpening.

MSIC410	Mini Project and Group Discussion	0	0	2	2	All Faculty
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Each student will take a specific problem for the Mini Project and solve it using any one of latest tool and submit a report. Further each student will participate in regular group discussion.

MSI C411	Soft Computing	3	1	0	4	M. Sornam
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UNIT I: FUZZY SET THEORY : Introduction to Neuro - Fuzzy and Soft Computing - Fuzzy Parameterization - Fuzzy Rules and Fuzzy Sets - Basic Definition and Terminology - Set-theoretic Operations - Member Function Formulation and Reasoning - Extension Principle and Fuzzy Relations - Fuzzy If-Then Rules - Fuzzy Reasoning - Fuzzy Inference Systems - Mamdani Fuzzy Models - Sugeno Fuzzy Models - Tsukamoto Fuzzy Models - Input Space Partitioning and Fuzzy Modeling.

UNIT II: OPTIMIZATION: Derivative-based Optimization - Descent Methods - The Method of Steepest Descent - Classical Newton Method - Step Size Determination - Derivative-free Optimization - Random Search - Downhill Simplex Search.

UNIT III: NEURAL NETWORKS: Supervised Learning Neural Networks - Perceptrons - Adaline - Backpropagation Mutilayer Perceptrons - Radial Basis Function Networks - Unsupervised Learning Neural Networks - Competitive Learning Networks - Kohonen Self-Organizing Networks - Learning Vector Quantization - Hebbian Learning.

UNIT IV: NEURO FUZZY MODELING and GENETIC ALGORITMS: Adaptive Neuro-Fuzzy Inference Systems - Architecture - Hybrid Learning Algorithm - Framework Neuron Functions for Adaptive Networks - Neuro Fuzzy Spectrum, Genetic algorithm, genetic algorithm applications, genetic-fuzzy model.

Text Books

1. Timothy J.Ross, -Fuzzy Logic with Engineering Applications McGraw-Hill, 1997.
2. S. Rajasekaran and G.A.V.Pai, -Neural Networks, Fuzzy Logic and Genetic Algorithms PHI, 2003.

Reference Books

1. Davis E.Goldberg, -Genetic Algorithms: Search, Optimization and Machine Learning Addison Wesley, N.Y., 1989.
- 2.R.Eberhart, P.Simpson and R.Dobbins, -Computational Intelligence - PC Tools AP Professional, Boston, 1996.
- 3.J.S.R.Jang, C.T.Sun and E.Mizutani, -Neuro-Fuzzy and Soft Computing PHI, 2004, Pearson Education 2004.
4. S.N.Sivanandam and S.N.Deepa, Principles of Soft Computing, Wiley, 2014

MSI C412	Cryptography	3	1	0	4	P. Thangavel/ M. Sornam
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Unit I: Conventional Encryption: Classical encryption techniques – Block ciphers and DES – Polynomial arithmetic – Finite fields of the form $GF(2^n)$ - Introduction to AES.

Unit II: Block ciphers – Multiple encryption, triple DES, Various block cipher modes. Random number generation – RC4 - Number Theory: Fermat’s and Euler’s theorem – Testing for primality - Chinese remainder theorem – Discrete logarithms.

Unit III:- Public key cryptosystems - RSA algorithm - Diff – Hellman key exchange – Elgamal cryptographic system – Elliptic curve arithmetic and cryptography

Unit IV: Hash functions- Hash functions based on cipher block chaining - Secure Hash algorithms (SHA) – SHA-3 - Message authentication requirements – Authentication functions - Message authentication codes (MAC) based on hash functions, and block ciphers – Introduction to Digital signatures, authentication, and key management.

Text books:

1. Stallings, W., Cryptography and Network Security Principles and Practice, sixth edition, Pearson Education, 2014.
2. Hoffstein J., Pipher J., Silverman J.H., An Introduction to Mathematical Cryptography, Springer, 2008.

Reference Books:

1. C. Kaufman, R. Perlman, M. Speciner, Network Security- Private Communication in a public world, 2/e, Prentice Hall, 2002.
2. M. Welschenbach, Cryptography in C & C++, John Wiley, 2005.
3. B. Schneier, Applied Cryptography, 2/e, Wiley, 1996.
4. K. N. Gupta , K. N. Agarwala, P. Agarwala, Digital Signature: Network security practices, PHI, 2005.

MSIC413	Big Data and Analytics	3	1	0	4	B.Lavanya
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Unit – I : Basic nomenclature - Analytics process model - Analytics model requirements - Types of data sources – Sampling - types of data elements - Visual Data Exploration and Exploratory Statistical Analysis - Missing Values - Outlier Detection and Treatment - Standardizing Data – Categorization - weights of evidence coding - Variable selection - Segmentation.

Unit –II : Predictive Analytics: Target Definition - Linear Regression - Logistic Regression - Decision Trees - Neural Networks - Support Vector machines - Ensemble Methods - Multiclass Classification Techniques - Evaluating Predictive Models.

Unit – III :Descriptive Analytics: Association Rules - Sequence Rules - Segmentation. Survival Analysis: Survival Analysis Measurements - Parametric Survival Analysis.

Unit – IV : Social Network Analytics: Social Network Definitions - Social Network Metrics - Social Network Learning -Relational Neighbor Classifier - Probabilistic Relational Neighbor Classifier -Relational logistic Regression - Collective Inference. Benchmarking - Data Quality - Software – Privacy - Model Design and Documentation - Corporate Governance. Example applications: Credit Risk Modeling - Fraud Detection - Recommender Systems - Web Analytics.

Text book:

Bart Baesens, 2014, Analytics in a Big Data World: The Essential Guide to Data Science and Its applications, Wiley India Private Limited

References:

1. Michael Minelli, Michele Chambers, 2013, Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses, Wiley CIO
2. Stephan Kudyba, 2014, Big Data, Mining and Analytics: Components of Strategic Decision Making, CRC Press.
3. Frank J. Ohlhorst, 2013, Big data Analytics: Turning Big Data into Big Money, Wiley and SAS Business Series.
4. Foster Provost, Tom Fawcett, 2013, Data Science for Business, SPD.

MSIC414	Project Work	0	0	16	16	All Faculty
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Each student will do a project work and submit report of their work done.

MSIE401	Programming in Java and Web Technology	2	1	1	4	M.Sornam/G.F.
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UNIT I : Introduction to java - Features of java - Object Oriented Concept - Lexical Issues - Data Types - Variables - Arrays – Operators - Control Statements. Classes – Objects – Constructors – Overloading method – Access Control – Static and fixed methods – Inner Classes – String Class – Inheritance – Overriding methods -Using super – Abstract class.

UNIT II: Packages – Access Protection – Importing Packages – Interfaces-Exception Handling-Throw and Throws-Thread-Synchronization-Messaging- Runnable Interface - Inter thread Communication – Deadlock - Suspending, Resuming and stopping threads - Multithreading.

UNIT-III: I/O Streams-Applets-String Objects-String Buffer-Char Array-Java Utilities-Code Documentation. Working using AWT Classes – Graphics - AWT Controls-Layout Managers and Menus –Events-Event Handling.

Unit IV: History of the Internet and World Wide Web – HTML 4 protocols – HTTP, SMTP, POP3, MIME, IMAP.- Web Pages - types and issues, tiers; web client and web server, HTML different tags, sections, image & pictures, listings, tables, frame, frameset, form. Dynamic HTML - DHTML, CSS, frames, navigator, Event Model –Form process – Creating Images – Adding shadows – Gradients – Creating Motion with Blur – Data Binding – Simple Data Binding – Moving with a record set – Sorting table data – Binding of an Image and table.- XML – Introduction – DTD- XML DOM – XSLT- Xpath- X forms- Xquery- databases - Java script - variables, operators, conditional statements, array object, date object, string object, front end validation, Event Handling - ASP - web hosting – web services- web server technologies- e-commerce- future of web technology – recent trends and products.

Text books:

1. P. Naughton and H. Schildt, Java2 (The Complete Reference), 3/e, TMH,1999.
2. K. Arnold and J. Gosling, D. Holmes, The Java Programming Language, 4/e, Addison Wesley Professional, 2005.
3. Dietel, Dietel Nieto, Internet and World Wide Web- how to program, Pearson publishers, 1st edition,2000.

Reference Books

1. J. Lewis, W. Loftus, Java Software Solutions, Addison-Wesley, 2007
2. P. Deitel and H. Deital, Java for programmers, Pearson, 2009
3. Horstmann, Core Java Vol. 1 Fundamentals, Eighth Edition, Pearson, 1999.
4. Godbole A. S. & Kahate A., Web Technologies, TMH, 2nd edition, 2008.

MSI E402	Microprocessors and Embedded Systems	2	0	1	3	S. Gopinathan
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Unit I: Introduction to Embedded Systems: Introduction - Standard component of Embedded Systems - Processor, Memory, I/O, Peripherals, Software, Algorithms -Processor types - Microcontrollers, Microprocessors, DSP, FPGA, Memory types - RAM, SRAM, DRAM, DDRAM, EPROM, EEPROM, OTP Peripherals - Parallel and Serial Ports, UART, Timers, Real time clocks, I2C bus, DMA controllers Analogue Interfaces - A-D and D-A conversion, CODECs -Interrupts and Interrupt handling.

Unit II: 8051 Architecture and C51 Assembly Language Programming 8051 Architecture - Oscillator, Clock, Internal memory and RAM, SFRs, Internal ROM, I/O pins and ports - External memory, Counters and Timers, Serial Data I/O, Interrupts, Assembly language instructions, Data operations, logical operations, arithmetic operations, Program control, Configuration and programming of 8051 Ports, Timers and Interrupts -Interfacing 8051 with LEDs, Keypad and 7-Segment Display and programming - Interfacing with LCD and programming - Interfacing with ADC and programming - Serial Data Communication programming. Embedded C: Embedded Software development using C - Porting 8051 Assembly code to C - Cross compilation, Downloading, Testing, Debugging.

Unit III : Design of Embedded Systems - Problem definition, requirements and specifications -Software planning - Hardware design and software design. Mini Project - Flexible timings for the project work - To be done on the hardware kit or else you can design your own hardware on breadboard or GP board. Design challenge would cover most of the concepts learned in the training period.

Text books.

1. Jack Ganssle, The Art of Designing Embedded Systems.
2. David Simon, An Embedded Software Primer, Addison Wesley, 2000
3. C.M. Krishna and Kang G. Shin, RTS: Real-Time Systems, McGraw-Hill, 1997.

Reference books:

1. Mathur ,Introduction to Microprocessor, 4/e, PHI, 2012.
2. D. V. Hall, Microprocessors and Interfacing: Programming and Hardware, 4/e, TMH, 2008.

MSIE403	Data Mining and Warehousing	3	1	0	4	B. Lavanya
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UNIT I: Why preprocessing, Cleaning, Integration, Transformation, Reduction, Discretization, Concept Hierarchy Generation, Data Mining Primitives, Query Language, Graphical User Interfaces, Architectures, Concept Description, Data Generalization, Characterizations, Class Comparisons, Descriptive Statistical Measures.

UNIT II: Association Rule Mining, Single-Dimensional Boolean Association Rules from Transactional Databases, Multi-Level Association Rules from Transaction Databases-

Classification and Prediction, Issues, Decision Tree Induction, Bayesian Classification, Association Rule Based

UNIT III: Other Classification Methods- neural network based, genetic algorithm- decision tree – CART-Prediction, Classifier Accuracy-Cluster Analysis-Types of data, Categorization of methods, Partitioning methods, Outlier Analysis- web mining - methods and algorithms- Applications and Trends in Data Mining – Introduction to data mining software and usage.

UNIT IV: Introduction, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Implementation, Further Development, Data Warehousing to Data Mining – schemas- partition strategy – aggregations – process managers - physical layout – security- back up and recovery – SLA – capacity and tuning – testing the DW- future of DW – case study.

TEXT BOOK

1. J. Han, M. Kamber, “Data Mining: Concepts and Techniques”, Harcourt India / Morgan Kauffman, 2nd edition, 2001.
2. S. Anahory, D. Murry, “Data Warehousing in the real world”, Pearson Education, 2nd edition, 2003.

REFERENCES

1. M. H. Dunham, “Data Mining: Introductory and Advanced Topics”, Pearson Education , 1st edition, 2004.
2. David Hand, Heikki Manila, Padhraic Smyth, “Principles of Data Mining”, PHI 2004.
3. W.H.Inmon, “Building the Data Warehouse”, 3rd Edition, Wiley, 2003.
4. Alex Bezon, Stephen J.Smith, “Data Warehousing, Data Mining & OLAP”, McGraw-Hill Edition, 1st edition, 2001.

MSIE404	Software Engineering	3	1	0	4	S. Gopinathan
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UNIT – I: Introduction to Software Engineering - Layered technology-processing framework - Waterfall model - Incremental model-Spiral model – Requirement Engineering task - Initial Requirement Engineering process - Analysis model.

UNIT – II: Software Matrices – Estimations – Planning - Fundamentals of Requirement concepts - Structure Analysis (SADT)

UNIT – III: Object oriented Analysis and Data Modeling - Alternate Analysis techniques - Specification Techniques - Software Design and implementation.

UNIT – IV: Software Testing Techniques and Strategies - Software quality assurance - Software Maintenance - Different type of ISO-Computer Aided Software Engineering Integrated Environments(CASE).

Text Books:

- 1.R. S.Pressman “Software Engineering “ A Practitioner’s Approach . 5th Edition, TMH, 2011

Reference Books:

1. I. Sommerville, ”Software Engineering “ 5th Edition, Addison Wesley, 2004
2. R. Failrely , “ Software Engineering Concepts “ , 4/e, TMH, 2008.