SARDAR PATEL UNIVERSITY
VALLABH VIDYANAGAR
M.Sc. (Mobile Technology)
(Under Choice Based Credit Scheme)

COURCE OF STUDY
RULES FOR DEGREE OF THE MASTER OF SCIENCE
(M. Sc.) MOBILE TECHNOLOGY

R.P.G. MT. 1	A Candidates for admission to the Two year Master of Science (Mobile Technology) course must have passed a Bachelor's degree examination (10+2+3) pattern) either in science with Computer Science or Information Science or Computer Application (B.C.A)/ B.E(CE)/ B.E(IT) /B.E(EC) / B.Sc.(CS)/ B.Sc.(IT) / B.Sc.(CA & IT) /PGDCA / PGDCAA/B.Sc.(Maths) / BBA(ITM)/BBA(ISM) / BVOC(SD) /B.Sc.(Statistics) with at least 40% marks of this University or any other examination recognized as equivalent thereto by this university.
R.P.G. MT. 2	The examination for the various theory courses and laboratory work will be conducted under semester system. For this purpose each academic year will be divided into two semesters.
R.P.G. MT. 3	The ratio between the external and internal assessments will be 70:30.
R.P.G. MT. 4	Candidate shall be required to attend at least 75% of the total theory, lectures, practical's and project work organized under each of the courses by them during the semester.
R.P.G. MT. 5	(I) The Head of the department in consultation with other teachers of the department will prepare in the beginning of the semester a detailed scheme of the periodic test(s), seminars, quizzes etc., and the programme for the test examinations and the same will be announced to the candidates. (II) The record of the test examinations as well as seminars, and quizzes will be maintained by the department (III) Every candidate shall maintain a regular record of his practical and project work shall be duly certified by his teacher(s) from time to time.
R.P.G. MT. 6	Candidate will be required to obtain at least 33% marks in the internal evaluation separately in each head of passing. A candidate who fails to obtain 33% marks in not more than two heads of passing may be allowed to appear at the university examination by the Head of the department concerned on the recommendation of the committee appointed by him to assess the candidate's overall performance. (Note: Head of passing will mean a course in theory or practical or project work)
R.P.G. MT. 7	The final results for the award of the degree will be declared on the basis of the grand total of all the semesters examinations prescribed for the degree examination.
R.P.G. MT. 8	No candidate will be allowed to reappear in course in which he/she has already passed.
R.P.G. MT. 9	Standard of Passing: The standard of passing the M.Sc. (Mobile Technology) degree examination will be as under:- (1) To pass any semester examination for the M.Sc. degree a candidate must obtain at least 40% marks in the university Examination and 40% marks in the aggregate of University and Internal Examination in each course of Theory, Practical and Project work. (2) Those of the successful candidates who obtain 50% or more marks in the aggregate of all the semesters taken together will be placed in the Second Class and those who obtain 60% or more marks in the aggregate will be placed in the

	First Class. The successful candidates who obtain 70% or more marks in the aggregate of all the semesters taken together will be declared to have passed the examination in the First Class with distinction.
R.P.G. MT. 10	(i) A candidate who fails in more than two courses (any two out of total heads of passing in the particular semester) in particular semester will not be admitted for further study at a subsequent semester and will be required to repeat the courses in which he/she has failed by joining the department as a regular student in the semester in which these courses are again offered. A Candidate failing in not more than two courses at any semester examination will be promoted to the subsequent semester according to the following scheme: (II) A Candidate failing in the First Semester will be permitted to prosecute his/her study up to the Third Semester but will not be permitted to go to the Fourth Semester until he/she has cleared all the courses of the First Semester even though he/she may have passed in the Second Semester and/or Third Semester. A Candidate failing in the Second Semester will be permitted to prosecute his studies up to the Fourth Semester.
R.P.G. MT. 11	The Following are the courses for the Master of Science (Mobile Technology) degree examinations

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Semester – I

M. Sc. (Mobile Technology) – 1st Semester Syllabus

Effective From: 2017-2018

PS01CMBT21	Mobile Device Architecture
PS01CMBT22	Advanced Programming Concepts & Data Structures
PS01CMBT23	Relational Database Management System
PS01CMBT24	Mobile Application Development
PS01CMBT25	Discrete Mathematics
PS01CMBT26	Practical based on PS01CMBT22 and PS01CMBT23

Paper No: PS01CMBT21
Paper Title: MOBILE DEVICE ARCHITECTURE

Unit 1: Analysis for Mobile Handsets
Introduction Mobile Handsets, Impact of signal propagation on radio channel, Signal attenuation & path loss, Doppler spread, Fading, Interference, Noise classification, Diversity, Types of Equalizers, Techniques for Interference Mitigation, Channel coding – Block codes,

Unit 3: Design Solutions
Introduction to RF receiver, Mixer Implementations, Receiver front end Architecture, Receiver Performance, Transmitter front end Architecture, Transmitter Architecture Design, Design challenges

Unit 3: Anatomy of GSM Mobile Handset
Introduction to GSM handsets, Functional blocks, Hardware block diagram, Transmitter & Receiver Module, Loudspeaker, Microphone, SIM, Application processing Unit, Camera, LCD display, Keypads, Bluetooth, USB, Battery, Clocking Scheme, Memory, Receiver performance

Unit 4: Mobile Operations
Initial Procedures, Idle Mode, Location Updating, Security Procedure, Access Mode, Handover, Radio Resource Control, Mobility Management, Call Routing, Power Control, Discontinuuos transmission & Reception, Frequency hopping

Text Book:
1. Mobile Handset Design by Sajal K. Das, John Wiley and Sons, 2010

Reference Book:
1. Mobile Application: Architecture, Design and Development, Robbie Schell, Heather Schneider, Valentino LW, Prentice & Hall
2. Mobile Design & Development, Brain Fling, O'Reilly Media, Inc.
3. Mobile Application Design and Architecture, Automated Logical Software Pvt. Ltd.

Paper No: PS01CMBT22
Paper Title: Advanced Programming Concepts & Data Structures

Unit 1: Advanced Programming

Pointers and Indirection, Command line arguments, Macros, File Management ,
Graphics

Unit 2: Object Oriented Concepts and OO Programming

Difference between conventional and object oriented languages
Abstraction and Encapsulation, Classes, objects and instantiation, data members, methods Inheritance, Polymorphism, function and operator overloading, Implementing polymorphism and overloading, Implementing inheritance, access control, virtual methods, Creating and destroying objects, runtime memory management

Unit 3: Data Structures and File Management

Arrays, Linked Lists, Stacks, Queues, Trees, Concepts of fields, records and files, Variable length records, Sequential file organization, Random file organization

Unit 4: Indexing Methodology

Indexing structures like B trees and B+ trees, ISAM, Hashing techniques for direct files
Inverted lists, multi-lists, Heaps

Text Books:

1. Tremblay J. & Sorenson P.G: An Introduction to Data Structures with Applications 2nd Edition – TMH
2. Stroustrup, Bjarne: The C++ Programming Language 3rd Editioin – Addison Wesley

Reference Books:

3. Singh Bhagat & Naps Thomas: Introduction to Data Structures – TMH
4. Liberty Jesses & Keogh Jim: C++ An Introduction to Programming – PHI
5. Langran Yedidyah, Augeustem Moshe J, Tenenbaum Aron M: Data Structures Using C and C++ - PHI

Paper No: PS01CMBT23
Paper Title: RELATIONAL DATABASE MANAGEMENT SYSTEM

Unit 1: Introduction to DBMS:
Introduction and applications of DBMS, Purpose of database, Data Independence, Database System, Architecture- levels, Mappings, Database, users and DBA
Relational Model:
Structure of relational databases, Domains, Relations, Relational algebra – fundamental operators and syntax, Relational algebra queries, tuple relational calculus

Unit 2: Entity- Relationship Model
Basic concepts, Design process, Constraints, Keys, Design issues, E-R diagrams, weak entity sets, extended E-R features – generalization, specialization, aggregation, reduction to E-R database schema
Relational Database design:
Functional Dependency – definition, trivial and non-trivial FD, closure of FD set, closure of attributes, irreducible set of FD, Normalization – 1Nf, 2NF, 3NF, Decomposition using FD-dependency preservation, BCNF, Multivalued dependency, 4NF, Join dependency and 5NF

Unit 3: SQL Concepts:
Basics of SQL, DDL, DML, DCL,
Structure – creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator,
Functions – aggregate functions, Built-in functions – numeric, date, string functions,
Set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All, view and its types. Transaction control commands – Commit, Rollback, Savepoint

Unit 4: Security and PL/SQL Concepts:
Security: Introduction, Discretionary access control, Mandatory, Access Control, Data Encryption
PL/SQL Concepts: Cursors, Stored Procedures, Stored Function, Database, Triggers

Text Books:
1. An introduction to Database Systems, C J Date, Addition-Wesley.

SQL- PL/SQL by Ivan bayross.

Reference Books:
1. Database System Concepts, Abraham Silberschatz, Henry F. Korth & S. Sudarshan, McGraw Hill.
2. Understanding SQL by Martin Gruber, BPB
3. Oracle – The complete reference – TMH /oracle press

Paper No: PS01CMBT24
Paper Title: MOBILE APPLICATION DEVELOPMENT

Unit 1: Mobile Application Principles
Mobile Application Development Paradigm, what is and application? Mobile Application, Programming rules and Challenges, Mobile Programming Tools, Mobile Application Evolution, Thin Client, Fat Client, Future of Mobile App Development, Mobile Client Server App Architecture, Introduction to Client-Server Architecture, Distributed Client-Server Architecture, Role of Client-Server, Adaptation Techniques, Extended Client-Server Architecture, Mobile Data Access, Platform Dependencies and Trends, Platform Dependency difficulty, How to address and solve dependency

Unit 2: Mobile Programming Languages
Mobile App Programming in Java, Introduction to Java, Java Compiler, Java Interpreter, Advantages of Java, Disadvantages of Java, Programming Methodology, Mobile App Programming in C++, Introduction to C++, Introduction to C#, Microsoft embedded VC++, Mobile Programming best practices, User Analysis, Organizational Analysis,

Unit 3: Mobile platform and NW environment
Mobile App Testing Environment, OTA App Provisioning. Mobile Applications: What is Web App?, Context of Mobile Applications, Pros and Cons of Mobile Web App, SIM based Mobile App Development, What is SIM?, SIM as a Platform, SIM as Service Differentiator, Introduction to UI, Principles for UI Development

Unit 4: Mobile Services
Evolution of Mobile Services, Types of Mobile Services, Personal Services, Commn Moduley Services, Introduction to Consumer Services, Various Consumer Services, SMS, MMS, Games, Proprietary vs. Standardize Interface, Various Developer Services, SMS Web Service, MMS Web Service, Overview and Features.

Text Book:
1. Professional Mobile Application Development by Jeff McWherter, Scott Gowell, 2012

Reference Books:
1. Mobile Computing Principles: Designing and Developing Mobile Applications by Reza B'Far, Cambridge University, 2005
2. Mobile Applications: Architecture, Design, and Development by Valentino Lee, Heather Schneider and Robbie Schell, Pearson Education, 2004

Paper No: PS01CMBT25
Paper Title: Discrete Mathematics

Unit 1: Introduction
Finite, Infinite and uncountable infinite sets Ordered sets, The rules of sum and product
Relations and functions Relational database model Reflexive, symmetric and transitive relations, compatibility and equivalence relations Partial ordering relations and lattices, Basic properties of lattices, Operations of join and meet in a lattice, Distributive lattices, Boolean algebras as lattices Canonical expressions, Applications to digital circuits and switching circuits.

Unit 2: Graphs.
Basics of Graph, Application of graphs, Problem solving using graph theory.
Connected graphs, Sub-graphs, Euler graphs, Complete graph.
Multigraphs and weighted graphs, Paths and circuits, Shortest path in a weighted graph
Eulerian and Hamiltonian paths and circuits Planar graphs

Unit 3: Analysis of algorithms
Introduction, Time complexity of algorithms, The shortest path algorithm, Complexity of problems, Tractable and intractable problems.

Unit-4: Time Series and Forecasting
Introduction, Utility of Times Series analysis, Components of Time series, Cyclic variation and Irregular variation, Method of measurements of components, Merits and demerits, Forecasting models and methods.

Text Books:
1. C Lliu: Elements of Descrete Mathematics – TMH
2. Graph Theory with application to engineering and computer science. Narsingh Deo, PHI.
3. S. C. Gupta – Fundamentals of Statistics, Himalaya Publishing House, Sixth Revised edition

Reference Books:
1. J.P. Tremblay and R. Manohar; Discrete Mathematical Structures with Applications to Computer Science, Tata Mc-Graw-Hill Edition, 1997.
2. J. E. Hopercroft and J D Ullman: Introductory Theory of Computer Science - Addison Wesley
3. Swapan Kumar chakraborty and Bikash Kanti Sarkar: Discrete Mathematics – OXFORD Higher Education

Paper No: **PS01CMBT26**
Paper Title: **Practical based on PS01CMBT22 and PS01CMBT23**