FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

Master of Science (Computer Science)

(Semester I - IV)

(Under Continuous Evaluation System)

Session: 2019-20

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR (Autonomous)

PROGRAMME SPECIFIC OUTCOMES

Master of Science (Computer Science)

(Session 2019-20)

PSO1: Master in Computer Science offers significant benefits to students. After successfully completing their M.Sc. students will able to fit themselves as desirable candidates for industry, teaching and other competitive exams.

PSO2: Students will enhance their knowledge and understanding of computer architecture and Microprocessors.

PSO3: Students will enhance their ability to solve programming problems knowing the concepts of JAVA, ASP.NET and Object Oriented Programming to develop software for real world related problems

PSO4: Student will learn principles and techniques from the selective areas to develop special expertise. Such expertise will be used for analyzing real-world problems and devise computer-based solutions.

PSO5: Students with gain knowledge of research oriented topics like Cloud computing and image processing.

PSO6: At end semester students have to work in team activity to develop projects related with industry/academia/research problems. Thus they will be able to perform in team activities.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Computer Science)

(Batch 2019-21)

Session 2019-20

Master of Science (Computer Science) Semester - I							
COURSE CODE	**COURSE NAME**	**COURSE TYPE**	**Marks**				**Examination Time (in Hours)**
			Total	**Ext.**		**CA**	
				L	**P**		
MCSL-1111	Advanced Data Structures	C	100	80	-	20	3
MCSL-1112	Advanced Computer Architecture	C	100	80	-	20	3
MCSL-1113	Network Security Practices	C	100	80	-	20	3
MCSL-1114	Discrete Structures	C	100	80	-	20	3
MCSL-1115	Artificial Intelligence	C	100	80	-	20	3
MCSP-1116	Programming Laboratory - I (Based on Advanced Data Structures)	C	100	-	80	20	3
		Total	600				

Note:

C - Compulsory

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Computer Science)
(Batch 2019-21)

Session 2019-20

Master of Science (Computer Science) Semester - II							
COURSE CODE	**COURSE NAME**	**COURSE TYPE**	**Marks**				**Examination Time (in Hours)**
			Total	**Ext.**		**CA**	
				L	**P**		
MCSL-2111	Theory of Computation	C	100	80	-	20	3
MCSL-2112	Image Processing	C	100	80	-	20	3
MCSL-2113	Concept of Core & Advanced Java	C	100	80	-	20	3
MCSL-2114	Cloud Computing	C	100	80	-	20	3
MCSL-2115	Distributed Database Systems	C	100	80	-	20	3
MCSP-2116	Programming Laboratory on Core & Advanced Java	C	100	-	80	20	3
		Total	600				

Note:

C - Compulsory

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Computer Science)
(Batch 2018-20)

Session 2019-20

Master of Science (Computer Science) Semester - III							
COURSE CODE	**COURSE NAME**	**COURSE TYPE**	**Marks**				**Examination Time (in Hours)**
			Total	**Ext.**		**CA**	
				L	**P**		
MCSL-3111	Advanced Software Engineering	C	100	80	-	20	3
MCSL-3112	System Software	C	100	80	-	20	3
MCSL-3113	Data Mining and Warehousing	C	100	80	-	20	3
MCSL-3114	Concept of Core and Advanced Java	C	100	80	-	20	3
MCSL-3115	Network Programming	C	100	80	-	20	3
MCSP-3116	Programming Laboratory - III (Based on Advanced Java and Network Programming)	C	100	-	80	20	3
	Total		600				

Note:

C - Compulsory

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Computer Science)
(Batch 2018-20)

Session 2019-20

Master of Science (Computer Science) Semester IV							
COURSE CODE	**COURSE NAME**	**COURSE TYPE**	**Marks**				**Examination Time (in Hours)**
			Total	**Ext.**		**CA**	
				L	**P**		
MCSL-4111	Advanced Web Technologies	C	100	80	-	20	3
MCSL-4112	Microprocessor and Its Applications	C	100	80	-	20	3
MCSL-4113	Object Oriented Modeling, Analysis and Design	C	100	80	-	20	3
MCSP-4114	Programming Laboratory – IV (Based on Advanced Web Technologies using ASP.NET)	C	100	-	80	20	3
MCSD-4115	Project Work	C	200	-	160	40	6
	Total		600				

Note:

C - Compulsory

Master of Science (Computer Science)(Semester – I)

(Session 2019-20)

ADVANCED DATA STRUCTURES
COURSE CODE:MCSL-1111

Course Outcomes:

After passing this course the student will be able to:

CO1: Design, analyze and implement algorithms and check their performances against specified parameters.

CO2: Understand the necessary mathematical abstraction to solve different data structure problems.

CO3: Devise various algorithms for real world problems involving data structures.

Master of Science (Computer Science)(Semester – I)

(Session 2019-20)

ADVANCED DATA STRUCTURES
COURSE CODE:MCSL-1111

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Review of algorithm analysis, Binary search trees, balanced binary search trees (red-black trees), Btrees, AVL Trees, 2-3 trees, 2-3-4 trees.

UNIT-II

Binary heaps, heap operations, implementation and applications. Priority queue operations, and double-ended, priority queues.

UNIT-III

Binomial heaps, Fibonacci heaps. Data structures for disjoint sets.

Amortized analysis, string matching, and graph algorithms.

UNIT-IV

External data structures - external storage, external files, external sorting searching indexing files, external hashing.

References:

1. *Alfred V. Aho, Jeffrey D. Ulman, John E. Hopcroft, "Data Structures and Algorithms" AddisionWesley, 1983.*
2. Dinesh P. Mehta, I. SartajSahni, "Handbook of Data Structures and Applications", Chapman & Hall/CRC, 2004.

3. Sorenson and Trembley, "An Introduction to Data Structures with Applications, McGraw Hill, 2006 Edition.
4. Peter Brass, "Advanced Data Structure", Cambridge University Press. 2008.
5. A.A.Puntambekar, "Advanced Data Structure", Technical Publications, 2007.

Master of Science (Computer Science)(Semester – I)

(Session 2019-20)

ADVANCED COMPUTER ARCHITECTURE

COURSE CODE: MCSL-1112

Course Outcomes:

After passing this course the student will be able to:

CO1: Have broad knowledge of computer architecture and paradigms of computer system.

CO2: Gain knowledge of parallel computing models and parallel computer structures.

CO3: Understand the concepts of pipelining and multiprocessors.

Master of Science (Computer Science)(Semester – I)

(Session 2019-20)

ADVANCED COMPUTER ARCHITECTURE

COURSE CODE: MCSL-1112

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions ofSections A-D should be set from Units I-IV of the syllabus respectively. Questions may be dividedinto parts(not exceeding four). Candidates are required to attempt five questions, selecting at least onequestion from each section. The fifth question may be attempted from any section.

UNIT-I

Paradigms of Computing: Synchronous – Vector/Array, SIMD, Systolic

Asynchronous – MIMD, reduction Paradigm, Hardware taxonomy: Flynn's classification, Software taxonomy: Kung's taxonomy, SPMD.

UNIT-II

Parallel Computing Models

Parallelism in Uniprocessor Systems: Trends in parallel processing, Basic Uniprocessor Architecture, Parallel Processing Mechanism.

UNIT-III

Parallel Computer Structures: Pipeline Computers, Array Computers, Multiprocessor Systems

Architectural Classification Schemes: Multiplicity of Instruction-Data Streams, Serial versus Parallel Processing, Parallelism versus Pipelining.

UNIT-IV

Pipelining: An overlapped Parallelism, Principles of Linear Pipelining, Classification of Pipeline Processors, General Pipelines and Reservation Tables.

Principles of Designing Pipelined Processors: Instruction Prefetch and Branch Handling, Data Buffering and Busing Structure, Internal Forwarding and Register tagging, Hazard Detection and Resolution.

References:

1. *Computer Architecture and Parallel Processing, Faye A. Briggs, McGraw-Hill International, 2007 Edition.*
2. *Computer Systems Organization & Architecture, John d. Carpinelli, Addison Wesley, 2007 Edition.*
3. *Advanced Computer Architecture - Parallelism, Scalability and Programmability, Kai Hwang, Tata McGraw-Hill Education, 2003.*
4. *Advanced Computer Architectures: A Design Space Approach, T. J. Fountain, DezsoSima , Peter Kacsuk.*

Master of Science (Computer Science)(Semester – I)

(Session 2019-20)

NETWORK SECURITY PRACTICES

COURSE CODE: MCSL-1113

Course Outcomes:

After passing course the student will be able to:

CO1: Understand basics of cryptography, network security, services, mechanisms and defining various terms as vulnerability, threat and attack.

CO2: Identify and classify particular examples of attacks, differentiating between Symmetrical and Asymmetrical cryptography.

CO3: Have understanding of data integrity, authentication, digital signatures and hash functions.

CO4: Understand various network security concepts as IPSec, Web security, PGP, Email security.

Master of Science (Computer Science)(Semester – I)

(Session 2019-20)

NETWORK SECURITY PRACTICES

COURSE CODE: MCSL-1113

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT -I

Introduction: Overview, Security attacks (Interruption, Interception, Modification and Fabrication) and services (confidentiality, authentication, integrity, non–repudiation, access control and availability), types of attacks, model for network security, CAINA Properties.

Classical and Modern Cryptography Techniques: Conventional encryption model, classical encryption techniques, Simplified DES, Principles of Block ciphers, DES and its strength.

UNIT -II

Classical and Modern Cryptography Techniques: Triple DES, Blowfish, CAST – 128, linear and differential cryptanalysis, steganography.

Confidentiality: Traffic confidentiality and random number generation.

Public Key Encryption Methods: Principles, RSA Algorithm, Diffie– Hellman key exchange, Elliptic curve cryptography.

UNIT -III

Hash functions: Applications of Hash Functions, Two Simple Hash Functions, Requirements and Security, SHA.

Message Authentication Codes: Requirements, Functions, Requirements of Message Authentication codes, Security of MACs, MACs based on HMAC, MACs based on Block Ciphers: DAA and CMAC.

Digital Signatures: Basics, Digital signature standard.

UNIT -IV

Key Management and Distribution: Symmetric Key Distribution using Symmetric Encryption, Symmetric Key Distribution using Asymmetric Encryption, X.509 Certificates, Distribution of Public Keys, PKI.

Other Securities:

Transport Level Security: Web Security Considerations.

Electronic Mail security: Pretty Good Privacy.

IP Security: IP Security Overview and Policy, ESP, Combining security Associations.

References:

1. Cryptography and Network Security: Principles and Practice – William Stallings.

2. Introduction to Modern Cryptography by J. Katz and Y. Lindell.

3. Handbook of Applied Cryptography by A. Menezes, P. Van Oorshot, S. Vanstone.

4. Cryptography & Network Security,Behrouz A. Forouzan, 3rd Edition, McGraw-Hill Education.

5. Data Communications and Networking, Behrouz A. Forouzan, 4th Edition, McGraw-Hill Education.

Master of Science (Computer Science)(Semester – I)

(Session 2019-20)

DISCRETE STRUCTURES

COURSE CODE: MCSL-1114

Course Outcomes:

After passing course the student will be able to:

CO1: Develop the quantitative and mathematical skills required for continuous success in the field of Computer Science.

CO2: Understand and construct simple mathematical proofs of important principles like Pigeonhole principle, Inclusion-Exclusion Principle.

CO3: Get familiarize with data structures like Graphs and Trees.

CO4: Understand the basic and elementary counting techniques, factorials and recurrence relations.

Master of Science (Computer Science)(Semester – I)

(Session 2019-20)

DISCRETE STRUCTURES

COURSE CODE: MCSL-1114

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Sets and Functions:
Sets, Relations, Functions, Pigeonhole principle, Inclusion – Exclusion Principle, Equivalence and Partial orderings, Elementary counting techniques, relation of partial order partitions, binary relations.

UNIT-II

Graph Theory:
Definition, Walks, Paths, Directed and Undirected graphs, connected graphs, regular and bipartite graphs, Eulerian chains and cycles. Hamiltonian chains and cycles, planar graphs, Trees and rooted tree, Spanning trees, Chromatic number Connectivity and other graphical parameter application.

UNIT-III

Combinatorial Mathematics:
Basic counting principles Permutations and combinations, Recurrence relations, generating Function, Application.

UNIT-IV

Rings and Boolean algebra: Rings Subrings morphism of rings ideals and quotient rings. Euclidean domains Integral domains and fields Boolean Algebra direct product morphisms Application of Boolean algebra in logic circuits and switching functions.

References:

1. Ehrig, H., Mahr, B. Fundamentals of Algebraic Specification I, EATCS Monographs on Theory. Comp. Sc. Vol. 6 spinger, Berlin 1985.
2. Gersting J. Mathematical Structures for Computer Science, W.H. Freman, New York, 1987.
3. Gibons, A. Algorithmic Graph theory Cambridge University Press, 1985.

4. Knuth, D.E. The art of Computer Programming Vol. I: Fundamental Algorithms. 2nd ed. Reading, Mas, Adison Wesley 1973.
5. Kolman B. Busby R. Discrete Mathematical Structures for Computer Science, Prentice Hall EnglewodClifs. 1987.
6. Sahni, S. Concepts in Discrete Mathematics Fridley MN., Camelot Publ. Comp., 1981.
7. Schmidt G. Strohlein T. Relations Graphs Program, EATS Monograph on Theor.Comp.Sc.Vol.29 Berlin Spinger 1993.
8. Wheler W. Universal Algebra for Computer Scientist EATCS Monographs on Theor.Comp.Sc.Vol.25 Spinger-Verlag, Berlin 191.

Master of Science (Computer Science)(Semester – I)

(Session 2019-20)

ARTIFICIAL INTELLIGENCE

COURSE CODE: MCSL-1115

Course Outcomes:

After passing course the student will be able to:

CO1: Understand various search strategies used in AI for finding solution to a problem.

CO2: Gain knowledge of propositional and predicate logic.

CO3: Represent planning in AI in different scenarios.

CO4: Understand basics of fuzzy logic, learning in AI and neural network.

Master of Science (Computer Science)(Semester – I)

(Session 2019-20)

ARTIFICIAL INTELLIGENCE

COURSE CODE: MCSL-1115

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction- What is intelligence, Foundations of Artificial Intelligence (AI). History of AI Problem Solving- Formulating problems, problem types, states and operators, state space, search strategies.

Uninformed Search Strategies – BFS, DFS, UCS, Depth Limited Search, Iterative Deepening Search, Bi-directional Search. Informed Search Strategies- Best first search, A* algorithm, heuristic functions, Iterative deepening A*(IDA), small memory A*(SMA*).

UNIT-II

Game playing - Perfect decision game, Imperfect decision game, Evaluation function, Alpha-Beta Pruning.

Reasoning- Representation, Inference, Propositional Logic, Predicate Logic (First Order Logic), logical reasoning, forward chaining, backward chaining.

UNIT-III

Planning- Basic representation of plans, partial order planning, planning in the blocks world, Hierarchical planning, Conditional planning, representation of resource constraints, measures, temporal constraints.

Uncertainty - Basic probability, Baye's rule, Belief networks, Default reasoning, Fuzzy sets and Fuzzy logic.

UNIT-IV

Inductive Learning - decision trees, rule based learning, current-best-hypothesis search, least commitment search, neural networks, reinforcement learning, genetic algorithms, Other learning methods - Neural Networks, Re-inforcement learning, Genetic algorithms, Communication among agents.

References:

1. Stuart Russell and Peter Norvig. Artificial Intelligence – A Modern Approach, Pearson Education Press, 2001.

2. Kevin Knight, Elaine Rich, B. Nair, Artificial Intelligence, McGraw Hill, 2008.

3. George F. Luger, Artificial Intelligence, Pearson Education, 2001.

4. Nils J. Nilsson, Artificial Intelligence: A New Synthesis, Morgan Kauffman, 2002.

Master of Science (Computer Science)(Semester – I)

(Session 2019-20)

PROGRAMMING LABORATORY – I

COURSE CODE:MCSP-1116

Max. Marks: 100
Practical : 80
CA: 20

Examination Time: 3 Hrs

Pass % = 40%

Programs based on Advanced Data Structures using C/C++

Master of Science (Computer Science)(Semester – II)

(Session 2019-20)

THEORY OF COMPUTATION

COURSE CODE:MCSL-2111

Course Outcomes:

After passing this course the student will be able to:

CO1: Design finite automata, write Regular expressions, prove non- regularity of a Language using pumping lemma theorem.

CO2: Understand regular languages and its properties.

CO3: Define production rules for Context Free Grammar (CFG), Convert CFG into Chomsky Hierarchy.

CO4: Construct high computing machines viz, push down automata, Turingmachine, parsingtableforLL(K) and LR(K) grammar.

CO5: Understand problem of undecidibility and derivation languages.

Master of Science (Computer Science)(Semester – II)

(Session 2019-20)

THEORY OF COMPUTATION

COURSE CODE:MCSL-2111

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs

Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Chomsky Hierarchy, regular expressions, Operations on Regular Sets, Regular grammars, Linear Grammar, equivalence of Regular Grammars, properties of regular languages, pumping lemma, Closure properties.

UNIT-II

Finite Automata – DFA, transition graphs, non-deterministic FA, equivalence of DFA and NDFA, Minimization of NFA, ε-NFA and its conversion into NFA, Mealy and Moore Machines.

Context Free Languages – Leftmost and rightmost derivation, parsing and ambiguity, Chomsky normal form, Greibach Normal form.

UNIT-III

Pushdown Automata – NDPDA, DPDA, context free languages and PDA, comparison ofdeterministic and non-deterministic versions, closure properties, pumping lemma for CFL

Context Sensitive Languages, Variations, Linear Bounded Automata, Closure Properties, The Kuroda Normal Form, One sided Context Sensitive Grammars.

UNIT-IV

Turing Machines, variations, halting problem, Post Correspondence Problem (PCP)

Properties of LL(k) and LR(k) grammars, Decidability, Recursive and RecursivelyEnumerable Languages, Closure properties.

References:

1. K.L.P. Mishra and N. Chandrasekaran, "Theory of Computer Science, Third Edition", PHILearning Private Limited, 2011.

2. John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, "Introduction to Automata Theory",Languages and Computation, Pearson Education.

3. M. Sipser, "Introduction to the Theory of Computation", Second Edition, Cengage Learning.

4. K. V. N. Sunitha , N. Kalyani, "Formal Languages and Automata Theory", McGraw-Hill, 2010.

5. Stephen Wolfram, "Theory and Applications of Cellular Automata", World Scientific, 1986.

6. G.E. Revesz, "Introduction to Formal Languages", Dover Publications, 1991.

7. M. A. Harrison, "Introduction to Formal Language Theory", Addison-Wesley, 1978.

8. R.K. Shukla," Theory of Computation", Cengage Learning.

9. An Introduction to Formal Languages and Automata, by Peter Linz, Third Edition, Narosa Publishers, 1998.

Master of Science (Computer Science)(Semester – II)

(Session 2019-20)

IMAGE PROCESSING

COURSE CODE:MCSL-2112

Course Outcomes:

After passing this course the student will be able to:

CO1: Learn the fundamental concepts of Digital Image Processing and basic image processing operations.

CO2: Understand image analysis algorithms.

CO3: Know about current applications in the field of digital image processing.

Master of Science (Computer Science)(Semester – II)

(Session 2019-20)

IMAGE PROCESSING

COURSE CODE:MCSL-2112

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs

Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Background: Introduction to electronic systems for image transmission and storage, computer processing and recognition of pictorial data, overview of practical applications.

UNIT-II

Fundamentals: Mathematical and perceptual preliminaries, human visual system model, image signal representation, imaging system specification building image quality, role of computers, image data formats.

UNIT-III

Image Processing Techniques: Image enhancement, image restoration, image data compression and statistical pattern recognition.

Applications of Image Processing: Picture data archival, machine vision, medical image processing.

UNIT-IV

Techniques of Colour Image Processing: Colour image signal representation, colour system transformations, extension of processing techniques to colour domain.

References:

1. Pratt, W.K. Digital Image Processing, John Wiley, N.Y./1978.
2. Rosenfield, A and Kak, A.C., Picture processing, Academic Press N.Y., 1982.

3. Jain, A.K., Fundamentals of Digital Image Processing, Englewood Cliffs, Prentice Hall, 1989.
4. Chris Soloman, Stuart Gibson, Fundamentals of Digital Image Processing: A PracticalApproach using MatLab, John Wiley and Sons, 2007.
5. Digital Image Processing by Gonzalez & Wood, Addison Wesley, 2000.

Master of Science (Computer Science)(Semester – II)

(Session 2019-20)

CONCEPT OF CORE AND ADVANCED JAVA

COURSE CODE: MCSL-2113

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the basic fundamentals of Java programming.

CO2: Gain knowledge of object oriented concepts to model real world problems.

CO3: Have knowledge of packages, multithreading, File handling and Exception handling.

CO4: Demonstrate the concept of Applets, Swings and Events.

Master of Science (Computer Science)(Semester – II)

(Session 2019-20)

CONCEPT OF CORE AND ADVANCED JAVA

COURSE CODE: MCSL-2113

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Java Fundamentals: Features, Objects Oriented Basis, Java Virtual Machine, Character Set, Operators, Data Types, Control Structures

UNIT-II

Classes, Inheritance, Polymorphism, Packages & Interfaces, Stream IO Classes, Exception, Handling.

UNIT-III

Multithreading: Java Thread model, Thread Priorities, Synchronization, Interthread communication, Suspending, resuming & stopping thread.

Applet: Applet basics, Applet architecture, Applet: Display, Repaint, Parameter Passing.

UNIT-IV

Swings – Window Fundamentals, Working with JFrame Windows, Graphics, Controls, Colour and Fonts.

Events Handling - The Delegation Event Model, Event Classes, Event Listener Interfaces.

References:

1. Complete Reference: Java, HerbetSchildt&Naughton, Tata Mc Graw, 5th Edition, 2006.
2. Java Unleashed, Jane Jawoske, SAM5, Tech Me dia 2006.
3. Java 8 Programming Black Book, D.T. Editorial Services, 2015.
4. Programming with Java – A Primer, Balagurusamy,McGraw Hill Education, 2017.
5. Head First Java , Kathy Sierra and Bert Bates , 2nd Edition,O'Reilly Publications.

6. Java – A Beginner's Guide, Herbert Schildt, Seventh Edition, Oracle Press.

Master of Science (Computer Science)(Semester – II)

(Session 2019-20)

CLOUD COMPUTING

COURSE CODE:MCSL – 2114

Course Outcomes:

After passing this course the student will be able to:

CO1: Articulate the main concepts, key technologies, strengths and limitations of Cloud computing.

CO2: Identify the architecture and infrastructure of various Cloud services and deployment models.

CO3: Explain the main issues related with Cloud computing and approaches corresponding to the solution of these issues.

CO4: Provide the prevalent solution corresponding to Cloud computing application.

CO5: Produce new ideas and innovations in the field of Cloud computing.

Master of Science (Computer Science)(Semester – II)

(Session 2019-20)

CLOUD COMPUTING

COURSE CODE:MCSL – 2114

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs

Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction: Definition, Vision, Reference Model, Benefits, Limitations, Terminology, Open Challenges.

Virtualization: Definition, Type of Virtualization, Benefits, Limitations, Virtualization and Cloud, Virtual Appliance.

UNIT-II

Cloud Computing Architecture: Service Models, Deployment Models, Cloud Entities, Cloud Clients, Service Level Agreement (SLA) and Quality of Service (QoS) in Cloud Computing.

UNIT-III

Programming Models in Cloud: Thread Programming, Task Programming and Map–Reduce Programming.

Cloud Security: Infrastructure Security, Data Security, Identity and Access Management, Privacy Management, Security as a Service on Cloud.

UNIT-IV

Advance Topic in Cloud: Energy Efficiency in cloud, Market Oriented Cloud Computing, Big– Data Analytics, Federated Cloud Computing.

Reference:

1. RajkumarBuyya, Christian Vecchiola and ThamaraiSelvi, Mastering Cloud Computing: Foundation and Application Programming, Tata McGraw Hill, ISBN–13: 978–1–25–902995–0, New Delhi, India, Feb 2013.

2. Tim Mather, SubraKumaraswamy, ShahedLatif, Cloud Security and Privacy, O'Reilly,ISBN–13: 978–8–18–404815–5.

3. Barrie Sosinsky, Cloud Computing Bible, Wiley India Pvt. Ltd., ISBN–13: 978–8–12–652980–3, New Delhi, India, 2011.

4. Dr. Saurabh Kumar, Cloud Computing: Insights Into New–Era Infrastructure, Wiley India Pvt. Ltd, ISBN–13: 978–8–12–652883–7, New Delhi, India, 2011.

5. Fern Halper, Hurwitz, Robin Bloor, Marcia Kaufman, Cloud Computing for Dummies, Wiley India Pvt. Ltd, ISBN–13: 978–0–47–059742–2, New Delhi, India, 2011.

Master of Science (Computer Science)(Semester – II)

(Session 2019-20)

DISTRIBUTED DATABASE SYSTEMS

COURSE CODE:MCSL-2115

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the basic concepts of distributed databases homogeneous/heterogeneous distributed database and distribution transparency.

CO2: Design distributed database by demonstrating the meaning of data fragmentation, various methods of data fragmentation and data allocation strategies.

CO3: Translate global queries into fragment queries by following different equivalence transformation rules for queries.

CO4: Solve query optimization problem.

CO5: Understand the management of distributed transaction, concurrency control mechanisms and reliability protocols.

CO6: Understand distributed database administration, protection and security schemes.

Master of Science (Computer Science)(Semester – II)

(Session 2019-20)

DISTRIBUTED DATABASE SYSTEMS

COURSE CODE:MCSL-2115

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs

Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction to distributed databases, comparison of distributed and centralized systems,DDBMS, global relations, fragment and physical image, types of schemas, methods of fragmentation of a relation, levels of transparency in a distributed system, integrity constraints.

UNIT-II

Representation of database operation in form of a query, operation in form of a query, operations on a query, unary and binary tree in a query, converting a global query into fragment query, join and union operations involving a query, aggregate functions, and parametric queries.

UNIT-III

Introduction to query optimization, estimation of profiles of algebraic operations, optimization graphs, reduction of relation using semi-join and join operation.

Properties and goals of transaction management, distributed transactions, recovery mechanism in case of transaction failures, log based recovery, check pointing, and communication and site failures in case of a transaction and methods to handle them, serializability and timestamp in distributed databases.

UNIT-IV

Introduction to distributed deadlocks, local and global wait for graphs, deadlock detection using centralized and hierarchical controllers, prevention of deadlocks, 2 and 3 phase locking

and commitment protocols, reliability in commitment and locking protocols, reliability and concurrency control, reliability and removal of inconsistency.

Distributed database administration, authorization and protection in distributed databases, distributed database design, heterogeneous database system.

References:

1. Distributed Databases Principles and Systems by Stefano Ceri and GuiseppePelagatti, McGraw-Hill International Editions, 2004.

2. Distributed Database Systems by David Bell, JameGrimson, Addison-Wesley, 1992.

3. M.TamerOzsu, Patrick Valdureiz, 'Principles of Distributed Database Systems' Second Edition, Prentice Hall, 2002.

4. RomezElmasri, ShamkantB.Navathe, 'Fundamentals of Database Systems' Pearson Education, 2005.

5. Silberschatz, Korth, Sudershan "Database System Concepts" 4th Ed. McGraw Hill, 2006.

6. *Connolly &Begg "Database Systems – A practical approach to Design, Implementation and Management, 3rd Ed. Pearson Education, 2005.*

Master of Science (Computer Science)(Semester – II)

(Session 2019-20)

PROGRAMMING LABORATORY ON CORE & ADVANCED JAVA

COURSE CODE:MCSP-2116

Max. Marks: 100
Practical: 80
CA: 20

Examination Time: 3 Hrs

Pass % = 40%

Implementations based on Java Programming.

Master of Science (Computer Science)(Semester – III)

(Session 2019-20)

ADVANCED SOFTWARE ENGINEERING

COURSE CODE: MCSL-3111

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the process of software project planning and management.

CO2: Gain knowledge of software Re-use and Re-engineering.

CO3: Gain knowledge of Object Oriented Analysis, Design and Object Oriented Metrics.

Master of Science (Computer Science)(Semester – III)

(Session 2019-20)

ADVANCED SOFTWARE ENGINEERING

COURSE CODE: MCSL-3111

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Software Project Management: Fundamentals of Software project planning , Conventional Software Management, Evolution of Software Economics, Improvement of Software Economics, Comparison of old and modern ways of Software Management.

UNIT II

Software Re-engineering: Introduction Re-engineering, Restructuring and Reverse Engineering, Re-engineering existing systems, Data Re-engineering and migration, Software Reuse and Re-engineering.

UNIT III

Object-Oriented (OO) Measurements: Introduction, Why metrics ?, Classification of OO metrics, Study of Design Metrics- method size, method internals, class size, class inheritance, Method inheritance, class intervals and class externals.

UNIT IV

Object-Oriented Analysis and Design: What is Object-Oriented Design?, Object, Abstraction, Collaboration among Objects, Polymorphism, Classes, specifying State, Specifying Behaviour, Class Relationships, Grouping, Hiding.

Software Agents: Definition, Applications, Types and Classes, Multi-Agent systems, characteristics & Properties Agents.

References:

1. Software project management, Walker Royce, Pearson Education Inc.
2. Software Re-engineering, Robert S. Arnold IEEE Comp. Society.

3. Object Oriented Software Metrics, Lorenz and Kidd.
4. Object-Oriented Analysis and Design, Booch.

Master of Science (Computer Science)(Semester – III)

(Session 2019-20)

SYSTEM SOFTWARE

COURSE CODE: MCSL-3112

Course Outcomes:

After passing this course the student will be able to:

CO1: Study and analyze various components of system software like translators, loaders, interpreters, compilers, assemblers etc.

CO2: Understand different system software like OS, DBMS, text editors etc.

CO3: Target various applications areas of system software.

Master of Science (Computer Science)(Semester – III)

(Session 2019-20)

SYSTEM SOFTWARE

COURSE CODE: MCSL-3112

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Introduction to System Software: Evolution of System Software, components of system software, Translators, loaders, interpreters, compiler, assemblers.

UNIT II

Assemblers: Overview of assembly process, design of one pass and two assemblers. Macroprocessors: Macro definition and expansion, concatenation of macro parameters, generations of unique labels, conditional macro expansion, Recursive macro expansion.

UNIT III

Compilers: Phases of compilation process, logical analysis, parsing, storage management optimisation. Incremental compilers, cross compilers, P code compilers.

UNIT IV

Loaders and Linkage Editors: Basic loader functions. Relocation, program linking, linkage, editors, dynamic linking bootstrap loaders.

Other System Software: Operating system, DBMS, text editors, Interactive debugging systems.

References:

1. Leland L. Beck: System Software, An introduction to system programming, Addison Wesley.
2. D.M. Dhamdhere: Introduction to System Software, Tata McGraw Hill.
3. D.M. Dhamdhere: System Software and Operating System, Tata McGraw Hill, 1992.
4. Madrich, Stuarte: Operating Systems, McGraw Hill, 1974.

5. Stern Nancy Assembler Language Programming for IBM and IBM compatible computers, John Wiley, 1991.

Master of Science (Computer Science)(Semester – III)

(Session 2019-20)

DATA MINING AND WAREHOUSING

COURSE CODE: MCSL-3113

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand basic concepts and need of data mining and warehousing.

CO2: Study and analyze architecture of data warehouse and various servers that support data warehousing.

CO3: Study practical implementation of data warehousing and mining.

CO4: Target various applications areas of both the technologies.

Master of Science (Computer Science)(Semester – III)

(Session 2019-20)

DATA MINING AND WAREHOUSING

COURSE CODE: MCSL-3113

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Concepts of Data Warehousing, Difference between operational database systems and Data warehousing, Need of a separate Data Warehouse. Multidimensional Data Model.

UNIT II

Data Warehousing Architecture: Steps for Design and Construction of Data-Warehouses, Three-Tier Data Warehouse Architecture, Characteristics of Data Warehousing Data, Data Marts, Types of OLAP Servers: ROLAP, MOLAP, HOLAP; Difference between Online Transaction Processing and Online Analytical Processing.

UNIT III

Data Warehouse Implementation: Efficient Computation of Data Cubes, Indexing OLAP Data, Efficient Processing of OLAP Queries, Metadata Repository, Data Warehouse Back-End Tools and Utilities.

UNIT IV

Data Mining: Basic Concepts, Data Mining Techniques: Predictive Modeling, Database Segmentation, Link Analysis, Deviation, Detection in details. Data Mining Query Languages, Applications and Trends in Data Mining.

References:

1. Han, Kamber "Data Mining: Concepts and Techniques" Morgan Kaufmann.
2. RomezElmasri, ShamkantB.Navathe, "Fundamentals of Database Systems" Pearson Education.
3. Silberschatz, Korth, Sudershan "Database System Concepts" 4th Ed. McGraw Hill

4. Connolly &Begg "Database Systems – A Practical Approach to Design, Implementation and Management", 3rd Ed., Pearson Education.

Master of Science (Computer Science)(Semester – III)

(Session 2019-20)

CONCEPT OF CORE AND ADVANCED JAVA

COURSE CODE: MCSL-3114

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the basic fundamentals of Java programming.

CO2: Gain knowledge of object oriented concepts to model real world problems.

CO3: Have knowledge of packages, multithreading, File handling and Exception handling.

CO4: Demonstrate the concept of Applets, Swings and Events.

Master of Science (Computer Science)(Semester – III)

(Session 2019-20)

CONCEPT OF CORE AND ADVANCED JAVA

COURSE CODE: MCSL-3114

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Java Fundamentals: Features, Objects Oriented Basis, Java Virtual Machine, Character Set, Operators, Data Types, Control Structures

UNIT-II

Classes, Inheritance, Polymorphism, Packages & Interfaces, Stream IO Classes, Exception, Handling.

UNIT-III

Multithreading: Java Thread model, Thread Priorities, Synchronization, Interthread communication, Suspending, resuming & stopping thread.

Applet: Applet basics, Applet architecture, Applet: Display, Repaint, Parameter Passing.

UNIT-IV

Swings – Window Fundamentals, Working with JFrame Windows, Graphics, Controls, Colour and Fonts.

Events Handling - The Delegation Event Model, Event Classes, Event Listener Interfaces.

References:

1. Complete Reference: Java, HerbetSchildt&Naughton, Tata Mc Graw, 5Th Edition, 2006.
2. Java Unleashed, Jane Jawoske, SAM5, Tech Me dia 2006.
3. Java 8 Programming Black Book, D.T. Editorial Services, 2015.
4. Programming with Java – A Primer, Balagurusamy,McGraw Hill Education, 2017.
5. Head First Java , Kathy Sierra and Bert Bates , 2nd Edition, O'Reilly Publications.

6. Java – *A Beginner's Guide, Herbert Schildt, Seventh Edition, Oracle Press*.

Master of Science (Computer Science)(Semester – III)

(Session 2019-20)

NETWORK PROGRAMMING

COURSE CODE: MCSL-3115

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand basic and advanced concepts of network programming.

CO2: Have detailed knowledge of various protocols like TCP, UDP, etc.

CO3: Have detailed understanding of socket programming and related issues.

CO4: Get an introduction of advanced IP protocols like IP4 and IP6.

Master of Science (Computer Science)(Semester – III)

(Session 2019-20)

NETWORK PROGRAMMING

COURSE CODE: MCSL-3115

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Sockets and Socket Address structures, Concept of Zombies, Daemon Processes, Super servers, Concurrent versus Iterative servers, Protocol Independence, Error Handling : Wrapper functions, OSI Model, Unix standards.

UNIT-II

TCP Connection establishment & Termination, Port Numbers and Concurrent Servers, Protocol Usage by common Internet Applications.

UDP Communication Semantics, UDP Echo Server, Echo Client working, Protocol Usage by Common Internet Applications.

UNIT-III

Sockets Address Structures, Byte ordering & Manipulation Functions, TCP Socket System Calls, TCP Client-Server E.g., I/O Multiplexing, Signal Handling in Concurrent Servers.

UNIT-IV

Socket Options, Elementary Names Address Conversions, Ipv4 and Ipv6 Interoperability.

References:

1. Networking Programming, W. Richard Stevens, Pearson Education.
2. Advanced Programming in UNIX Environment, W. Richard Stevens, Pearson Education.
3. Data Communications and Networking, Behrouz A. Forouzan, 4th Edition, McGraw-Hill Education.

Master of Science (Computer Science)(Semester – III)

(Session 2019-20)

PROGRAMMING LABORATORY – III

COURSE CODE: MCSP-3116

Max. Marks: 100
Practical: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Programming Laboratory based on Advanced Java and Network Programming

Master of Science (Computer Science)(Semester – IV)

(Session 2019-20)

ADVANCED WEB TECHNOLOGIES

COURSE CODE: MCSL-4111

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand fundamental concepts and theories of web designing using ASP.NET.

CO2: Study and analyze practical uses of different controls of ASP.NET.

CO3: Establish and study dynamic relationship of the language with standard databases.

CO4: Work on other core issues of website like cookies, caching and dependencies.

Master of Science (Computer Science)(Semester – IV)

(Session 2019-20)

ADVANCED WEB TECHNOLOGIES

COURSE CODE: MCSL-4111

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Fundamentals of Web Development: Introduction to HTML, CSS, JAVA SCRIPT (Client side scripting), Server Site Development using PHP and ASP.NET.

Standard Controls: Display information, Accepting user input, Submitting form data, Displaying images, Using the panel control, Using the hyperlink control.

Validation Controls: Using the required field validator control, using the range validator control using the compare validator control, using the regular expression validator control, Using the custom validator control, Using the validation summary controls.

UNIT-II

Rich Controls: Accepting file uploads, Displaying a calendar, Displaying advertisement, Displaying different page views, Displaying a wizard.

Designing Website with Master Pages: Creating master pages, Modifying master page content, Loading master page dynamically.

SQL Data Source Control: Creating database connections, Executing database commands, Using ASP.NET parameters with the SQL data source controls, Programmatically executing SQL data source commands, Cashing database data with the SQL data Source controls.

UNIT-III

List Controls: Dropdown list control, Radio button list controls, list box controls, bulleted list controls, custom list controls.

Grid View Controls: Grid view control fundamentals, Using field with the grid view control, Working with grid view control events extending the grid view control.

UNIT-IV

Building Data Access Components with ADO.NET: Connected the data access, Disconnected data access, Executing a synchronous database commands, Building data base objects with the .NET framework.

Maintaining Application State: Using browser cookies, Using session state, Using profiles.

Caching Application Pages and Data: page output caching, partial page caching, data source caching, data caching, SQL cache dependences.

Reference:

1. ASP.NET 3.5: Stephen Walther, Pearson Education, 2005.
2. ASP.NET: The Complete Reference, Matthew MacDonald, McGraw-Hill/Osborne, 2002.
3. Beginning ASP.NET 3.5, ImarSpaanjaars, John Wiley & Sons, 2008.
4. Professional ASP.NET Design Patterns, Scott Millett, Wiley, 2010.
5. Programming Microsoft® ADO.NET 2.0 Applications: Advanced Topics, Glenn Johnson, WP Publishers & Distributors Pvt Limited, 2005.

Master of Science (Computer Science)(Semester – IV)

(Session 2019-20)

MICROPROCESSOR AND ITS APPLICATIONS

COURSE CODE: MCSL-4112

Course Outcomes:

After passing this course the student will be able to:

CO1: Have basic understanding of architecture of 8086 and 8088 microprocessors.

CO2: Understand the working of 8086/8088 microprocessor for minimum and maximum mode.

CO3: Gain knowledge of Memory and I/O interfaces of 8086/8088 microprocessor.

Master of Science (Computer Science)(Semester – IV)

(Session 2019-20)

MICROPROCESSOR AND ITS APPLICATIONS

COURSE CODE: MCSL-4112

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction: Introduction to Microprocessor, General Architecture of Microcomputer System. Microprocessor Units, Input unit, Output unit, Memory unit and auxiliary storage unit.

UNIT-II

Architecture of 8086/8088 Microprocessor: Description of various pins, configuring the 8086/8088 microprocessor for minimum and maximum mode systems, Internal architecture of the 8086/8088 microprocessor, system clock, Bus cycle, Instruction execution sequence.

UNIT-III

Memory Interface of 8086/8088 Microprocessor: Address space and data organization, generating memory addresses hardware organization of memory address space, memory bus status code, memory control signals, read/write bus cycles, program and data storage memory, dynamic RAM system.

UNIT-IV

Input/Output Interface of the 8086/8088 Microprocessor: I/O interface, I/O address space and data transfer, I/O instructions, I/O bus cycles, Output ports, 8255A Programmable Peripheral Interface (PPI), Serial communication interface (USART and UART) – the RS- 232 C interface.

Interrupt Interface of 8086/8088 Microprocessor, Types of Interrupt, Interrupt Vector Table (IVT).

References:

1. Walter Triebel: The 8086 Microprocessor – Architecture, Software and Interfacing Techniques, PHI, Delhi.

2. Walter Triebel: The 8088 Microprocessor – Architecture, Software and Interfacing Techniques, PHI, Delhi.

3. Douglas V. Hall: Microprocessors and Interfacing – Programming and Hardware, Tata McGraw Hill Publishing Company Ltd., New Delhi.

4. Peter Abel: IBM PC Assembly Language and Programming, PHI, Delhi.

Master of Science (Computer Science)(Semester – IV)

(Session 2019-20)

OBJECT ORIENTED MODELING, ANALYSIS AND DESIGN

COURSE CODE: MCSL-4113

Course Outcomes:

After passing this course the student will be able to:

CO1: Introduce Object Oriented Methodology (OOM) using object, class, generalization and aggregation.

CO2: Understand Object Meta Modeling and Functional Modeling.

CO3: Gain knowledge of System Analysis and Design through various models.

Master of Science (Computer Science)(Semester – IV)

(Session 2019-20)

OBJECT ORIENTED MODELING, ANALYSIS AND DESIGN

COURSE CODE: MCSL-4113

Max. Marks: 100
Theory: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Object Orientation, OMT Methodology, Object and Class, Link and Association Generalization, Aggregation Multiple Inheritance, Packages.

UNIT-II

Object Meta Modeling, Metadata and Metamodels, Functional Modeling Pseudocode with the Object navigation Notation, ONN Constructs, Combining ONN Constructs.

UNIT-III

Analysis: Object Model, Data Dictionary, Dynamic Model, Functional Model.

UNIT-IV

System Design: - Devising an Architecture, Database Management Paradigm, Object Model, Elaborating the functional Model, Evaluating the Quality of Design Model.

Reference:

1. *Object Oriented Modeling and Design By Michael Blaha and William Premerlani, Prentice Hall.*
2. *Head First Object-Oriented Analysis and Design: A Brain Friendly Guide to OOA&D, Brett McLaughlin, Shroff Publishers & Distributors, 2006.*
3. *Object-Oriented Analysis and Design: Understanding System Development with UML 2.0, Mike O'Docherty, John Wiley & Sons, 2005.*
4. *Object-oriented analysis and design, James Martin, Prentice-Hall, 1993.*
5. *Object-oriented analysis, Peter Coad, Yourdon Press, 1991.*
6. *Object-Oriented Analysis and Design, Brahma Dathan and SarnathRamnath, Springer, 2015.*

7. *Head First Design Patterns, Elisabeth Freeman and Kathy Sierra, "O'Reilly Media, Inc., 2004.*

Master of Science (Computer Science)(Semester – IV)

(Session 2019-20)

PROGRAMMING LABORATORY – IV

(BASED ON ADVANCED WEB TECHNOLOGIES USING ASP.NET)

COURSE CODE: MCSP-4114

Max. Marks: 100
Practical: 80
CA: 20

Examination Time: 3 Hrs. Pass % = 40%

Lab Based on Advanced Web Technologies using ASP.NET

Master of Science (Computer Science)(Semester – IV)

(Session 2019-20)

PROJECT WORK

COURSE CODE: MCSD-4115

Max. Marks: 200
Practical: 160
CA: 40

Examination Examination
Time:6 Hrs.

Pass % = 40%

1. Candidates have to submit only one hard copy and CD of documentation which shall be kept with the course supervisor/guide in the college only. Further, supervisor/guide OR principal of college shall forward two copies of DVD (Digital Versatile Disk) containing all the documentation files of the students (file name to be saved as Rollno_of_the_ student.pdf) to the concerned branch of the University. Covering letter (duly signed by the principal/Head of the college/institute) should contain the following information. Candidate name, Candidate Roll no, Project Title of the student and .pdf file name of his project documentation.

2. The assignment shall be evaluated by a board of three examiner (two (02) External examiners and one (01) internal examiner) as approved by the BOS.

3. The Project is to be submitted as per the common ordinances for P.G. courses under semester system.