

**AC 6/6/2012**  
**Item No. 4.77**

# **UNIVERSITY OF MUMBAI**



**Syllabus for the**  
**M. C. A.**  
**(Master of Computer Application)**

(As per Credit Based Semester and Grading System  
with effect from the academic year 2012–2013)

**Program Structure for  
Master of Computer Application (MCA)  
Mumbai University  
(With Effect from 2012-2013)  
Semester I**

Subject Code	Subject Name	Teaching Scheme (Contact Hours)			Credits Assigned					
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total		
MCA101	Object Oriented Programming	04	--	--	04	--	--	04		
MCA102	Computer Organization and Architecture	04	--	--	04	--	--	04		
MCA103	Software Engineering	04	--	--	04	--	--	04		
MCA104	Discrete Mathematics	04	--	--	04	--	--	04		
MCA105	Principals and Perspective of Management	04	--	--	04	--	--	04		
L101	Lab I – Programming and S.E. Lab	--	06	--	--	03	--	03		
L102	Lab II – Web Technology & Web Project Development Lab	--	06	--	--	03	--	03		
<b>Total</b>		<b>20</b>	<b>12</b>	<b>--</b>	<b>20</b>	<b>06</b>	<b>--</b>	<b>26</b>		
Subject Code	Subject Name	Examination Scheme								
		Theory Course					Term Work	Pract.	Oral	Total
		Internal Assessment			End Sem. Exam.					
		Test1	Test 2	Avg.						
MCA101	Object Oriented Programming	20	20	20	80	--	--	--	100	
MCA102	Computer Organization and Architecture	20	20	20	80	--	--	--	100	
MCA103	Software Engineering	20	20	20	80	--	--	--	100	
MCA104	Discrete	20	20	20	80	--	--	--	100	

	Mathematics								
MCA105	Principals and Perspective of Management	20	20	20	80	--	--	--	100
L101	Lab I – Programming and S.E. Lab	--	--	--	--	25	50	25	100
L102	Lab II – Web Technology & Web Project Development Lab	--	--	--	--	25	50	25	100
<b>Total</b>		<b>100</b>	<b>100</b>	<b>100</b>	<b>400</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>700</b>

**Program Structure for  
Master of Computer Application (MCA)  
Mumbai University  
(With Effect from 2012-2013)**

**Semester II**

Subject Code	Subject Name	Teaching Scheme (Contact Hours)			Credits Assigned					
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total		
MCA201	Data Structure	04	--	--	04	--	--	04		
MCA202	Operating System	04	--	--	04	--	--	04		
MCA203	Computer Network	04	--	--	04	--	--	04		
MCA204	Probability and Statistics	04	--	--	04	--	--	04		
MCA205	Financial Accounting	04	--	--	04	--	--	04		
L201	Lab I – Programming and Statistical Lab	--	06	--	--	03	--	03		
L202	Lab II – Operating System and DCN Lab	--	06	--	--	03	--	03		
<b>Total</b>		<b>20</b>	<b>12</b>	<b>--</b>	<b>20</b>	<b>06</b>	<b>--</b>	<b>26</b>		
Subject Code	Subject Name	Examination Scheme								
		Theory Course					Term Work	Pract.	Oral	Total
		Internal Assessment			End Sem. Exam.					
		Test1	Test 2	Avg.						

MCA201	Data Structure	20	20	20	80	--	--	--	100
MCA202	Operating System	20	20	20	80	--	--	--	100
MCA203	Computer Network	20	20	20	80	--	--	--	100
MCA204	Probability and Statistics	20	20	20	80	--	--	--	100
MCA205	Financial Accounting	20	20	20	80	--	--	--	100
L201	Lab I – Programming and Statistical Lab	--	--	--	--	25	50	25	100
L202	Lab II – Operating System and DCN Lab	--	--	--	--	25	50	25	100
<b>Total</b>		<b>100</b>	<b>100</b>	<b>100</b>	<b>400</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>700</b>

**SEMESTER I**

Subject Code	Subject Name	Teaching Scheme (Contact Hours per week)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
MCA101	<b>Object Oriented Programming</b>	04	--	--	04	--	--	04
<b>Examination Scheme</b>								
<b>Theory</b>					<b>Term Work</b>	<b>Pract.</b>	<b>Oral</b>	<b>Total</b>
<b>Internal Assessment</b>			<b>End Sem. Exam. [ Once in a semester ]</b>					
<b>Test1</b>	<b>Test 2</b>	<b>Avg.</b>						
20	20	20	80		--	--	--	100

Unit	Contents	Hrs
1	<b>C++ Fundamentals:</b> Data types, Operators, Preprocessor directives, Declarations, Input & Output, control structures, structures, functions and arrays.	4 Hrs
2	<b>Functions:</b> Concept of function in C++, function prototypes in C++, function with parameters, Returning values From Functions. Reference Arguments, Overloaded Function, Default Arguments. Returning By Reference.	3 Hrs
3	<b>Object oriented programming, Object And Classes:</b> -Characteristics of object oriented programming, Making sense of core object concepts (Encapsulation Abstraction, Polymorphism, Classes, Massages Association, Inheritance) Implementation of Class in C++, C++ Objects As Physical Object, C++ Object As Data Types, Constructor, Object As Function Arguments. The Default constructor, Copy Constructor, Returning Object From Function. Structures And Classes. Inline	8 Hrs

functions, static, virtual and friend function. Classes Objects And Memory Static Class Data. Const Data. Const And Classes.

- 4 **Arrays and String:** Arrays Fundamentals. Arrays as Class Member Data. Arrays Of Object. String. The Standard C++ String Class. *4 Hrs*
- 5 **Operator Overloading:** Overloading Unary Operators. Overloading. Binary Operators. Data Conversion. Pitfalls of Operators Overloading And Conversion. Keywords Explicit And Mutable *4 Hrs*
- 6 **Inheritance:** Concept of Inheritance, Derived Class And Base Class, Derived Class Constructors, Overriding Member Function, Class Hierarchies, Public And Private Inheritance, Levels Of Inheritance, Multiple Inheritance, Ambiguity In Multiple Inheritance, Aggregation: Classes Within Classes, Inheritance And program Development. *4 Hrs*
- 7 **Pointer.** Addresses And pointer, The Address-Of Operator “&”, Pointer And Arrays, Pointer And Function, Pointer And C- Types String, Memory Management: New And Delete operator, Pointers to Objects, Debugging pointers. *4Hrs*
- 8 **Virtual Function and Polymorphism** *4Hrs*  
Virtual Function, Assignment And Copy Initialization, this Pointer, Dynamic Type Information.
- 9 **Streams and Files.** *5 Hrs*  
Streams Classes. Stream Errors. Disk File I/O with Streams, File Pointers, Error Handling In File I/O, File I/O With Member Function, Overloading the Extraction And Insertion Operators, Memory As A Stream Object, Command line Arguments, and Printer Output.
- 10 **Templates And Exceptions** *2Hrs*  
Function Templates, Class Templates Exceptions.
- 11 **The Standard Template Library** *3Hrs*  
Introduction Algorithms, Sequence Containers, Iterators, Specialized Iterators, Associative Containers, Storing User- Defined Object, Function Objects.
- 12 **References :-**

1. Object Oriented Programming in-C++ By Robert Lafore Techmedia Publication
2. The Complete Reference C ++ - By Herbert Sehlidt Tata Megraw-hill publication
3. Object Oriented Programming in C++ Saurav Sahay Oxford University Press
4. Object Oriented Programming and C++ R. Rajaram New Age International Publishers 2nd
5. OOPS C++ Big C++ Cay Horstmann Wiley Publication
6. C++ How to Program, 8/E Paul Deitel & Harvey Deitel

Subject Code	Subject Name	Teaching Scheme (Contact Hours per week)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
MCA102	Computer Organization and Architecture	04	--	--	04	--	--	04
<b>Examination Scheme</b>								
<b>Theory</b>					<b>Term Work</b>	<b>Pract.</b>	<b>Oral</b>	<b>Total</b>
<b>Internal Assessment</b>			<b>End Sem. Exam. [ Once in a semester ]</b>					
<b>Test1</b>	<b>Test 2</b>	<b>Avg.</b>						
20	20	20	80		--	--	--	100

Unit	Contents	Hrs
1	<b>DIGITAL LOGIC</b> <b>Number system</b> Boolean Algebra, Logic Gates Combinational Circuits Implementation of Boolean Functions Algebraic Simplification Karnaugh maps Multiplexers / Demultiplexers Decoders / Encoders Adders :Half, Full Sequential Circuits Flip- Flops: S-R, J-K, D Registers: Parallel, Shift Counters: Ripple, Synchronous	6 hrs
2	<b>THE COMPUTER SYSTEM</b> Computer function and Interconnection Computer functions	12 hrs

- Interconnection Structures
  - Bus Interconnection
- Memory System Design
  - Memory hierarchy and SRAM
  - Advanced DRAM Organisation
  - Interleaved and Associative memory
  - Nonvolatile memory
  - RAID
- Cache Memory
  - Cache memory Principles
  - Elements of Cache design
  - Improving Cache Performance
- Input / Output
  - Programmed I/O
  - Interrupt-driven I/O
  - Direct Memory Access
- I/O Channels and Processors

**3 CENTRAL PROCESSING UNIT**

12 hrs

- Instruction Set: characteristics & functions
  - Machine Instruction characteristics
  - Type of Operands
  - Types of Operations
- Instruction set : addressing modes & formats
  - Addressing
  - Instruction Formats
- CPU structure and Function
  - Processor Organization
  - Register Organization
  - Instruction Cycle
  - Instruction Pipelining
- Instruction Level Parallelism and Superscalar Processors
  - Superscalar versus super pipelined
  - Limitations
  - Instruction level parallelism and machine parallelism
  - Instruction issue policy
  - Register Renaming
  - Branch Prediction
  - Superscalar Execution
  - Superscalar Implementation
- Example: 8086 and Pentium Processor

**4 CONTROL UNIT**

4 hrs

- Control Unit Operation
  - Micro-operations
  - Control of the processor

Hardwired Implementation  
Microprogrammed Control (Basic concepts )

- 5 MULTIPROCESSOR ORGANISATION** 6 hrs
- Multiprocessor organizations
    - UMA, NUMA NORMA, Distributed memory
    - Types of Parallel Processor Systems
    - Parallel organizations
  - Symmetric Multiprocessors
    - Organization
    - Interconnection networks
      - single bus, crossbar, mesh, tree & ring network
  - Clusters
    - Cluster Configurations
    - Cluster Computer Architecture
  - Cloud computing
- 6 Case Study:** 2 hrs
- Processor Specification & Design**

**References Books:**

1. Digital Computer Fundamentals, Bartee C. Thomas , McGraw-Hill International Edition
2. Computer Architecture by Nicholas Carter , Schaum's outlines, McGraw-Hill
3. Computer Organization by Hamacher C., Zaky S. McGraw Hill
4. Computer Organisation and Architecture: Stallings, W Prentice Hall of India, New Delhi
5. Computer Architecture, Behrooz Parhami, Oxford University Press
6. Digital Computer Fundamentals, Bartee C. Thomas , McGraw-Hill International Edition
7. Computer Fundamentals Architecture & Organization B. Ram New Age
8. Computer Organization I.S.R.D.group Tata Mc Graw Hill



Subject Code	Subject Name	Teaching Scheme (Contact Hours per week)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
MCA103	Software Engineering	04	--	--	04	--	--	04
<b>Examination Scheme</b>								
<b>Theory</b>					<b>Term Work</b>	<b>Pract.</b>	<b>Oral</b>	<b>Total</b>
<b>Internal Assessment</b>			<b>End Sem. Exam. [ Once in a semester ]</b>					
<b>Test1</b>	<b>Test 2</b>	<b>Avg.</b>						
20	20	20	80		--	--	--	100

Unit	Contents	Hrs
<b>1</b>	Software Engineering: The evolving role of software What is Software engineering? Changing nature of software Software Myths.	<b>4Hrs</b>
<b>2</b>	<b>Approaches to system development</b>  SDLC Different models their advantages and disadvantages <ul style="list-style-type: none"> <li>○ Waterfall approach</li> <li>○ Iterative approach</li> <li>○ Extreme programming</li> <li>○ Rad model, JAD</li> <li>○ Unified process</li> <li>○ Evolutionary software process model <ul style="list-style-type: none"> <li>▪ Incremental model</li> <li>▪ Spiral model</li> </ul> </li> </ul> Concurrent development model Agile Model	<b>5 Hrs</b>
<b>3</b>	<b>Software Analysis and Design</b>  Activities of the analysis phase Fact finding methods <ul style="list-style-type: none"> <li>○ Review existing reports forms and procedure descriptions</li> <li>○ Conduct interviews</li> <li>○ Observe &amp; document business processes</li> <li>○ Build prototypes</li> <li>○ Questionnaires</li> <li>○ Conduct jad sessions</li> </ul>	<b>8 Hrs</b>

Validate the requirements

- Structured walkthroughs

Feasibility Analysis: Types of feasibilities, Cost- benefit analysis, Payback analysis, ROI analysis, cash flow analysis.

### **Requirement Engineering**

Software engineering task

Requirement elicitation techniques

Software Requirements Specification (SRS)

Software requirements: functional and non- functional domain

Requirement characteristics and characterization

Requirement qualities, requirement specification, requirement traceability,

Requirement prioritization

- |          |  |               |
|----------|--|---------------|
| <b>4</b> | <b>Software Project Planning:</b><br><br>Size Estimation<br>Cost Estimation<br>Models<br>COCOMO, COCOMO-II   | <b>6 Hrs.</b> |
| <b>5</b> | <b>Software Scheduling and Tracking</b><br>Relationship between people and Effort: Staffing Levci Estimation, Effect of schedule Change on Cost<br>Selecting Software Engineering Tasks: Degree of Rigor, Task set selector, Task Network<br><br>Schedules: Work breakdown Structure. Task Network/Activity Networks, Gantt Charts, PERT Charts, CPM | <b>6 Hrs.</b> |
| <b>6</b> | <b>Design phase activities</b><br>Develop system flowchart<br>Structure chart <ul style="list-style-type: none"><li>○ Transaction analysis</li><li>○ Transform analysis</li></ul> Software design and documentation tools<br>Hipo chart<br>Warnier orr diagram<br>Designing databases<br>Entities<br>Relationships<br>Attributes<br>Normalization    | <b>6 Hrs.</b> |
| <b>7</b> | <b>Software Quality</b><br>Software Quality Management Systems<br>Software Quality Assurance<br>Software reviews<br>Formal Technical Reviews<br>Overview of ISO 9001 , SEI Capability Maturity Model, Mc Calls Quality   | <b>3 Hrs</b>  |

- Model
- 8 Software Reliability and Maintenance** **5 Hrs**
- Software Reliability
  - Reliability Metrics
  - Reliability Growth Modeling
  - Software Reverses Engineering
  - Software Maintenance Costs
  - Estimation of Maintenance Costs

**References:**

1. Software Engineering- A Practioner’s Approach”, Seventh Edition , Pressman R.S, Tata McGraw Hill Publication.
2. “ Software Engineering” : PankajJalote.
3. “Software Engineering Concepts”, Richard Fairley,Tata McGraw Hill Publication.
4. “Software Engineering – Principles and Practice”, Waman S. Jawadekar, Tata McGraw Hill Publication.
5. System Analysis and Design- Elias M. Awad
6. System Analysis and Design- in a changing world –John Satzinger, Robert Jackson, Stephen Burd

Subject Code	Subject Name	Teaching Scheme (Contact Hours per week)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
MCA104	Discrete Mathematics	04	--	--	04	--	--	04
<b>Examination Scheme</b>								
<b>Theory</b>					<b>Term Work</b>	<b>Pract.</b>	<b>Oral</b>	<b>Total</b>
<b>Internal Assessment</b>			<b>End Sem. Exam. [ Once in a semester ]</b>					
<b>Test1</b>	<b>Test 2</b>	<b>Avg.</b>						
20	20	20	80		--	--	--	100

<b>Unit</b>	<b>Contents</b>	<b>Hrs</b>
<b>1 Mathematical logic</b>	Propositions and logical operations Conditional Statements Methods of Proof Mathematical Induction Mathematical Statements Logic and Problem Solving Normal Forms Theory of Inference of statement calculus and predicate calculus	9 Hrs
<b>2 Relations</b>		9 Hrs

Product sets and partitions  
Relations and digraphs  
Paths in Relations and Digraphs  
Properties of Relations  
Equivalence Relations  
Operations on Relations  
Partially Orders Sets, Hasse diagram

**3 Semigroups and Groups** 7 Hrs

Semigroups, Monoids  
Products and Quotients of Semigroups  
Groups  
Products and Quotients of Groups

**4 Groups and Coding** 4 Hrs

Coding of Binary Information and Error Detection  
Decoding and Error Correction

**5 Recurrence Relations** 8 Hrs

Tower of Hanoi  
Iterations  
Homogenous linear equations with constant coefficients  
Particular Solution, Total Solution, Generating function  
Line in a plane in general position  
Divide and Conquer Recurrence Relations (Fast Multiplication of Integers,  
Fast matrix Multiplication)

**6 Graphs** 5 Hrs

Graph  
Representation of Graph  
Adjacency matrix, Adjacency list  
Euler paths and Circuits  
Hamiltonian Paths and Circuits

**7 Language and Finite State Machines** 3 Hrs

Languages  
Finite-State Machines

**References**

1. Discrete Mathematical Structures for Computer S Science by Kolman B and Bushy R
2. Discrete Mathematical Structures with applications to Computer Science by Tremblay and Manohar
3. Discrete Mathematics by C L Liu

4. Discrete Mathematics by Rosen
5. Discrete Mathematics by Johnsonbaugh, 6<sup>th</sup> ed.

Subject Code	Subject Name	Teaching Scheme (Contact Hours per week)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
MCA105	Principals and Perspective of Management	04	--	--	04	--	--	04
<b>Examination Scheme</b>								
<b>Theory</b>					<b>Term Work</b>	<b>Pract.</b>	<b>Oral</b>	<b>Total</b>
<b>Internal Assessment</b>			<b>End Sem. Exam.</b>					
<b>Test1</b>	<b>Test 2</b>	<b>Avg.</b>	<b>[ Once in a semester ]</b>					
20	20	20	80		--	--	--	100

Unit	Contents	Hrs
<b>1</b>	<b>Nature and functions of management:</b> importance of management, definition of management, management functions, development of management thought, contribution of F. W. Taylor, Henri Fayol, Elton Mayo, system contingency approaches to management	5 hrs
<b>2</b>	<b>Planning :</b> nature of planning, importance, forms, types of planning, steps in planning, making planning effective, planning skills, strategic planning in the Indian industry	5 hrs
<b>3</b>	<b>Decision-making:</b> meaning, types, steps in rational decision-making, environment of decision-making, common difficulties in decision-making	5 hrs
<b>4</b>	<b>Organization &amp; authority delegation and decentralization:</b> meaning, process of organizing, span of management, principles of organizing, organization structure, authority, responsibility. Role and Importance of Control Process, Budgeting and Variance Analysis .	7 hrs
<b>5</b>	<b>Motivation &amp; Leadership:</b> meaning and Maslow, Herzberg and Macgregor's theory of motivation, meaning of leadership, characteristics of leadership, approaches to leadership, theories of leadership	5 hrs
<b>6</b>	<b>Staffing &amp; training and development:</b> importance and need for proper staffing, recruitment, selection, placement, induction, types of training programmes, methods and selection of training method, training practices in India.	5 hrs
<b>7</b>	<b>Performance appraisal &amp; compensation plan:</b> purpose of appraisal, criteria of PA, PA methods, primary compensation, incentive compensation, pay-for-performance, non-monetary incentives.	5hrs

- 8 Marketing:** Understanding the concept of marketing, marketing mix, Product policy, New product development, Product life cycle, Channels of distribution, Marketing research. 5 hrs

**Reference books:**

1. Principles & Practice of Management : L.M.Prasad
2. Principles of management: P.C. Tripathi and P.N. Reddy 4th edition, TMH
3. Marketing Management , Rama Swamy, Nama Kumari
4. Essential of Management , Koontz O'Donnell
5. HR & Personnel Management , Ashwathappa

Subject Code	Subject Name	Teaching Scheme (Contact Hours per week)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
L101	Programming and S.E. Lab	--	06	--	--	03	--	03
	Programming Lab		04			02		
	S.E. Lab		02			01		
<b>Examination Scheme</b>								
<b>End Sem. Exam. [ Once in a semester]</b>								
<b>Laboratory Name</b>					<b>Term Work</b>	<b>Pract.</b>	<b>Oral</b>	<b>Total</b>
L101	<b>Programming and Project Development Lab</b>				<b>25</b>	<b>50</b>	<b>25</b>	<b>100</b>
	Programming Lab				15	25	15	55
	S.E. Lab				10	15	10	35
	Journal/Documentation					10 (5+5)		10

**Session** **Contents** **Hrs**

**C++ Programming Lab:**

- |           |   |              |
|-----------|---|--------------|
| <b>1</b>  | Assignment based on control structures, structures, functions | <b>3 hr</b>  |
| <b>2</b>  | Assignment based on Arrays and String                         | <b>3 hr</b>  |
| <b>3</b>  | Assignment based on Operator Overloading, Object And Classes  | <b>3 hr</b>  |
| <b>4</b>  | Assignment based on Inheritance                               | <b>3 hr</b>  |
| <b>5</b>  | Assignment based on Pointer                                   | <b>3 hr</b>  |
| <b>6</b>  | Assignment based on Virtual Function and Polymorphism         | <b>3 hr</b>  |
| <b>7</b>  | Assignment based on Streams and Files                         | <b>4 hr</b>  |
| <b>8</b>  | Assignment based on Templates And Exceptions                  | <b>4 hr</b>  |
| <b>9</b>  | Assignment based on The Standard Template Library             | <b>4 hr</b>  |
| <b>10</b> | <b>Mini project in C++</b>                                    | <b>10 hr</b> |

**Software Engineering Lab:**

- 1 Introduction to Software Engineering CASE tools.** **2 Hrs**
- 2 Creating a Project Plan or WBS**
  - Establishing the Project Start or Finish Date
  - Entering Tasks
  - Attach Supporting Information
  - Entering Task Durations
  - Setting Task Constraints (Milestones)
  - Gantt chart
  - Pert/CPM chart**3 Hrs**
- 3 Working with**
  - Degree of Rigor, Task set selector, Task Network
  - Estimate the Man power effort required for a project.
  - Calculate size the project.**3 Hrs**
- 4 Managing Project Cost** **3 Hrs**
- 5 Solving examples using COCOMO and COCOMO II models** **3 Hrs**
- 6 Case studies on Quality Standards.** **3 Hrs**
- 7 Case Study of any sample Project using MS Project** **3 Hrs**

Subject Code	Subject Name	Teaching Scheme (Contact Hours per week)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
L102	<b>Lab II – Web Technology &amp; Web Project Development Lab</b>	--	<b>06</b>	--	--	<b>03</b>	--	<b>03</b>
	Web Technology Lab		04			02		
	Web Project Development Lab		02			01		
<b>Examination Scheme</b>								
<b>End Sem. Exam. [ Once in a semester]</b>								
<b>Laboratory Name</b>					<b>Term Work</b>	<b>Pract.</b>	<b>Oral</b>	<b>Total</b>

L102	<b>Lab II – Web Technology &amp; Web Project Development Lab</b>	<b>25</b>	<b>50</b>	<b>25</b>	<b>100</b>
	Web Technology Lab	15	25	15	55
	Web Project Development Lab	10	15	10	35
	Journal/Documentation		10 (5+5)		10

<b>Session</b>	<b>Contents</b>	<b>Hrs</b>
<b>1</b>	<p><b>Introduction to the Web</b></p> <p>Web Browser, Web Server, XAMPP, Web Development Cycle</p> <p>Web publishing, Static Web contents, Dynamic Web contents</p> <p><b>Introduction to HTML</b></p> <p>HTML fundamentals, HTML Tags, Elements and Attributes</p> <p>Structure of HTML code, Lists</p> <p>Block Level tags</p> <p>Block formatting, Heading, Paragraph, Comments, Text alignments and Font size.</p> <p>Text Level tags</p> <p>Bold Italic, Underlined, Strikethrough, Superscript, Subscript</p> <p>(Lab Assignment: Develop web pages based on above tags)</p>	<b>6 hrs</b>
<b>2</b>	<p><b>HTML</b></p> <p>Inserting graphics, Linking and Scaling images.</p> <p>Table, Frameset, Forms</p> <p>(Lab Assignment: Develop web pages based on above tags)</p>	<b>6 hrs</b>
<b>3</b>	<p><b>Cascading Style Sheets</b></p> <p>The usefulness of Style Sheets, Creating Style sheets, Classes and Pseudo Classes, CSS Tags</p> <p>(Lab Assignment: Develop small website based on above HTML tags &amp; by using CSS)</p>	<b>6 hrs</b>
<b>4</b>	<p><b>PHP</b></p> <p>PHP Essentials, Installation and Configuration files</p> <p>Variables, constants, Operators, Control Structures,</p>	<b>6 hrs</b>



	(Lab Assignment: Develop small web application based on above Syllabus)	
<b>5</b>	<b>PHP</b> Strings, Array	<b>6 hrs</b>
	(Lab Assignment: Develop small web application based on above Syllabus)	
<b>6</b>	<b>PHP</b> Functions , Built-in PHP Function Libraries, Forms	<b>6 hrs</b>
	(Lab Assignment: Develop small web application based on above Syllabus)	
<b>7</b>	<b>PHP</b> Data Validation, File Handling (Including and Requiring Files, Reading and Writing Files, Allowing Users to Download Files)	<b>6 hrs</b>
	(Lab Assignment: Develop small web application based on above Syllabus)	
<b>8</b>	<b>MYSQL</b> Introduction about Database, Data Types, DML, DDL, Aggregate functions Data Time functions	<b>6 hrs</b>
	(Lab Assignment: Develop small web application based on above Syllabus)	
<b>9</b>	<b>PHP</b> PHP ODBC, Sessions, Cookies, FTP, GET and POST data, HTTP Headers, HTTP Authentication	<b>6 hrs</b>
	(Lab Assignment: Develop small web application based on above Syllabus)	
<b>10</b>	<b>PHP</b> GET and POST data, HTTP Headers, HTTP Authentication	<b>6 hrs</b>
	(Lab Assignment: Develop small web application based on above Syllabus)	

**Reference Books:**

1. Textbook of Web Design – Joel Sklar, Cengage Learning
2. HTML: The Complete Reference – Thomas A. Powell
3. Web Technologies – Uttam K. Roy, Oxford
4. Head First PHP and MySQL- O'Reilly Publication
5. PHP: The Complete Reference – Steven Holzner
6. PHP and MySQL Web Development (3rd Edition)- Luke Welling, Laura Thomson
7. Developing Web Applications, Ralph Moseley, WSEwiley
8. PHP for the Web: Visual QuickStart Guide, 4/e - Larry Ullman, Pearson