Structure for M.Sc. IT – CBCS Programme

Semester-III

COURSE NO.	SUBJECT CODE	COURSE TYPE	SUBJECT	CREDIT
201	23044	CORE	Data Warehousing & Data Mining	04
202	23045	CORE	Programming in Python	04
203	23046	CORE	NoSQL Database : MongoDB	04
204	23047	CORE	Artificial Intelligence	04
205(A)	23048	CORE	Practical-I	04
205(B)	23049	CORE	Practical-II	04
			TOTAL	24

M.Sc IT **Course: Data Warehousing & Data Mining** Course No: 201
Semester: 03 Type of Course : Core Course
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100
Credits: 04 Teaching Hours Per Week: 04

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction Of Data warehouse And Data Mart**	**15**	**18**
	• Operational and Informational Systems. • Concept of Data Warehouse ,Characteristics of Data Warehouse • DBMS vs. Data Warehouse • Data Warehouse System Architecture (Two and Three-Tiered) • Concept of Data Mart , Usage of Data Mart, Security in Data Mart • Data Warehouse and Data Mart		
Unit-2	**Online Analytical Processing**	**15**	**18**
	• OLTP AND OLAP SYSTEM, OLTP VS OLAP • TYPES OF OLAP: ROLAP, MOLAP,HOLAP • Comparison of ROLAP,MOLAP,HOLAP		
Unit-3	**ETL and Data Mining**	**15**	**17**
	• Concept of ETL(Extraction, Transformation and Loading of Data) • Comparison and Contradiction of Various ETL tools • Data Mining-Definition and Functionalities • Classification of DM Systems • DM Task Primitives • Integration of a Data Mining system with a Database or a Data Warehouse • Issues in DM, KDD Process		
Unit-4	**Data Mining Techniques and Advance Data Mining**	**15**	**17**
	• Data Mining Techniques • Data Processing (Data Cleaning, Integration and Transformation, Reduction) • Data mining Primitives and DMQL • Designing GUI based on a DMQL • Architecture of Data Mining System • Mining Text Data, Mining Spatial Databases, Mining WWW • Mining sequence Data: Time-Series, Symbolic Sequences, and Biological Sequences, Mining graphs and Network • Data Mining Application and Trends		

Reference Books

1. Data Mining – Concepts & Techniques; Jiawei Han & Micheline Kamber – First Indian Reprint 2002, Morgan Kaufmann publication.
2. Data Warehousing in the Real World; Sam Anahory & Dennis Murray; 1997, Pearson
3. Data Mining Techniques; Arun Pujar; 2001, University Press; Hyderbad.
4. Data Mining; Pieter Adriaans & Dolf Zantinge; 1997, Pearson
5. Data Warehousing, Data Miniing and OLTP; Alex Berson, 1997, McGraw Hill.
6. Data warehousing System; Mallach; 2000, McGraw

M.Sc IT **Course: Programming in Python** Course No: 202
Semester: 03 Type of Course : Core Course
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100
Credits: 04 Teaching Hours Per Week: 04

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction**	**15**	**18**
	• The Process of Computational Problem Solving, Python Programming Language • Python Data Types: Expressions, Variables and Assignments, Strings, List, Objects and Classes, Python Standard Library. • Imperative Programming: Python programs, Execution Control Structures, User-Defined Functions, Python Variables and Assignments, Parameter Passing.		
Unit-2	**Text Files**	**15**	**18**
	• Strings Formatted Output. • Files, Errors and Exception Handling. • Execution and Control Structures: if Statement, for Loop, Two Dimensional Lists, while Loop, More Loop Patterns, Additional Iteration Control Statements. • Containers and Randomness: Dictionaries, Other Built-in Container Types, Character Encoding and Strings, Module random, Set Data Type.		
Unit-3	**Object Oriented Programming, Objects and Their Use**	**15**	**17**
	• Fundamental Concepts, Defining a New Python Class • User-Defined Classes, Designing New Container Classes Overloaded Operators, Inheritance, User-Defined Exceptions. • Namespaces: Encapsulation in Functions, Global versus Local Namespaces, Exception Control Flow, Modules and Namespaces. • Software Objects, Turtle Graphics. • Modular Design: Modules, Top-Down Design, Python Modules.		
Unit-4	**Python GUI Programming (Tkinter)**	**15**	**17**
	• Recursion: Introduction to Recursion, Examples of Recursion. • Run Time Analysis, Searching, Iteration Vs Recursion, Recursive Problem Solving, Functional Language Approach. • Graphical User Interfaces: Basics of tkinter GUI Development. Event-Based tkinter Widgets, Designing GUIs, OOP for GUI. • The Web and Search: The World Wide Web, Python WWW API. • String Pattern Matching, Database Programming in Python.		

Reference Books

1. John V Guttag. “Introduction to Computation and Programming Using Python”, Prentice Hall of India
2. Ljubomir Perkovic, “Introduction to Computing Using Python: An Application Development Focus”, Wiley, 2012.
3. Charles Dierbach, “Introduction to Computer Science Using Python: A Computational Problem-Solving Focus”, Wiley, 2013

M.Sc IT **Course: NoSQL Database:MongoDB** Course No: 203
Semester: 03 Type of Course : Core Course
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100
Credits: 04 Teaching Hours Per Week: 04

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**NoSQL Database**	**15**	**18**
	• Concept of NoSQL Database. • History of NoSQL Database • Benefits of NoSQL Database • Types of Nosql Database:CouchDB,MongoDB,Cassandra,Hbase • NoSQL V/S SQL Database • Uses of NoSQL in Industry		
Unit-2	**MongoDB Basic-I**	**15**	**18**
	• Introduction of MongoDB. • Data Modeling in MongoDB • Basic terms :Database,Collection,Document. • MongoDB Datatypes • Create and Drop Database • Create and drop collection • Insert,Update and delete Document • Querying Document • MongoDB v/s RDBMS		
Unit-3	**Advance MongoDB and MongoDB Connectivity Using PHP**	**15**	**17**
	• Projection,Limiting ,Sorting Records • Indexing,Aggregation. • Concept of GridFS • Storing files in GridFS • Serving files from GridFS • Reading files in chunks • Connect and Select Database. • Create Collection • Insert Document, Find Document, Update Document, Delete Document		
Unit-4	**Database Management**	**15**	**17**
	• Database Administration • Security and authentication::Authentication Basic, How Authentication works • Replication and Sharding • Backup and Restore Database • Deployment		

Reference Books

1. MongoDB the definitive guide - O'Reilly Kristina Chodorow & Michal Dirolf
2. MongoDB in Action - Kyle Banker Manning Sheltar Island.
3. The definitive guide to MongoDB - NoSQL Database for cloud and desktop computing. -
4. Apress - Eelco Plugge, Peter membrey and Tim Hawkins
5. PHP and MongoDB Web Development Beginers guide - Rubayeet Islam - Open Source

M.Sc IT | **Course: Artificial Intelligence** | Course No: 204

Semester: 03 | Type of Course : Core Course

Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100

Credits: 04 | Teaching Hours Per Week: 04

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction and Symbolic Logic**	**15**	**18**
	• Introduction • History of AI and Application of AI • Objective of AI and Future of AI • AI and related fields • The AI problems and underlying assumptions		
Unit-2	**Knowledge Acquisition and Representation**	**15**	**18**
	• Introduction • Machine Intelligence • Knowledge Engineering • Knowledge Acquisition and Representation • Logical ,Procedural, Network and Structured Representation Scheme		
Unit-3	**Searching Techniques**	**15**	**17**
	• Introduction • Problem Representation, Definitions, Representation Scheme • Problem Solving using AI • Blind search Technique (BFS,UCS,DFS,DLS,IDS) • Heuristic Search Technique (Greedy Search, Hill Climbing Search, A* Search, Admissible Heuristics, The 8-Puzzle Problem, Brach and Bound) • Game Search (MINMAX Procedure, ALPHA-BETA Procedure)		
Unit-4	**Expert System**	**15**	**17**
	• Introduction (Definition , public Knowledge, Private Knowledge) • History of ES • Skill Versus Knowledge • Basic Characteristics of ES • Knowledge Engineering • Inferencing		

Reference Books

1. Rajendra Akerkar : Introduction to Artificial Intelligence Published by PHI
2. Rich and knight : Artificial Intelligence Published by TMH
3. Stuart Russell and Peter Norving : Artificial Intelligence Published by Pearson

M.Sc IT	**Course: Practical –I**	Course No: 205(A)
Semester: 03	Type of Course : Core Course	
Marking Scheme: External Examination: 100 + Internal Examination: 0 = 100		
Credits: 4		Teaching Hours Per Week: 8

	Detailed Syllabus	Teaching Hours	Marks/ Weight
1	**Practical –I : Practical Based on -202(Programming In Python)**	**120**	**100**

Paper 202: Practical Based on -202(Programming In Python) Questions Wise Distribution	Marks/ Weight
Q-1	**40**
Q-2	**30**
Q-3	**30**
TOTAL MARKS	**100**

M.Sc IT	**Course: Practical -II**	Course No: 205(B)
Semester: 03	Type of Course : Core Course	
Marking Scheme: External Examination: 100 + Internal Examination: 0 = 100		
Credits: 4		Teaching Hours Per Week: 8

	Detailed Syllabus	Teaching Hours	Marks/ Weight
1	**Practical -II: Practical Based on 203 (NoSQL Database: MongoDB)**	**120**	**100**

Paper 203: Practical Based on 203(NoSQL Database: MongoDB) Questions Wise Distribution	Marks/ Weight
Q-1	**40**
Q-2	**30**
Q-3	**30**
TOTAL MARKS	**100**

Structure for M.Sc. IT – CBCS Programme

Semester-IV

COURSE NO.	SUBJECT CODE	COURSE TYPE	SUBJECT	CREDIT
206	23050	CORE	Linux Operating system & Shell Programming	04
207	23051	CORE	Web Application Development Using ASP.Net	04
208	23052	CORE	Project Work	08
209	23053	CORE	Practical –I	04
210	23054	CORE	Practical -II	04
TOTAL				24

M.Sc IT **Course: Linux Operating System & Shell Programming** Course No: 206

Semester: 04 Type of Course : Core Course

Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100

Credits: 04 Teaching Hours Per Week: 04

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction**	**15**	**18**
	• History of UNIX Operating System Definition of Kernel, Shell, File, Process, System Calls. • Linux Operating System, Features of Unix and Linux Operating System, • Concept of Open Source Software, Application Area of Linux Operating System • Various Linux Flavors • Desktop Environment : (a) X Window Basics (b) KDE Basics (c) GNOME Basics • Terms and condition of Copying, Distribution and Modifications (Linux & GNU) • Advantages and Disadvantages of Linux		
Unit-2	**File Structure and Linux Shells , Bash Shell Programming**	**15**	**18**
	• Understanding File System Hierarchy Standard. • Directory Commands, File and Directory Commands: • Understanding Job (process). • Process Commands , User Commands, Misc Commands • Introduction to Vi Editors • Introduction to Shell : Korn, Bash, and C Shell With Their Difference • Variables in Shell, How to Print or Access Values in Shell, Echo Command. • Shell Arithmetic, Commands and Command Line Arguments, I/O Redirection • Structured Language Construct: If-else, else–if, Case Statement, Loops in Shell, • Arrays, Command Line Argument.		
Unit-3	**User Management**	**15**	**17**
	• GUI user management tools: User Admin and KUser • Password file, Managing User Environment • Adding and Removing Users with useradd, usermod and userdel • Managing Groups, Controlling Access to Directories and File using chmod		
Unit-4	**Networking concepts & Server configuration**	**15**	**17**
	• Basics of Network System, Basics of TCP/IP Networking, IP address, IP address • Class and Mask, Port Number, DNS, NFS Server Configuration • Telnet and FTP Server Fundamentals • Basics of Samba Server: Installation and Configuration		

Reference Books

1. Richard Petersen: The Complete Reference – 6th edition – McGraw Hill
2. Sumitabha Das: Concepts and Application of UNIX 4th edition – Tata McGraw Hill
3. Peter Nortons's: Complete Guide to Linux, Techmedia
4. Yashwant Kanitkar: Unix Shell Programing, BPB Publication

M.Sc IT **Course: Web Application Development Using ASP.Net** Course No: 207

Semester: 04 Type of Course : Core Course

Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100

Credits: 04 Teaching Hours Per Week: 04

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction**	**15**	**18**
	• Overview of ASP.Net Framework • ASP.NET Page Life Cycle Events • Installation of IIS Server, • Web Configuration (Web.Config, Machine.Config) • Introduction to Basic Controls: (Button, Textbox, Checkbox, Label, Listbox, Dropdownlist etc.)		
Unit-2	**Standard Controls**	**15**	**18**
	• Image Control • **Navigation Controls**: Menu, SiteMap Path, TreeView • FileUpload Control • Wizard Control & Panel Control • Calendar Control		
Unit-3	**Advance Controls**	**15**	**17**
	• Validation Controls • AdRotator Control • Overview of Login Controls • HTML Controls • Master Page –Steps to Create Master Page–Limitations of Master Page		
Unit-4	**Database Connectivity**	**15**	**17**
	• ADO.Net Architecture ,Connected and Disconnected Architecture • Overview : Command, Data Reader, Dataset, Data Adapter • Data Controls: GridView, DataList , DetailView, Repeater • Binding Data to Data Bound Controls. • Database Programming using Code.(Select, Insert, Update, Delete)		

Reference Books

1. ASP.Net Black Book Published by Dreamtech Press.
2. ASP.Net UNLEAHED By STEPHEN WALTHER
3. MASTERING ASP.Net WITH VB.Net By A.RUSSELL JONES.

M.Sc IT	**Course: Project**	Course No: 208
Semester: 04	Type of Course : Core Course	
Marking Scheme: External Examination: 200 [Project Report 100+ Project Presentation 100]		
Credits: 8		
	Detailed Syllabus	
	OBJECTIVE The objective of the project work is to develop quality software solution. During the development of the project, the student will be involved in all the stages of the software development life cycle like systems requirements specifications, systems analysis, systems design, software development, testing strategies and documentation with an overall emphasis on the development of reliable software systems. The primary emphasis of the project work is to understand and gain the knowledge of the principles of software engineering practices, so as to participate and manage a large software engineering projects in future.	
	General Instruction It is expected to work on a real-life project preferably in some industry/Research and Development Laboratories/Educational Institution/Software Company. However, it is ***not mandatory*** for a student to work on a real-life project. The student can formulate a project problem with the help of her/his College Guide and work on it, and complete it. Use of the latest versions of the software packages for the development is desired.	

M.Sc IT	**Course: Practical –I**	Course No: 209
Semester: 04	Type of Course : Core Course	
Marking Scheme: External Examination: 100 + Internal Examination: 0 = 100		
Credits: 4		Teaching Hours Per Week: 8

	Detailed Syllabus	Teaching Hours	Marks/ Weight
1	**Practical – I : Practical Based on -207 (Linux Operating System & Shell Programming)**	**120**	**100**

Practical Based on -207(Linux Operating System And Shell Programming) Questions Wise Distribution	Marks/ Weight
Q-1	**40**
Q-2	**30**
Q-3	**30**
TOTAL MARKS	**100**

M.Sc IT	**Course: Practical -II**	Course No: 210
Semester: 04	Type of Course : Core Course	
Marking Scheme: External Examination: 100 + Internal Examination: 0 = 100		
Credits: 4		Teaching Hours Per Week: 8

	Detailed Syllabus	Teaching Hours	Marks/ Weight
1	**Practical -II: Practical Based on -208 (Web Application Development Using ASP.Net)**	**120**	**100**

Practical Based on -208 (Web Application Development Using ASP.Net) Questions Wise Distribution	Marks/ Weight
Q-1	**40**
Q-2	**30**
Q-3	**30**
TOTAL MARKS	**100**