L.J. Institute of Engineering & Technology, Ahmedabad

Computer Engineering Department

MSE-1 Syllabus, Semester VII

Sr. No.	Subject Name & Code	Unit/Chapter Name-Topics (As per GTU Syllabus) Total Marks-30
1	Machine Learning (3170724)	**Unit-1 Introduction to Machine Learning:** Overview of Human Learning and Machine Learning, Types of Machine Learning, Applications of Machine Learning , Tools and Technology for Machine Learning . **Unit-2 Preparing to Model:** Machine Learning activities, Types of data in Machine Learning, Structures of data, Data quality and remediation, Data Pre-Processing: Dimensionality reduction, Feature subset selection. **Unit-3 Modelling and Evaluation:** Selecting a Model: Predictive/Descriptive, Training a Model for supervised learning, model representation and interpretability, Evaluating performance of a model, Improving performance of a model. **Unit-4 Basics of Feature Engineering:** Feature and Feature Engineering, Feature transformation: Construction and extraction, Feature subset selection : Issues in high-dimensional data, key drivers, measure and overall process.
2	Mobile Computing and Wireless communication (3170710)	**Unit-1 Introduction, Transmission Fundamentals:** Signals for Conveying Information, Analog and Digital Data Transmission, Channel Capacity, Transmission Media, Multiplexing **Communication Networks:** LANs, MANs and WANs, Switching Techniques, Circuit Switching, Packet Switching **Unit-2 Cellular Wireless Networks:** Principles of Cellular Networks, First-Generation Analog Second-Generation TDMA Second-Generation CDMA, Third-Generation Systems **Antennas and Propagation**: Antennas, Propagation Modes, Line-of-Sight Transmission, Fading in the Mobile Environment **Spread Spectrum**-The Concept of Spread Spectrum, Frequency Hopping Spread Spectrum, Direct Sequence Spread Spectrum **Coding and Error Control:** Error Detection, Block Error Correction Codes, Convolutional Codes, Automatic Repeat Request **Unit-3** **Multiple access in Wireless System**: Multiple access scheme, frequency division multiple access, Time division multiple access, code division multiple access, space division multiple access, packet radio access, multiple access with collision avoidance.
3	Compiler Design (3170701)	**Unit-1 Overview of the Compiler and its Structure:** Language processor, Applications of language processors, Definition-Structure-Workingof compiler, the science of building compilers, Basic understanding of interpreter andassembler. Difference between interpreter and compiler. Compilation of source code intotarget language, Cousins of compiler, Types of compiler **Unit-2 Lexical Analysis:** The Role of the Lexical Analyzer, Specification of Tokens, Recognition of Tokens, Input Buffering, elementary scanner design and its implementation (Lex), Applying concepts ofFinite Automata for recognition of tokens. **Unit-3 Syntax Analysis:** Understanding Parser and CFG(Context Free Grammars), Left Recursion and Left Factoring of grammar Top Down Parsing Algorithms
4	Artificial Intelligence(3170716)	**Unit-1 Introduction:** The AI Problems, The Underlying Assumption, AI techniques, The Level of The Model, Criteria For Success **Unit-2 Problem, State Space Search & Heuristic Search Techniques:** Defining The Problems As A State Space Search, Production Systems, Production Characteristics, Production System Characteristics and Issues in the Design of Search Programs, Generate-And-Test, Hill Climbing, Best-First Search, Problem Reduction, Constraint Satisfaction, Means-Ends Analysis. **Unit-3 Knowledge Representation:** Representations And Mappings, Approaches To Knowledge Representation, Representation Simple Facts In Logic, Representing Instance And Isa Relationships, Computable Functions and Predicates, Resolution, Procedural versus Declarative Knowledge, Logic Programming, Forward versus Backward Reasoning.
5	Information Security (3170720)	**Unit-1** Symmetric Cipher Model, Cryptography, Cryptanalysis and Attacks; Substitution and Transposition techniques **Unit-2** Stream ciphers and block ciphers, Block Cipher structure, Data Encryption standard (DES) with example, strength of DES, Design principles of block cipher, AES with structure, its transformation functions, key expansion. **Unit-3** Electronic Code Book, Cipher Block Chaining Mode, Cipher Feedback mode, Output Feedback mode, Counter mode **Unit-4** Public Key Cryptosystems with Applications, Requirements and Cryptanalysis, RSA algorithm, its computational aspects and security
6	Mobile Application Development (3170726)	**Unit-1** Pre Requirements (Basic Knowledge of OOPS concept and Core java) **Unit-2** Fundamental : Software Engineering with SDLC, Flow chart, DFD, SQL database **Unit-3** Introduction to Android, Android System with Architecture, Android Architecture, Development with Android – Platforms, Tools, Versions, Setup Android Environment, Say Hello to Android Application, Building Blocks of Android Application, Work with Activity, Activity Lifecycle, Intents Fragments, Fragment Lifecycle **Unit-4** Android UI And Component using Fragments Create Android UI, Working with Layout, Create Custom Layouts, Work with UI Components and Events, Material Design Toolbar, Tab Layout, Recycler View and Card View, Android Menus