M.D. UNIVERSITY
SCHEME OF STUDIES AND EXAMINATION
M.TECH 1st YEAR (SOFTWARE ENGINEERING)
SEMESTER 1st
CBCS Scheme effective from 2016-17

Sr. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	No of hours /week
			L	T	P	Total Credits	Marks of Class works	Theory	Practical	Total		
1	16MSE21C1	Advanced Software Engineering	4	0	-	4	50	100	-	150	3	4
2	16MSE21C2	Software Project Management	4	0	-	4	50	100	-	150	3	4
3	16MSE21C3	Software Architecture	4	0	-	4	50	100	-	150	3	4
4	16MSE21C4	Web Development	4	0	-	4	50	100	-	150	3	4
5	16MSE21C5	Analysis and Design of Algorithms	4	0	-	4	50	100	-	150	3	4
6	16MSE21C6	Seminar	-		2	2	50	-	-	50		2
7	16MSE21CL1	Web Development Lab	-	-	2	2	50	-	50	100	3	2
8	16MSE21CL2	Analysis and Design of Algorithms Lab	-	-	2	2	50	-	50	100	3	2
		TOTAL	**26**									

NOTE:

Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

M.D. UNIVERSITY
SCHEME OF STUDIES AND EXAMINATION
M.TECH 1st YEAR (SOFTWARE ENGINEERING)
SEMESTER 2nd
CBCS Scheme effective from 2016-17

Sr. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	No of hours/ week
			L	T	P	Total Credits	Marks of Class works	Theory	Practical	Total		
1	16MSE22C1	Object Oriented Software Engineering	4	0	-	4	50	100	-	150	3	4
2	16MSE22C2	Advance Data Structure	4	0	-	4	50	100	-	150	3	4
3	16MSE22C3	Seminar	-		2	2	50	-	-	50		2
4	16MSE22CL1	Advance Data Structure Lab	-	-	2	2	50	-	50	100	3	2
5	16MSE22CL2	Operating Systems Lab	-	-	2	2	50	-	50	100	3	2
6	16MSE22D1 Or 16MSE22D2 or 16MSE22D3 Or 16MSE22D4	Elective-1	4	0	-	4	50	100	-	150	3	4
7		Open Elective				3						
8		Foundation Elective				2						
			23									

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

Elective 1

16MSE22D1 Operating Systems
16MSE22D2 Data Mining
16MSE22D3 Software Reuse
16MSE22D4 Semantic Web

Elective 2: Choose any one from the following papers

A candidate has to select this paper from the pool of Open Electives provided by the University

Elective 3

A candidate has to select this paper from the pool of Foundation Electives provided by the University.

16MSE21C1 ADVANCED SOFTWARE ENGINEERING

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

INTRODUCTION:
System Concepts – Software Engineering Concepts - Software Life Cycle– Development Activities – Managing Software Development – Unified Modelling Language – Project Organization – Communication.

UNIT 2
ANALYSIS:
Requirements Elicitation – Use Cases – Unified Modelling Language, Tools – Analysis Object Model (Domain Model) – Analysis Dynamic Models – Non-functional requirements – Analysis Patterns.

UNIT 3

SYSTEM DESIGN, IMPLEMENTATION AND CHANGE MANAGEMENT:
Overview of System Design – Decomposing the system -System Design Concepts – System Design Activities – Addressing Design Goals – Managing System Design. Programming languages and coding- Human computer interaction-Reusing Pattern Solutions – Specifying Interfaces – Mapping Models to Code – Testing Rationale Management – Configuration Management – Project Management -real time interface design.

UNIT 4

ASPECT ORIENTED SOFTWARE DEVELOPMENT:
AO Design Principles -Separations of Concerns, Subject Oriented Decomposition, Traits, Aspect Oriented Decomposition, Theme Approach, Designing Base and Crosscutting Themes, Aspect-Oriented Programming using Aspect-J.

References:

1. Fundamentals of software Engineering, Rajib Mall, PHI
2. Software Engineering by Ian sommerville, Pearson Education.
3. Software Engineering – David Gustafson, 2002, Tata McGraw Hill.
4. Software Engineering Fundamentals, Oxford University, Ali Behforooz and Frederick J. Hudson.
5. An Integrated Approach to software engineering by Pankaj jalote.
6. Software Engineering by Roger S. Pressman, Tata McGraw Hill.

16MSE21C2 SOFTWARE PROJECT MANAGEMENT

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

PROJECT EVALUATION AND PROJECT PLANNING : Importance of Software Project Management – Activities Methodologies – Categorization of Software Projects – Setting objectives – Management Principles – Management Control – Project portfolio Management – Cost-benefit evaluation technology – Risk evaluation – Strategic program Management – Stepwise Project Planning.

UNIT 2

PROJECT LIFE CYCLE AND EFFORT ESTIMATION : Software process and Process Models – Choice of Process models – mental delivery– Rapid Application development – Agile methods – Extreme Programming – SCRUM – Managing interactive processes – Basics of Software estimation – Effort and Cost estimation techniques – COSMIC Full function points – COCOMO II A Parametric Productivity Model – Staffing Pattern.

UNIT 3

RISK MANAGEMENT: Risk identification – Assessment – Monitoring – PERT technique – Monte Carlo simulation – Resource Allocation – Creation of critical patterns – Cost schedules.

QUALITY PLANNING: Quality Concepts, Procedural Approach to Quality Management, Quantitative Approaches to Quality Management, Quantitative Quality Management Planning, Setting the Quality Goal, Estimating Defects for Other Stages, Quality Process Planning, Defect Prevention Planning.

UNIT 4

PROJECT MANAGEMENT AND CONTROL: Framework for Management and control – Collection of data – Visualizing progress – Cost monitoring – Earned Value Analysis- Project

tracking – Change control- Software Configuration Management – Managing contracts – Contract Management.

STAFFING IN SOFTWARE PROJECTS : Managing people – Organizational behavior – Best methods of staff selection – Motivation – The Oldham-Hackman job characteristic model – Ethical and Programmed concerns – Working in teams – Decision making – Team structures – Virtual teams – Communications genres – Communication plans.

TEXTBOOK:

1. Bob Hughes, Mike Cotterell and Rajib Mall: Software Project Management – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.

REFERENCES:

1. Robert K. Wysocki "Effective Software Project Management" – Wiley Publication,2011.
2. Pankaj Jalote, Software project management in practice, Addison-Wesley
3. Walker Royce: "Software Project Management"- Addison-Wesley, 1998.
4. Gopalaswamy Ramesh, "Managing Global Software Projects" – McGraw Hill Education (India), Fourteenth Reprint 2013.

16MSE21C3 SOFTWARE ARCHITECTURE

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Software Architecture Terms: Component, Relationship, View, Architectural styles, Frameworks, Methodologies, Processes, Functional and Non-functional properties of software architecture.

UNIT 2

Enabling Techniques for Software Architecture: Abstraction, encapsulation, Information Hiding modularization, Separation of concerns, coupling and Cohesion. Sufficiency, Completeness and Primitiveness separation of policy and implementation. Separation of interface and implementation

UNIT 3

Architectural Styles: pipes and filters, Data abstraction and object-orientation, Event-based, implicit invocation, Layered systems, Repositories, Interpreters, Process control, Heterogeneous Architectures.

UNIT 4

Software Implementation-Development Environment Facilities: code generation, reverse engineering, profiling, software libraries, testing and debugging. Software quality: changeability, efficiency, interoperability, Reliability, testability, reusability, fault tolerant software.

References:

1. M.Shaw: Software architecture perspective on an Emerging Discipline, Prentice Hall .
2. Len Bass. Paul clements, Rick Kazman : software architecture in practice, pearson education Asia

16MSE21C4 WEB DEVELOPMENT

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Web search basics: Background and history, Web characteristics, Advertising as the economic model ,The search user experience, Index size and estimation, Near-duplicates and shingling.

UNIT 2

Web crawling and indexes: Overview, Crawling, Distributing indexes, Connectivity servers. Link analysis: The Web as a graph, PageRank, Hubs and authorities

UNIT 3

Web Servers (IIS/PWS & Apache): HTTP request types, system architecture, client-side scripting, accessing web servers requesting documents, HTTP, secure HTTP, Secure Sockets Layer, WWW Proxies, Basic Feature Bookmarks, Cookies, Progress Indicators, Customization of Browsers, Browsing Tricks, Next Generation Web Browsing,

UNIT 4

DHTML, XHTML, AJAX, XML: Structuring data, XML namespaces, DTD and schemas, XML variables, DOM methods, simple API for XML, Web services, and application of XML. Active Server Pages (ASP): How ASP works, ASP objects, file system, objects, ASP.NET

References:

1. Fundamentals of the Internet and the World Wide Web, Raymond GreenLaw and Ellen Hepp-2011, TMH.
2. Internet and World Wide Web Programming, Deitel, Deitel and Neito, 2000, Pearson
3. Introduction to Information Retrieval, Christopher D. Manning, PrabhakarRaghavan&HinrichSchutze, Cambridge university press, 2008
4. Beginning XHTML by Frank Boumpery, Cassandra Greer, Dave Ragett, Jenny Ragett,

SubastiaSchintenbaumer and Ted Wugofski 2000,WROX Press(Indian Shroff Publication SPD)1st Edison.

5. Complete Reference Guide to Java Script, Aron Weiss,QUIE,1977.
6. Intranet and Internet Engg. By Minoli.

16MSE21C5 ANALYSIS & DESIGN OF ALGORITHMS

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

ANALYSIS ALGORITHMS & PROBLEMS: Introduction to algorithms, Time and Space Complexity, Basic elements of data structures like link lists, Stacks and Queues, Trees , Graphs, Recursion. Different types of sorting algorithms and their complexities. DYNAMIC SETS, SEARCHING GRAPHS : Introduction, Array, amortized time analysis, red black trees, hashing heaps, dynamic equivalence relations and union-find programs, priority queues with decrease key operations, traversing graphs, DFS strongly connected components, bioconnected components, minimum spanning tree algo., single source shortest paths, all pair shortest paths.

UNIT 2

GREEDY AND DYNAMIC METHODS: Introduction to greedy and dynamic methods, their algorithms and comparative study.

UNIT 3

BACKTRACKING AND BRANCH&BOUND: General backtracking and branch and Bound methods, 8 queen, sum of subset, graph coloring, Hamilton cycles, 0/1 knapsack problem.

UNIT 4

NP HARD AND NP COMPLETE PROBLEMS: Basic Concepts, Cooks Theorem, P – Hard graph problems, NP Hard Scheduling.

References:

1. Computer Algorithms: Introduction to design and analysis (3rdedition) by Sara Baase and Allen Van Gelder , Pearson, 2000.

2. Fundamentals of Algorithms by Gilles Brassard and Paul Bratley
3. Design and Analysis of Algorithms (Computer science Series) by Jeffrey D. Smith Publ.
4. Fundamentals of Computer algorithms, Ellis Horowitz and SratajSahnim 1978, Galgotia publ.
5. Algorithms Design (PIE) by Eva Tardos and Jon Klienberg, person.
6. Introduction to Algorithms, Thomas h Cormen, Harles E leiserson and Ronald Lrivest : 1990, TMH.

16MSE21C6 SEMINAR

L T P			Marks	Credits
- - 2	**Sessional**	**:**	50	**2**
	Total	:	50	

A candidate has to present a seminar on a recent topic/ technology/ research advancement and has to submit a seminar report. The marks will be given on the basis of seminar report, contents of the presentation, communication and presentation skills.

16MSE21CL1 WEB DEVELOPMENT LAB

			Marks	Credits
L T P	**Exam**	**:**	50	2
- - 2	**Sessional**	**:**	50	
	Total	**:**	100	

A student has to perform 10-12 practicals based on theory paper.

16MSE21CL2 ANALYSIS AND DESIGN OF ALGORITHMS LAB

			Marks	Credits
L T P	**Exam**	**:**	50	2
- - 2	**Sessional**	**:**	50	
	Total	**:**	100	

A student has to perform 10-12 practicals based on theory paper.

16MSE22C1 OBJECT-ORIENTED SOFTWARE ENGINEERING

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Introduction – Overview of Object-Orientation; Basic Concepts of Object-Orientation: Data abstraction, Encapsulation, Inheritance, Aggregation, Classes, Objects, Messages, Inheritance, Polymorphism, Object oriented modeling, OO Life cycle models.

UNIT 2

Object Oriented Methodology: Rumbaugh methodology, Booch methodology, Jacobson methodology, Patterns, frameworks, the unified modeling language (UML).
Requirement Elicitation: Concept, Activity, Techniques, Requirements Model-Action & Use cases.
Architecture: Requirement Model, Analysis Model, Design Model, Implementation Model, Test Model.

UNIT 3

Object–Oriented Analysis: Use-Case Driven Object Oriented Analysis, Use-Case Model, Object Classification, Classification Theory, Approaches for identifying classes, classes, responsibilities and collaborators, identifying Object Relationships, attributes and Methods.
Object –Oriented Design process and design Axioms

UNIT 4

Testing Object System: Introduction, Testing Activities and Techniques, Testing processes, managing testing.

References:

1. Ivar Jacobson, “Object Oriented Software Engineering”, Pearson.
2. Grady Booch, James Runbaugh, Ivar Jacobson, “The UML User Guide”, Pearson.
3. Reference Books:

4. Rumbaugh et. al, “Object Oriented Modeling and Design”, Pearson.
5. Booch, Maksimchuk, Engle, Young, Conallen and Houstan, “Object Oriented Analysis and Design with Applications”, Pearson Education.

16MSE22C2 ADVANCED DATA STRUCTURE

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Data Structure: Introduction to data structures and algorithms, Linear and nonlinear data structures.
Algorithm Analysis: time complexity and space complexity, Time space trade off and Big O Notation, efficiency of algorithms, Worst case and average case analysis.
Arrays: Introduction, one dimensional and multidimensional arrays, memory representation of arrays, operations on arrays, sparse matrices and their implementation, Advantages and limitation of arrays.
Stacks: Introduction; Operation on stacks, Static and Dynamic Implementation of stacks
Application of Stacks: matching parenthesis, evaluation of arithmetic expressions, conversion from infix to postfix, recursion.
Queues: introduction, operation on queues, Static and Dynamic Implementation of Queues, circular queues, Dequeues, priority queues, application of queues.

UNIT 2

Linked List: Introduction, Operations on linked list, Circular linked list, Doubly linked list, Header linked list, Implementation of linked list, Application of linked lists.

UNIT 3

Trees: Introduction, Binary Tree, Tree traversal Algorithms, Threaded Binary Trees, Binary Search Tree, AVL Tree, M-way search tree, B-Trees, Heap.
Graphs: Introduction, Memory Representation of Graphs: adjacency matrix representation of graphs, adjacency list or linked list representation of graphs. Operations performed on graphs, Graph traversal algorithms, Shortest Path algorithm, Minimum Spanning Tree, Applications of graph.

UNIT 4

Sorting and Searching: Bubble Sort, Selection Sort, Insertion Sort, Merge Sort, Radix Sort, Quick Sort and Heap Sort. Linear Search, Binary Search.
Hashing - Hashing Functions, Collision Resolution Techniques.

References:

1. Tanenbaum, A. S., “Data Structures using ‘C’”, PHI
2. Seymour Lipschultz, “Theory and Practice of Data Structures", McGraw-Hill
3. S. Sahni, "Data Structures, Algorithms and Application in C++, McGraw-Hill
4. M. A. Weiss, "Data Structures and Algorithm Analysis in C++, Pearson Education,
5. Aho Alfred V., Hopperoft John E., UIlman Jeffrey D., “Data Structures and Algorithms”, Addison Wesley
6. Drozdek- Data Structures and Algorithms,

16MSE22C3 SEMINAR

L T P			Marks	Credits
- - 2	**Sessional**	**:**	50	**2**
	Total	:	50	

A candidate has to present a seminar on a recent topic/ technology/ research advancement and has to submit a seminar report. The marks will be given on the basis of seminar report, contents of the presentation, communication and presentation skills.

16MSE22CL1 ADVANCE DATA STRUCTURE LAB

			Marks	Credits
L T P	**Exam**	**:**	50	2
- - 2	**Sessional**	**:**	50	
	Total	**:**	100	

A student has to perform 10-12 practicals based on theory paper.

16MSE22CL2 OPERATING SYSTEMS LAB

			Marks	Credits
L T P	**Exam**	**:**	50	2
- - 2	**Sessional**	**:**	50	
	Total	**:**	100	

A student has to perform 10-12 practicals based on theory paper.

16MSE22D1 OPERATING SYSTEMS

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Fundamentals of Operating system: Overview – Synchronization Mechanisms – Processes and Threads - Process Scheduling – Deadlocks: Detection, Prevention and Recovery – Models of Resources – Memory Management Techniques.

UNIT 2

Distributed Operating Systems: Issues in Distributed Operating System – Architecture – Communication Primitives – Lamport's Logical clocks – Causal Ordering of Messages – Distributed Mutual Exclusion Algorithms – Centralized and Distributed Deadlock Detection Algorithms – Agreement Protocols.

UNIT 3

Distributed Resource Management: Distributed File Systems – Design Issues - Distributed Shared Memory – Algorithms for Implementing Distributed Shared memory–Issues in Load Distributing – Scheduling Algorithms – Synchronous and Asynchronous Check Pointing and Recovery – Fault Tolerance – Two-Phase Commit Protocol – Nonblocking Commit Protocol – Security and Protection.

UNIT 4

Real Time And Mobile Operating Systems : Basic Model of Real Time Systems - Characteristics- Applications of Real Time Systems – Real Time Task Scheduling - Handling Resource Sharing - Mobile Operating Systems –Micro Kernel Design - Client Server Resource Access – Processes and Threads - Memory Management - File system. CASE STUDIES of Linux System: Design Principles - Kernel Modules - Process Management Scheduling - Memory Management - Input-Output Management - File System – Inter-process Communication. iOS and Android: Architecture and SDK Framework - Media Layer - Services Layer - Core OS Layer - File System.

References:

1. MukeshSinghal and N. G. Shivaratri, “Advanced Concepts in Operating Systems”, McGrawHill, 2000
2. Abraham Silberschatz, Peter B. Galvin, G. Gagne, “Operating System Concepts”, Sixth Addison n Wesley Publishing Co., 2003.
3. Andrew S. Tanenbaum, “Modern Operating Systems”, Second Edition, Addison Wesley, 2001.

16MSE22D2 DATA MINING

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Data Mining: Introduction, association rules mining, Naive algorithm, Apriori algorithm, direct hashing and pruning (DHP), Dynamic Item set counting (DIC), Mining frequent pattern without candidate generation(FP, growth), performance evaluation of algorithms, Mining Customer values: From Association rule to direct mining: A case study.

UNIT 2

Classification: Introduction, decision tree, tree induction algorithm – split algorithm based on information theory, split algorithm based on Gini index; naïve Bayes method; estimating predictive accuracy of classification method; classification software, software for association rule mining; case study; KDD Insurance Risk Assessment: A Case study.

UNIT 3

Cluster analysis: Introduction, partitional methods, hierarchical methods, density based methods, dealing with large databases, cluster software; Efficient Clustering of Very Large Document Collections: A case study.

UNIT 4

Web Data Mining: Web Terminology and Characterstics, Locality and Hierarchy in the web, Web Content Mining, Web Usage Mining, Web Structure Mining, Web mining Software. Search engines: Characterstics of Search engines, Search Engine Functionality, Search Engine Architecture, Ranking of web pages, the search engine history, Enterprise Search, Enterprise Search Engine Software.

References :

1. Han J., Kamber M. and Pei J., Data mining concepts and techniques, Morgan Kaufmann Publishers (2011) 3rd ed.
2. Pudi V., Krishana P.R., Data Mining, Oxford University press, (2009) 1st ed.

3. Adriaans P., Zantinge D., Data mining, Pearson education press (1996), 1st ed.
4. Pooniah P., Data Warehousing Fundamentals,Willeyinterscience Publication, (2001),

16MSE22D3 SOFTWARE REUSE

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Introduction Software Reuse and Software Engineering, Concepts and Terms, Software Reuse Products, software reuse Processes, Software Reuse Paradigms.

State of the art and the Practice: Software reuse management, Software reuse techniques, Aspects of software reuse, Organisational aspects, Technical aspects and Economical aspects.

UNIT 2

Programming Paradigms and Reusability: Usability Attributes,Representation and Modelling Paradigms, Abstraction and Composition in development paradigm.

UNIT 3

Object-Oriented Domain Engineering: Abstraction and Parameterised techniques, Composition techniques in Object Orientation.

UNIT 4

Application Engineering: Component Storage andRetrieval, Reusable Asset Integration. Software Reuse Technologies: Component based Software Engineering, COTs based development, Software Reuse Metrics, Toolsfor Reusability.

References:

1. Reuse Based Software techniques, Organisation and Measurement by HafedhMiliSherifYacoub and Edward Eddy, John wiley&Sons Inc.

2. The Three Rs. Of Software Automation: Re-engineering, Repository, Reusablity by CamaMCClure, Prentice Hall.

3. McClure,Carma,L.Software Reuse Techniques: adding reuse to the system development processes/:Prentice Hall.

4. Poulin, Jeffery S. Measuring software reuse : principles, practices and economic models/ Jeffery S.Poulin Reading, Mass:Addison Wesley.

16MSE22D4 **SEMANTIC WEB**

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Introduction to the Syntactic web and Semantic Web – Evolution of the Web – The visual and syntactic web – Levels of Semantics – Metadata for web information - The semantic web architecture and technologies –Contrasting Semantic with Conventional Technologies – Semantic Modeling - Potential of semantic web solutions and challenges of adoption

UNIT 2

Ontologies – Taxonomies –Topic Maps – Classifying Ontologies – Terminological aspects: concepts, terms, relations between them – Complex Objects –Subclasses and Sub-properties definitions – Upper Ontologies – Quality – Uses - Types of terminological resources for ontology building – Methods and methodologies for building ontologies – Multilingual Ontologies -Ontology Development process and Life cycle – Methods for Ontology Learning – Ontology Evolution – Versioning

UNIT 3

Structured Web Documents - XML – Structuring – Namespaces – Addressing – Querying – Processing - RDF – RDF Data Model – Serialization Formats- RDF Vocabulary –Inferencing - RDFS – basic Idea – Classes – Properties- Utility Properties – RDFS Modeling for Combinations and Patterns- Transitivity

UNIT 4

OWL – Sub-Languages – Basic Notions -Classes- Defining and Using Properties – Domain and Range – Describing Properties - Data Types – Counting and Sets- Negative Property Assertions – Advanced Class Description – Equivalence – Owl Logic. Development Tools for Semantic Web – Jena, Protégé, Swoop and TopBraid Composer – SPARQL –Querying semantic web - Semantic Wikis - Semantic Web Services – Modeling and aggregating social

network data - Ontological representation of social relationships, Aggregating and reasoning with social network data

References:

1. RajendraAkerkar: “Foundations of the Semantic Web”, Narosa Publishing House, New Delhi and Alpha Science Intern., Oxford 2009
2. Jeffrey T. Pollock: “Semantic Web for Dummies”, John Wiley, 2009.
3. Liyang Yu, “A Developer's Guide to the Semantic Web”, Springer, First Edition, 2011
4. John Hebeler, Matthew Fisher, Ryan Blace and Andrew Perez-Lopez, “Semantic Web Programming”, Wiley, First Edition, 2009.
5. Grigoris Antoniou, Frank van Harmelen, “A Semantic Web Primer”, Second Edition (Cooperative Information Systems) (Hardcover), MIT Press, 2008
6. Robert M. Colomb, “Ontology and the Semantic Web”, Volume 156 Frontiers in Artificial Intelligence and Applications (Frontier in Artificial Intelligence and Applications), IOS Press, 2007.
7. Dean Allemang and James Hendler, “Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL, Morgan Kaufmann”, Second Edition, 2011.
8. Thomas B. Passin, “Explorer’s Guide to the Semantic Web (Paperback)”, Manning Publications 8 Jul 2004