FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

Master of Science (Computer Science)
(Semester I-IV)

(Under Credit Based Continuous Evaluation Grading System)

Session: 2022-23
Batch: 2022-24

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR (Autonomous)

Program Specific Outcomes

Master of Science (Computer Science)

(Session 2022-23)

After completing this programme, the students will be able to:

PSO1: Showcase their skillset to apply in the field of IT, academics and other competitive examinations.

PSO2: Comprehend the implementation logic behind the architecture of computers.

PSO3: Apply skills to provide IT based solutions for real world problems through development of software and websites.

PSO4: Contextualize and analyse the problems in hand to work for an IT based solution.

PSO4: Apply principles and techniques from the selective areas to develop special expertise.

Master of Science (Computer Science) Semester – I

(Session 2022-23)
COURSE CODE: MCSL-1111
ADVANCED DATA STRUCTURES

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: Comprehend and implement operations on heaps and queue.
CO3: Understand the necessary mathematical abstraction to solve different data structure problems.
CO4: Implement various searching, sorting and hashing algorithms.

Master of Science (Computer Science) Semester – I

(Session 2022-23)

COURSE CODE: MCSL-1112
ADVANCED COMPUTER ARCHITECTURE

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend paradigms and various kind of classifications of computing.

CO2: Gain knowledge of parallel computing models.

CO3: comprehend various architectural classifications of computers on the basis of data processing schemes.

CO4: Analyse pipelined architecture against parameters like throughput, speedup, efficiency, etc.

Master of Science (Computer Science) Semester – I

(Session 2022-23)

COURSE CODE: MCSL-1113
NETWORK SECURITY PRACTICES

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: Comprehend the application of various private and public cryptography techniques.

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 2022-23)

COURSE CODE: MCSL - 1114
DISCRETE STRUCTURES

Course Outcomes:

After passing course the student will be able to:

CO1: Understand and construct simple mathematical proofs of important principles like Pigeonhole principle, Inclusion-Exclusion Principle.
CO2: Comprehend advanced data structures like Graphs and Trees along with their associated operations.
CO3: Apply skills to solve problems on elementary counting techniques, factorials and recurrence relations.
CO4: Comprehend various combinatorial structures and Boolean Algebra.

Master of Science (Computer Science) Semester – I

(Session 2022-23)

COURSE CODE: MCSL-1115
ARTIFICIAL INTELLIGENCE

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 – II

(Session 2022-23)
COURSE CODE: MCSL-2111
THEORY OF COMPUTATION

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend various grammars in Chomsky hierarchy and their closure properties.
CO2: Define production rules for Context Free Grammar (CFG), Convert CFG into Chomsky and Greibach Normal Form.
CO3: Apply Pumping Lemma to find to identify membership of a language.
CO4: Construct computing machines like Finite Automata, Pushdown Automata, Turing machine, etc.

Master of Science (Computer Science) Semester – II

(Session 2022-23)

COURSE CODE: MCSL-2112

IMAGE PROCESSING

Course Outcomes:

After passing this course the student will be able to:

CO1: Identify current applications in the field of digital image processing along with its basics.
CO2: Comprehend fundamental concepts of Digital Image Processing like human visual system model, image signal representation, imaging system specification
CO3: Identify basic image processing operations.
CO4: Comprehend various colour models and colour image processing techniques.

Master of Science (Computer Science) Semester – II

(Session 2022-23)

COURSE CODE: MCSL-2113
ADVANED PROGRAMMING CONCEPTS

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend fundamentals of Java programming.
CO2: Apply OOPs concepts to model real world problems for its simplified implementation.
CO3: Identify the utilization of Applets and multithreading.
CO4: Work with Graphical User Interface through Swings and Event handling.

Master of Science (Computer Science) Semester – II

(Session 2022-23)

COURSE CODE: MCSL – 2114

CLOUD COMPUTING

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: Identify the application of programming and security model in cloud computing.
CO4: Comprehend various advance topics in the field of cloud computing.

Master of Science (Computer Science) Semester – II

(Session 2022-23)
COURSE CODE: MCSL-2115
DISTRIBUTED DATABASE SYSTEMS

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend different kind of distributed databases, data fragmentation and involved transparencies.
CO2: Translate global queries into fragment queries by following different equivalence transformation rules for queries.
CO3: Comprehend query optimization along with management of distributed transaction and recovery mechanisms.
CO4: Identify deadlock situations along with application of concurrency control and reliability mechanisms to prevent deadlocks.

Master of Science (Computer Science) Semester – III

(Session 2023-24)

COURSE CODE: MCSL- 3111
DATA MINING AND DATA WAREHOUSING

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the basic concepts, need of data mining and procedure for data pre-processing.
CO2: Analyse architecture of data warehouse.
CO3: Comprehend various data mining and clustering techniques.
CO4: Identify various applications areas, trends and challenges of data mining.

Master of Science (Computer Science) Semester – III

(Session 2023-24)

COURSE CODE: MCSL-3112

SYSTEM SOFTWARE

Course Outcomes:

After passing this course the student will be able to:

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

CO2: Apply macros for making the assembly level program modular.

CO3: Analyse the working of different phases of compiler.

CO4: Comprehend different system software like OS, DBMS, text editors etc.

Master of Science (Computer Science) Semester – III

(Session 2023-24)

COURSE CODE: MCSL-3113
ADVANCED WEB TECHNOLOGIES

Course Outcomes:

After passing this course the student will be able to:

CO1: Apply standard, form and validation controls.
CO2: Create master page and database connection.
CO3: comprehend different graphical layouts of website.
CO4: Work on other core issues of website like cookies, caching and dependencies.

Master of Science (Computer Science) Semester – III

(Session 2023-24)

COURSE CODE: MCSL-3114

DESIGN AND ANALYSIS OF ALGORITHMS

Course Outcomes:

After passing this course the student will be able to:

CO1: Analyse performance and complexity of various algorithms.

CO2: Comprehend greedy approach along with its application in various problems.

CO3: Comprehend dynamic programming approach along with its application in various problems.

CO4: Implement backtracking, search and traversal techniques.

Master of Science (Computer Science) Semester – III

(Session 2023-24)
COURSE CODE: MCSL-3115
SOFTWARE TESTING

Course Outcome:

After passing this course the student will be able to:
CO1: Comprehend fundamental concepts in software testing.
CO2: Analyse various software testing techniques.
CO3: Comprehend object-oriented software testing methods.
CO4: Perform test planning and debugging.

Master of Science (Computer Science) Semester – IV

(Session 2023-24)

COURSE CODE: MCSL-4111
ADVANCED SOFTWARE ENGINEERING

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend Quality Assurance and Control through application of various quality models.
CO2: Comprehend software risk and configuration management.
CO3: Implement structural modelling of the software.
CO4: Implement behavioural modelling of the software.

Master of Science (Computer Science) Semester – IV

(Session 2023-24)

COURSE CODE: MCSL-4112
MICROPROCESSOR AND ITS APPLICATIONS

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend block structure of microprocessor along with its components.
CO2: Comprehend architecture of 8086 and 8088 microprocessors.
CO3: Articulate memory interface of 8086 and 8088 microprocessors.
CO4: Comprehend I/O interfacing along with interrupt service.

Master of Science (Computer Science) Semester – IV

(Session 2023-24)

COURSE CODE: MCSL-4113
FOUNDATION OF STASTISTICAL COMPUTING

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend basics of Statistical Computing and managing data structures like vector, matrix, etc.
CO2: Create, operate and manage lists and data frames.
CO3: Apply control and I/O statements for generating outputs.
CO4: Simulate various descriptive and analytical algorithms using R language along with their visualization.

Master of Science (Computer Science) Semester – IV

(Session 2023-24)

COURSE CODE: MCSD-4115
DISSERTATION

Course Outcomes:

After passing course the student will be able to:

CO1: Apply the tools and techniques learnt to frame problems and their corresponding solutions.

CO2: Develop skills necessary to structure, manage and execute projects.

CO3: Demonstrate the skills to work as a member and as a leader of cohesive unit.

CO4: Develop presentation skills.

CO5: Perform documentation related to development of the project.