Industry Partner

SINCE : 2011

NEXCORE ALLIANCE

Bachelors(B.Voc) - Artificial Intelligence & Machine Learning
2025-26

Session:

Department of Computer Science & Engineering

Sem: 3

Semester: III						
Course Code	Course Title	Type of Course	L	T	P	Credits
BMA301	Discrete Mathematics	Core	4	0	0	4
BMA302	Operating System	Core	4	0	0	4
BMA303	Design & Analysis of Algorithms	Core	4	0	0	4
BMA304	Computer Organization & Architecture	Core	4	0	0	4
BMA305	Operating System Lab	Skill based	0	0	4	2
BMA306	Design & Analysis of Algorithms Lab	Skill based	0	0	4	2
Open Elective –I						
xxx		Open Elective Course	2	0	0	2
Discipline Elective-I(Any one of the following)						
			3	0	0	3
BMA307	Multimedia and Applications	Discipline Elective- I				
BMA308	Cloud Computing **Total**		**21**	**0**	**10**	**25**
Open Elective – I(Open Elective Courses for other Departments)						
BMA309	Introduction to Artificial Intelligence & Machine Learning	Open Elective Course	2	0	0	2

C ourse Title: DISCRETE MATHEMATICS

C ourse Code: BMA301

L	T	P	C redits
4	0	0	4

S emester: III

T otal Hours-60

L earning Outcomes:

After completion of this course, the learner will be able to:
1. Use mathematically correct terminology and notations
2. Construct correct direct and indirect proofs.
3. Use division into cases in a proof.

C ourse Content

1 5 Hours

4. Analysis the counter examples.

U NIT I
S ets, R elation a nd F unction:
Operations and Laws of Sets, Cartesian Products, Binary Relation, Partial Ordering Relation, Equivalence Relation, Image of a Set, Sum and Product of Functions, Bijective functions, Inverse and Composite Function, Size of a Set, Finite and infinite Sets, Countable and uncountable Sets, Cantor's diagonal argument and The Power Set theorem,

P rinciples o f M athematical I nduction: The Well-Ordering Principle, Recursive definition, The Division algorithm: Prime Numbers, The Greatest Common Divisor: Euclidean Algorithm, The Fundamental Theorem of Arithmetic.

U NIT II   **1 5 Hours**
Schroeder-Bernstein theorem.

 Basic counting techniques-inclusion and exclusion, pigeon-hole principle, permutation and combination. Propositional Logic: Syntax, Semantics, Validity and Satisfiability, Basic Connectives and Truth Tables, Logical Equivalence: The Laws of Logic, Logical Implication, Rules of Inference, The use of Quantifiers. Proof Techniques: Some Terminology, Proof Methods and Strategies, Forward Proof, Proof by Contradiction, Proof by Contraposition, Proof of Necessity and Sufficiency.

U NIT III   **1 5 Hours**

A lgebraic S tructures a nd M orphism:
Algebraic Structures with one Binary Operation, Semi-Groups, Monoids, Groups, Congruence Relation and Quotient Structures, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups, Algebraic Structures with

two Binary Operation, Rings, Integral Domain and Fields. Boolean algebra and Boolean Ring, Identities of Boolean Algebra, Duality, Representation of Boolean Function, Disjunctive and Conjunctive Normal Form.

U NIT IV   **1 5 Hours**

G raphs a nd T rees:

Graphs and their properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Aurelian and Hamiltonian Walks, Graph Coloring, Coloring maps and Planar Graphs, Coloring Vertices, Coloring Edges, List Coloring, Perfect Graph, definition properties and Example, rooted trees, trees and sorting, weighted trees and prefix codes, Bi- connected component and Articulation Points, Shortest distances.

T ransaction Modes

Self-Learning, Collaborative Learning and Cooperative Learning **S uggested Readings**
Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching,

- *J.P. Tremblay and R. Manohar. (1997). Discrete Mathematical Structure and Its Application to C omputer Science". TMG Edition,Tatamcgraw-Hill.*
  N orman L. Biggs. (2010). Discrete Mathematics. 2nd Edition, Oxford University Press. Schaum's O utlines Series, Seymour Lipschutz, MarcLipson.
- *M ott, Abraham Kandel. (2011). Discrete Mathematic. TataMcGraw-Hill.*

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C ourse Title: OPERATING SYSTEM

C ourse Code: BMA302

L	T	P	C redits
			4
4	0	0	

T otal Hours-60 Learning

O utcomes:

After completion of this course, the learner will be able to:
1. Design the algorithms to write programs.
2. Understand the concept of arrays, pointers and structures to formulate algorithms and programs
3. Apply programming to solve simple numerical method problems, namely rot finding

C ourse Content

1 5 Hours

4. Describe the Function, differentiation of function and simple integration

U NIT I   Concept of Operating Systems, Generations of Operating systems, Types of
I ntroduction: Operating Systems, OS Services, System Calls, Structure of an OS - Layered, Monolithic, Microkernel
System : Operating Systems, Concept of Virtual Machine. Case study on UNIX and WINDOWS Operating

P rocesses:

T hread: Definition, Process Relationship, Different states of a Process, Process State transitions,
Process Control Block (PCB), Context switching

1 5 Hours

U NIT II Definition, Various states, Benefits of threads, Types of threads, Concept of multithreads,
P rocess S cheduling:

 Foundation and Scheduling objectives, Types of Schedulers, Scheduling
criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling
algorithms: Pre-emptive and Non-pre-emptive, FCFS, SJF, RR; Multiprocessor scheduling: Real

I nter-process C ommunication:

 Critical Section, Race Conditions, Mutual Exclusion, Hardware
Solution, Strict Alternation, Peterson's Solution, The Producer\ Consumer Problem, Semaphores,
Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem,

D eadlocks:

U NIT III   Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention,
Dining Philosopher Problematic's algorithm, Deadlock Recovery

1 5 Hours

M emory M anagement:

                          Basic concept, Logical and Physical address map, Memory allocation:
   Contiguous Memory allocation– Fixed and variable partition–Internal and External fragmentation
and Compaction; Paging: Principle of operation – Page allocation –Hardware support   for
paging, Protection and sharing, Disadvantages of paging. Failures and recovery management.

Virtual Memory:

Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault, Working Set, Dirty page/Dirty bit – Demand paging, Page Replacement algorithms: Optimal, First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recently used (LRU).

UNIT IV   **15 Hours**

I/O Hardware:

I/O devices, Device controllers, Direct memory access Principles of I/O Software:

Goals of Interrupt handlers, Device drivers, Device independent I/O software, Secondary-Storage

File Management:
Concept of File, Access methods, File types, File operation, Directory structure,

File System structure, Allocation methods (contiguous, linked, indexed), Free-space management
Structure: Disk structure, Disk scheduling algorithms
(bit vector, linked list, grouping), directory implementation (linear list, hash table), efficiency and

performance.

Transaction Modes
Self-Learning, Collaborative Learning and Cooperative Learning **Suggested Readings**
Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching,

- *Charles Crowley. (1996). Operating System; A Design-oriented Approach. 1st Edition, Irwin Publishing.*
- *Gary J.Nutt, Addison. (2002). Operating Systems: A Modern Perspective. 2nd Edition Wesley.*
- *Maurice Bach, Prentice-Hall of India (1986). Design of the Unix Operation Systems. 8th Edition.*
- *Daniel P. Bovet, Marco Cesati, O'Reilly and Associates. (2005). Understanding the Linux Kernel. 3rd Edition*
- *Waddington, D. G., and D. Hutchison. (1999): "Resource partitioning in general purpose operating systems." ACM SIGOPS Operating Systems Review 33, no. 4*
- *Abraham Silberschatz,(2021) Peter Baer Galvin, Greg Gagne, "Operating System Principles", 10th edition.*

     Web Links
- *https://www.techtarget.com/whatis/definition/operating-system*
- *https://www.coursera.org/courses?query=operating system*
- *https://www.cse.iitb.ac.in/~mythili-operating-system*
- *https://computer.howstuffworks.com/web-operating-system.htm*

C ourse Title: DESIGN & ANALYSIS OF ALGORITHMS

C ourse Code: BMA303

L	T	P	C redits
4	0	0	4

T otal Hours: 60

L earning Outcomes:

After completion of this course, the learner will be able to:
1. Describe the greedy paradigm and develop the greedy algorithms.
2. Implement and examine the divide-and-conquer paradigm.
3. Develop the dynamic programming algorithms and evaluate their computational complexity.
4. Analysis the graphs to find shortest path.

C ourse Content

U NIT I   **1 5 Hours**

I ntroduction:

Algorithm and its importance, Mathematical foundations- Growth functions, Complexity analysis of algorithms.

D ivide a nd C onquer:

Basic technique and its application on Binary Search, Finding Maximum and Minimum and on sorting techniques such as Merge Sort, Quick Sort.

U NIT II   **1 5 Hours**

G reedy A lgorithms:

General method, using greedy algorithm to solve Knapsack problem,

Minimum-Cost spanning trees problem, Single source shortest path problem and Travelling

salesperson problem.

D ynamic P rogramming: Introduction to dynamic programming and application of the algorithm   **1 4 Hours**

to solve multistage graphs, all pair's shortest path problem and Knapsack problem.

Backtracking:

General backtracking algorithm, Application of backtracking to 8 Queens' problem, Sum of subsets, Graph coloring, Hamiltonian cycles and Knapsack problem.

S tring M atching A lgorithms: **1 6 Hours**

Introduction, Brute Force algorithm, Rabin-Karp algorithm, KMP algorithm, and Boyer-Moore algorithm.

U NIT IV

N P-completeness a nd A pproximation A lgorithms:

Introduction to P, NP, NP-hard and Complete problems, Examples of NP-complete problems, Introduction to approximation algorithms,

Absolute approximations, E-approximations . **A pproximation a lgorithms u sing l inear p rogramming, randomization, and specialized techniques** .

T ransaction Modes

Self-Learning, Collaborative Learning and Cooperative Learning **S uggested Readings**
Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching,

- *E llis H orowitz, S artaj S ahni a nd S anguthevar R ajasekaran, "Fundamentals o f C omputer*

  A lgorithms" Galgotia Publications (Year 2002).

  T homas H . C ormen, C harles E . L eiserson, R onald R ivest, a nd C lifford S tein, "Introduction t o
  A lgorithms", MIT Press Year 1990.

- *S anjoy D asgupta, C hristos P apadimitriou, a nd U mesh V azirani, "Algorithms", M cGraw-*

  Hill

- *E ducation 2006.*

  M ichael T . G oodrich a nd R oberto T amassia, "Algorithm D esign: F oundations, A nalysis, a

  nd I nternet

- *E xamples", Wiley (Year 2002).*
- *A lfred V . A ho, J ohn E . H opcroft, a nd J effrey. D . U llman, "The D esign a nd A nalysis*

  o f C omputer

- *A lgorithms", P earson E ducation 1 974. 6 . J ohn K leinberg a nd E va T ardos, "Algorithm*
  D esign",

  P earson Education 2005.

  T . H. CORMEN, C. E. LEISERSON, R. L. RIVEST, AND C. STEIN. Introduction to

W eb Links *A lgorithms,   MIT   Press,   New   York,   3rd   edition,   2009.*

  - *h ttps://www.classcentral.com/course/swayam-Design-and-analysis-of- a lgorithms-*

S . DASGUPTA, C. PAPADIMITRIOU, AND U. VAZIRANI. Algorithms, McGraw-Hill, New *Design-and-analysis-of-*
  - *h ttps://vssut.ac.in/lecture_notes/lecture1428551222.pdf* *D esign-and-analysis-of-*
Y ork, 2008. *a lgorithms-*

  - *h ttps://sites.northwestern.edu/hartline/eecs-336-Design-analysis-of-algorithms .*

C ourse Title: Computer Organization & Architecture

C ourse Code: BMA304

L	T	P	C redits
4	0	0	4

T otal Hours-60 Learning

O utcomes:

After completion of this course, the learner will be able to:
1. Understand the basic concept of computer fundamentals, Number system, Boolean algebra, Karnaugh map and Perform problems
2. Explain the concept of stored program, role of operating system, Instruction sets and Addressing modes and Demonstrate problems on Addressing modes.
3. Use of control unit and various I/O operations

C ourse Content   **1 5 Hours**

4. Classify the concept of Instruction pipeline, RISC, CISC
CPU, memory, input-output subsystems, control unit.
U NIT I
Instruction set architecture of a CPU – registers, instruction execution cycle, RTL0interpretation of
F unctional b locks o f a c omputer: instructions, addressing modes, instruction set. Case study – instruction sets of some common

D ata r epresentation:

signed number representation, fixed and floating-point representations,
cpus.   character representation. Computer arithmetic – integer addition and subtraction, ripple carry
U NIT II adder, carry look-ahead adder, etc. Multiplication – shift-and add, Booth multiplier, carry save
multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic.   **1 5 Hour**

I ntroduction to x86 architecture:

design approaches. Case study – design CPU control unit design: hardwired and micro program.
semiconductor memory technologies, memory organization. **P eripheral devices and their**

Input-output subsystems, I/O device interface, I/O transfers-program controlled,
interrupt driven and DMA, privileged and non-privileged   instructions,   software
interrupts   and   exceptions. Programs   and processes–role of interrupts in
U NIT III   **1 4 Hours**
P ipelining: Basic concepts of pipelining, through put and speedup, pipeline hazards. **P arallel**
P rocessors:
process state transitions, I/O device interfaces – SCII, US

U NIT IV   Introduction to parallel-processors, Concurrent   **1 6 Hours** access to
Memory and cache coherency.
M emory   o rganization:

Memory   interleaving,   concept   of hierarchical   memory

organization, cache memory, cache size vs. Block size, mapping functions, replacement algorithms, write policies.

T ransaction M odes

S uggested Readings   Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group
Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

- *J ohn P. Hayes. (1988). Computer Architecture and Organization. 3r d E dition, WCB/McGraw- Hill.*
- *W illiam S tallings. (2016). C omputer O rganization a nd A rchitecture. D esigning f or P erformance.*
  1 0th Edition, Pearson Education.
- *V incent P . H euring a nd H arry F . J ordan. (2004). C omputer S ystem D esign a nd A rchitecture, 2 nd*
  E dition by Pearson Education.

Course Title: OPERATING SYSTEM LAB	L	T	P	Credits
	0			2

Course Code: BMA305

0   4

Total Hours-30 Learning

Outcomes:

After completion of this course, the learner will be able to:
1. Acquire the knowledge of Linux operating system.
2. Develop and debug the various Linux commands.
3. Perform various shell commands.

Course Content

Installation Process of various operating systems

1. **Commands for files & directories:** cd, ls, cp, md, rm, mkdir, rmdir. Creating and viewing files
4. Discuss shell programming & its concepts. related commands: checking disk free spaces. Processes in
Linux, connecting processes with pipes, background processing, managing multiple processes.
Manual help. Background process: changing process priority, scheduling of processes at
command, batch commands, kill, ps, who, sleep. Printing commands, grep, fgrep, find, sort, Cal,

2. **Administrative commands:** ACCEPT DATE, LIBVOLUME, EXPORT commands , IMPORT
banner, touch, file. File related commands ws, sat, cut, grep.

commands , LOCK commands , MOVE commands , QUERY commands , REGISTER commands ,
ACTIVATE POLICYSET (Activate a new policy set) , ASSIGN DEFMGMTCLASS) AUDIT commands ,
LDAPDIRECTORY, BACKUP commands ,
BEGIN EVENTLOGGING (Begin logging events) , CANCEL commands , CHECKIN LIBVOLUME
(Check a storage volume into a library) , CHECKOUT LIBVOLUME (Check a storage volume out
of a library) , CLEAN DRIVE (Clean a drive) , COMMIT (Control committing of commands in a
macro) , COPY commands , DEFINE commands , DELETE commands , DISABLE commands ,
DISMOUNT command , DISPLAY OBJNAME (Display a full object name) , ENABLE commands ,
EXPORT commands , IMPORT commands , LOCK commands , MOVE commands , QUERY
commands ,   REGISTER   commands ,
PERFORM LIBACTION, PING SERVER, QUERY ,QUIT, RECLAIM STGPOOL, RECONCILE VOLUMES,
REGISTER, REMOVE commands , RENAME commands , REPLICATE NODE, REPLY, RESET
PASSEXP, PASSEXP, RESET , RESTART EXPORT, RESTORE commands , MACRO , MIGRATE
STGPOOL , REVOKE
commands ,   ROLLBACK,   RUN,   SET   commands ,
SELECT, SETOPT, SHRED DATA (Shred data) , SETOPT, SUSPEND EXPORT
UNLOCK commands , UPDATE commands , VALIDATE commands , VARY, AUDIT commands ,
BACKUP commands , CANCEL commands , COPY commands .

S hell P rogramming:

3. Basic of shell programming, various types of shell, Shell Programming in bash, conditional & looping statement, case Statement, parameter passing and arguments, shell variables, shell keywords, creating shell programs for automate system tasks, report printing.

C ourse Title: DESIGN & ANALYSIS OF ALGORITHMS LAB

C ourse Code: BMA306

L	T	P	C redits
0	0	4	2

T otal Hours-30

L earning Outcomes: After completion of this course, the learner will be able to:

1. Examine randomized algorithms.
2. Analyze the performance of algorithms.
3. Describe and implement the dynamic-programming paradigm.
4. Examine and recognize the greedy paradigm.

C ourse Content

1. Write a program to implement bubble sort algorithm by comparing its complexity.
2. Write a program to implement linear search algorithm by comparing it complexity.
3. Write a program to implement binary search algorithm by comparing its complexity.
4. Write a program to implement PUSH operation in stacks.
5. Write a program to implement POP operation in stacks.
6. Write a program to implement Queues.
7. Write a program to insert an element in the beginning of the link list.
8. Write a program to delete an element from the middle of the link list.
9. Write a program to implement the concept of queen's problem.

L	T	P	C redits
3	0	0	3

C ourse Title: Multimedia and Applications Course

C ode: BMA307

T otal Hours:45

C ourse Learning Outcome Outcomes: On successful completion of this course, the students

will be able to:

3. Describe technical characteristics and performance of multimedia system and terminals.
   Design creative approach in application of multimedia devices, equipment and systems
2. Interpret and analyze measurement results obtained on the multimedia system and components,

5. Describe the development process and applications of the multimedia systems
4. Carry out experiments and measurements on the multimedia systems in laboratory conditions on real components

C ourse Content

U nit-I **1 0Hours**

I ntroduction T o M ultimedia T echnology -

computers, communication and entertainment framework for multimedia system, features of multimedia system, Multimedia Hardware devices& software development tools, M/M devices, presentation devices and the user interface, M/M presentation and authoring. **1 5Hours**

D igital R epresentation O f S ound A nd I mage -Digital representation of sound and transmission, Basics of Video, ,Types of Video Signals, Analog Video, Digital Video, brief survey of speech recognition and generation, digital video and image compression, JPEG image compression standard, MPEG motion video compression, DVI technology, timbered media representation and delivery. **1 0Hours**

M /M S oftware : -M/M software environments, limitations of workstation operating systems, M/M system services, OS support for continuous media applications, media stream protocol, M/M file system and information representation system, and data models for M/M and hypermedia

information.   : -Application of M/M, intelligent M/M system.

U nit-IV   **1 0Hours**

V irtual R eality System Virtual reality OS, distributed virtual environment system,
virtual environmental displays and orientation tracking, visually coupled systems requirements,

M ultimedia C ommunication:

intelligent VR software systems.
                                        Building Communication network, Application Subsystem,
UsesTransport Subsystem, QOS, Resource Management, Distributed Multimedia Systems.

        Applications of environments in various fields such as medical entertainment,
manufacturing, business, education etc.

S uggested Readings
1. **S tephen McGloughlim** , "Multimedia on the Web", PHI.
2. **V illamil-Casanova &Nolina** , "Multimedia production, planning & Delivery", PHI.
3. **L ozano,** "Multimedia sound & video", PHI.
4. **J . Jeefcoate,** "Multimedia in Practice Tech & application".

L	T	P	Cr
			3

3   0   0

Course Title: Cloud Computing Course

Code: BMA308

Total Hours: 45

Course Learning Outcome: On successful completion of this course, the students will be able to:

1. Design Vision, Reference Model, Benefits, Limitations, Open Challenges, Grid and Utility Computing.
2. Demonstrate Service Models, Deployment Models, Cloud Entities, Cloud Clients, and Cloud Programming Models.
3. Describe Cloud Security: Infrastructure Security, Data Security, Identity and Access Management, Privacy Management, Security as a Service on Cloud
4. Resource Provisioning, Bill Management, Multitenancy and Isolation, Service Level Agreement (SLA) and Quality of Service (QoS)
5. Infrastructure Security, Data Security, Identity and Access Management, Privacy Management, Security as a Service on Cloud.

Course Content

UNIT-I   **10 Hours**

Cloud Computing:

Overview, Applications, Intranet and the Cloud, First Movers on the cloud, the need for Cloud Computing, Benefits of cloud Computing, Limitations of the Cloud Computing, security concerns and regulatory issues, over view of different cloud computing applications which are implemented, Business case for implementing a Cloud.

UNIT-II   **10 Hours**

Cloud computing and Service Models:

Public, Private, and Hybrid Clouds, Cloud Ecosystem and Enabling Technologies, Infrastructure-as- a- Service (IaaS), Platform- and Software-as-a-Service (Paas, SaaS). Architectural Design of Compute and Storage Clouds: A Generic Cloud architecture Design, Layered Cloud Architectural development, Architectural Design Challenges. Cloud Standards: Applications, Client, Infrastructure, Services.

10 Hours

UNIT-III

C loud C omputing M echanisms:

Software as a service: Overview, Driving Forces, Company offerings, Industries, Software services, Overview Mobile Device Integration, Providers, Microsoft Online Application development, Google, Microsoft, Intuit Quick base, Cast Iron Cloud, Bungee Connect, Development Platforms: Google, Sales Force, Azure, Trouble shooting, Application management

U NIT-IV   **1 0 Hours**

L ocal Clouds : Virtualization, server solutions, Thin Clients

M igrating t o t he c louds : Cloud services for individuals, Mid-market, and Enterprise wide,

Migration, best practices, analyzing the service.

S uggested Readings

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

2.   Cloud Computing Bible, Barrie Sosinsky, Wiley India Pvt. Ltd, ISBN-13: 978- 81-265-2980-3, New Delhi, India, 2011.

3.   Cloud Computing: Principles and paradigms, Raj Kumar Buyya, James Broberg, AndrezeiM.Goscinski, Wiley India Pvt. Ltd, ISBN-13: 978-81-265- 4125-6, New Delhi, India, 2011.

R EFERENCE BOOKS:

 1.   Cloud Computing for Dummies, Fern Halper, Hurwitz, Robin Bloor, Marcia Kaufman, Wiley India Pvt. Ltd, ISBN-13: 978-0-47-0597422, New Delhi, India, 2011.

2.   Dr. Saurabh Kumar, Cloud Computing: Insights into New-Era Infrastructure, Wiley India Pvt. Ltd, and ISBN-13: 978-8-12-6528837, New Delhi, India, 2011.

	L	T	P	C redits
Course Title: INTRODUCTION TO ARTIFICIAL INTELLIGENCE & MACHINE LEARNING				
Course Code: BMA309	2	0	0	2

Total Hours-30

Learning Outcomes:

After completion of this course, the learner will be able to:

5. Design expert system by using AI tools.
6. Compare and develop expert system with the help of Neural Networks
7. Understand the concept of expert system using Machine Learning.
8. Create an expert system using Fuzzy Logic.

Course Content

10 Hours

UNIT I
Introduction: What is AI, Importance of AI, Early work in AI, Applications of AI, Knowledge and its definition. Knowledge Representation: Prepositional logic, FOPL, Properties of Well-formed formulas, Conversion to Clausal form, Inference rules, Resolution principle.

UNIT II
8 Hours
Structured Knowledge: Introduction, Associate frame structures, Conceptual dependencies and scripts.
Knowledge Organization and Manipulation: Classification patterns, Recognizing and understanding speech. Concepts, Uninformed or Blind search, informed search, Searching- And-OR graphs, Pattern Recognition, Recognition Classification process,

UNIT III
6 Hours
Generative AI: How does generative AI work? Generative AI models, what are Dall-E, ChatGPT and Bard, use cases, benefits and its limitations, Ethics and bias, Generative AI vs. AI, Generative AI history.
Planning: planning as search, partial order planning, construction and use of planning graphs. Decision-Making: basics of utility theory, decision theory, sequential decision problems, elementary game theory and sample applications.

UNIT IV
6 Hours
Expert System: Definition, Rule based architecture, dealing with uncertainty, Knowledge acquisition and validation, knowledge system building tools.
Knowledge Acquisition: Types of learning, General Learning model, Performance measures.
Transaction Modes Learning nearest neighbor, naive Bayes, and decision tree classifiers.

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

S uggested Readings

- *D an W. Patterson. (1990). Introduction to Artificial Intelligence and Expert Systems.PHI P ublication.*
- *P eter Jackson. (1998). Introduction to Expert System. AddisonWesley.*