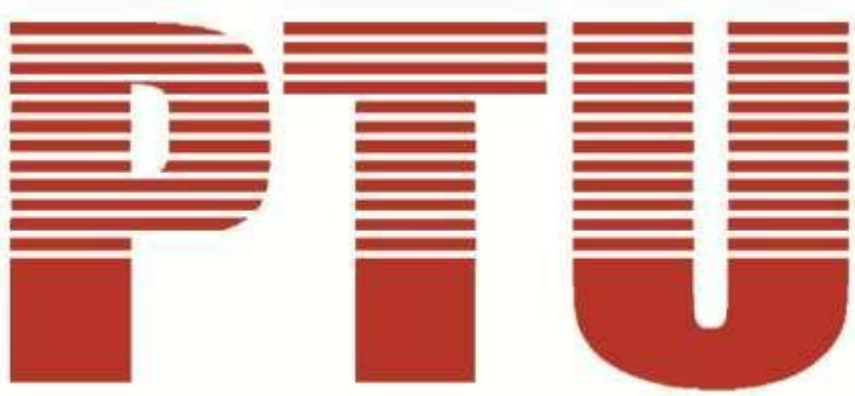
Scheme & Syllabus of

Bachelor in Mobile Computing & Internet

(BMCI)

Batch 2014



By

Department of Academics

Punjab Technical University

Punjab Technical University

Bachelor in Mobile Computing & Internet Batch 2014 onwards

Bachelor In Mobile Computing & Internet: It is a Under Graduate (UG) Programme of 3 years duration (6 semester)

Eligibility For Admission: +2 in Any Stream

Courses & Examination Scheme:

First Semester

Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
BMCI101	Mathematics – I	3	1	-	40	60	100	4
BMCI102	Communication	3	1	-	40	60	100	4
HVPE101	Human Value & Professional Ethics	3	-	-	40	60	100	3
BMCI103	Information Technology	4	1	-	40	60	100	5
BMCI104	Programming In C	4	1	-	40	60	100	5
BMCI105	Software Lab – I (IT)	-	-	4	60	40	100	2
BMCI106	Software Lab – I (Programming In C)	-	-	4	60	40	100	2

Second Semester

Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
BMCI201	Mathematics - II	3	1	-	40	60	100	4
EVSC101	Environmental Science	3	-	-	40	60	100	3
BMCI202	System Analysis & Design	3	1	-	40	60	100	4
BMCI203	Object Oriented Programming with C++	4	1	-	40	60	100	5
BMCI204	Data Base Management System	4	1	-	40	60	100	5
BMCI205	Software Lab – III (OOPS Using C++)	-	-	4	60	40	100	2
BMCI206	Software Lab – IV (DBMS)	-	-	4	60	40	100	2

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Third Semester

Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
BMCI301	Relational Data Base Management System	3	1	-	40	60	100	4
BSBC302	Data Structures	4	1	-	40	60	100	5
BSBC602	Computer Graphics	3	1	-	40	60	100	4
BMCI302	Fundamental of Internet Technology	3	1	-	40	60	100	4
BSBC603	Computer Networks	3	1	-	40	60	100	4
BSBC605	Software Lab – V (Computer Graphics)	-	-	4	60	40	100	2
BMCI303	Software Lab – VI (Internet Technology)	-	-	4	60	40	100	2

Fourth Semester

Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
BMCI401	Advance Web Development	3	1	-	40	60	100	4
BSBC502	Programming In Java	4	1	-	40	60	100	5
BMCI402	Mobile Commerce	3	1	-	40	60	100	4
BMCI403	Linux Operating System	3	1		40	60	100	4
BMCI404	Software Engineering	3	1	-	40	60	100	4
BMCI405	Software Lab – VII (Advance Web Development)	-	-	4	60	40	100	2
BSBC505	Software Lab – VIII(Programming In Java)	-	-	4	60	40	100	2

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Fifth Semester

Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
BMCI501	Mobile Application Development	3	1	-	40	60	100	4
BMCI502	Programming in PHP	3	1	-	40	60	100	4
BMCI503	Software Testing and Quality Assurance	3	1	-	40	60	100	4
BMCI504	Data Warehousing and Mining	4	1	-	40	60	100	5
BMCI505	Information Security	3	1	-	40	60	100	4
BMCI506	Software Lab – VIII (Mobile Application Development)	-	-	4	60	40	100	2
BMCI507	Software Lab – IX (Programming In PHP)	-	-	4	60	40	100	2

Sixth Semester

Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
BMCI601	Mobile Cloud Computing	4	1	-	40	60	100	5
BMCI602	Project Management	4	1	-	40	60	100	5
BMCI603	Mobile Adhoc Network	4	1	-	40	60	100	5
BMCI604	Major Project (Android/JAVA)	-	-	6	120	80	200	6
BMCI605	Seminar	-	-	4	100	-	100	4

Semester First

MATHEMATICS – I (BMCI101)

SECTION-A

SET THEORY AND RELATIONS

Sets- Elements of a set, methods of describing a set, types of sets, Operations on sets-- union, intersection and difference of sets, Venn diagrams, statement problems, Associative Laws, Distributive laws, DeMorgan‟s laws, duality, partitioning of a set.
Relation -Basic definition of relation and types of relations, graphs of relations, properties of relations, (domain, range, inverse and composite relations), Matrix representation of a relation.

SECTION-B

ALGEBRA OF LOGIC, MATHEMATICAL INDUCTION

Propositions and Logic operations, truth tables, arguments and validity of arguments, propositions generated by a set, equivalence and implication laws of logic, mathematical system and propositions over a universe, Quantifiers, Principle of Mathematical Induction.

SECTION-C

GRAPH THEORY

Various types of graphs- Simple and multi graphs, directed and undirected graphs, Eulerian and Hamiltonian graphs, Graph connectivity, graph traversals, graph optimizations, graph coloring, Trees, spanning trees.

SECTION-D

RECURSION AND RECURRENCE RELATIONS

Recursion, many faces of recursion, recurrence relations, some common recurrence relations, Matrix Operations: Adittion, Subtraction, Multipication and Inverse

COMMUNICATION (BMCI102)

SECTION-A
English Language: Sentence, Parts of speech, Tenses, Active passive voice, Direct Indirect speech, Creative writing& vocabulary, Comprehension passage, Reading of biographies of at least 10 IT business personalities (can be a home assignment or classroom reading).

SECTION-B
Business communication-Types, Medias, Objectives, Modals, Process, Importance Understanding Barriers to communication & ways to handle and improve barriers.

SECTION-C
Presentation skills-Its Purpose in business world, How to find material for presentation, How to sequence the speech with proper introduction and conclusion, How to Prepare PPT& Complete set of required body language while delivering presentation.
Reading & writing skills- Importance of reading and writing, improving writing skills through understanding and practicing Notice, E-mail, Tenders, Advertisement, formal letter.

SECTION-D
Listening skills-Its importance as individual and as a leader or as a worker, Its types, barriers to listening & remedies to improve listening barriers.
Non verbal Communication- understanding what is called non verbal communication, its importance as an individual, as a student, as a worker and as a leader, its types.

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HUMAN VALUES & PROFESSIONAL ETHICS (HVPE101)

SECTION- A

Course Introduction – Need, Basic Guidelines, Content and Process for Value Education

- Understanding the need, basic guidelines, content and process for Value Education.
- Self Exploration–what is it?- its content and process; „Natural Acceptance‟ and Experiential Validation- as the mechanism for self exploration.
- Continuous Happiness and Prosperity- A look at basic Human Aspirations
- Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
- Method to fulfill the above human aspirations: understanding and living in **harmony** at various levels

Understanding Harmony in the Human Being – Harmony in Myself!

- Understanding human being as a co-existence of the sentient „I‟ and the material „Body‟
- Understanding the needs of Self („I‟) and „Body‟ – *Sukh* and *Suvidha*
- Understanding the Body as an instrument of „I‟ (I being the doer, seer and enjoyer)
- Understanding the characteristics and activities of „I‟ and harmony in „I‟
- Understanding the harmony of I with the Body: *Sanyam* and *Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail
- Programs to ensure *Sanyam* and *Swasthya* **(7)**

Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

- Understanding harmony in the Family- the basic unit of human interaction
- Understanding values in human-human relationship; meaning of *Nyaya* and program for its fulfillment to ensure *Ubhay-tripti*; Trust (*Vishwas)* and Respect (*Samman)* as the foundational values of relationship
- Understanding the meaning of *Vishwas*; Difference between intention and competence
- Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship
- Understanding the harmony in the society (society being an extension of family): *Samadhan, Samridhi, Abhay, Sah-astitva* as comprehensive Human Goals
- Visualizing a universal harmonious order in society- Undivided Society (*Akhand Samaj),* Universal Order (*Sarvabhaum Vyawastha)*- from family to world family!

PART B

Understanding Harmony in the Nature and Existence – Whole existence as Co-existence

- Understanding the harmony in the Nature
- Interconnectedness and mutual fulfillment among the four orders of naturerecyclability and self-regulation in nature
- Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space
- Holistic perception of harmony at all levels of existence

Implications of the above Holistic Understanding of Harmony on Professional Ethics

- Natural acceptance of human values
- Definitiveness of Ethical Human Conduct
- Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
- Competence in professional ethics:
  - Ability to utilize the professional competence for augmenting universal human order
  - Ability to identify the scope and characteristics of people-friendly and ecofriendly production systems
  - Ability to identify and develop appropriate technologies and management patterns for above production systems.
- Case studies of typical holistic technologies, management models and production systems
- Strategy for transition from the present state to Universal Human Order:
  - At the level of individual: as socially and ecologically responsible engineers, technologists and managers
  - At the level of society: as mutually enriching institutions and organizations

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Information Technology (BMCI103)

SECTION- A

Computer Fundamentals: Block structure of a computer, characteristics of computers, problem solving with computers, generations of computers, and classification of computers on the basis of capacity, purpose, and generation.
Number System: Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, representation of characters, integers and fractions.
Binary Arithmetic: Addition, subtraction and multiplication.

SECTION-B

Memory Types: Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory.
Input and Output Units: Keyboard, Mouse, Monitor (CRT and LCD): Light pen, joystick, Mouse, Touch screen; OCR, OMR, MICR
Overview of storage devices: Floppy disk, hard disk, compact disk, tape.
Printers: Impact, non-impact, working mechanism of Drum printer, Dot Matrix printer, Inkjet printer and Laser printer.
Computer languages: Machine language, assembly language, higher level language, 4GL. Introduction to Compiler, Interpreter, Assembler, Assembling, System Software, Application Software.

SECTION- C

Operating system: Batch, multi-programming, time sharing, network operating system, on-line and real time operating system, Distributed operating system, multi-processor, Multi-tasking.
Graphical OS: Fundamentals of windows, types of windows, anatomy of windows, windows explorer, customizing windows, control panel, taskbar setting, Network Neighborhood.
Personal Productivity Software:
Word processing: Editing features, formatting features, saving, printing, table handling, page settings, spell-checking, macros, mail-merge, equation editors.
Spreadsheet : Workbook, worksheets, data types, operators, cell formats, freeze panes, editing features, formatting features, creating formulas, using formulas, cell references, replication, sorting, filtering, functions, Charts & Graphs.
Presentation Graphics Software: Templates, views, formatting slide, slides with graphs, animation, using special features, presenting slide shows.

SECTION -D

Computer Network and Communication: Network types, network topologies, network communication devices, physical communication media.
Internet and its Applications: E-mail, TELNET, FTP, World Wide Web, Internet chatting; Intranet, Extranet, Gopher, Mosaic, WAIS.
Security management tools: PC tools, Norton Utilities, Virus, worms, threats, virus detection, prevention and cure utilities, Firewalls, Proxy servers.

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PROGRAMMING IN C
(BMCI104)

SECTION-A

Algorithm and Programming Development: Steps in development of a program, Flow charts, Algorithm Development, Program Debugging, Compilation and Execution.
Fundamentals of „C": I/O statements, Assignment Statements, Constants, Variables, Operators and Expressions, Standards and Formatted statements, Keywords, Data Types and Identifiers.

SECTION-B

Control Structures: Introduction, Decision making with if – statement, if-else and Nested if, while and do-while, for loop. Jump statements: break, continue, goto, switch Statement
Functions: Introduction to Functions, Function Declaration, Function Categories, Standard Functions, Parameters and Parameter Passing, Call – by value/reference, Recursion, Global and Local Variables, Storage classes.

SECTION-C

Arrays: Introduction to Arrays, Array Declaration, Single and Multidimensional Array, Memory Representation, Matrices, Strings, String handling functions.
Structure and Union: Declaration of structure, Accessing structure members, Structure Initialization, Arrays of structure, nested structures, Unions

SECTION-D

Pointers: Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays
Files: Introduction, Creating a data file, opening and closing a data file, processing a data file.
Preprocessor Directives: Introduction and Use, Macros, Conditional Preprocessors, Header Files

SOFTWARE LAB-I (Information Technology) (BMCI105)

This laboratory course will mainly comprise of exercise on what is learnt under the paper: (BMCI104)

1. Familiarizing with PC and WINDOWS commands,
2. File creation,
3. Editing
4. Directory creation.
5. Mastery of DOS internal & external commands.
6. Learning to use MS Office: MS WORD, MS EXCEL & MS PowerPoint.

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SOFTWARE LAB-II (Programming in C)

(BMCI-106)

This laboratory course will mainly comprise of exercise on what is learnt under the paper: (BMCI105)

1. Keywords and Identifiers: introduction, purpose
2. Variables and constants: data types, Initialization, declaration, scope, memory limits
3. Input-output statements: formatted and non-formatted statement s
4. Operators: Arithmetic, logical, conditional, assignment, bitwise, increment/decrement operators
5. Decision Making: switch, if-else, nested if, else-if ladder, break, continue, goto
6. Loops: while, do-while, for
7. Functions: definition, declaration, variable scope, parameterized functions, return statement, call by value, call by reference, recursive functions
8. Pre-processor Directives: Pre-processor directives like INCLUDE, IFDEF, DEFINE, etc
9. Header Files: STDIO.H, MATH.H, STRING.H, PROCESS.H etc
10. Arrays: Array declarations, Single and multi-dimensional, memory limits, strings and string functions
11. Pointers: Pointer declarations, pointer to function, pointer to array/string,
12. Files: Creation and editing of various types of files, closing a file(using functions and without functions)

SEMESTER SECOND

MATHEMATICS –II
(BMCI201)

SECTION-A
MATRIX ALGEBRA

Matrix algebra- Matrices, types of matrices, operations on matrices, determinants (without properties), minors, cofactors, adjoint and inverse of a matrix, Elementary transformations in a matrix Rank of a matrix, solution of simultaneous equations using Crammer"s rule and matrix inversion method.

SECTION-B
STATISTICS & APPLICATIONS OF LOGARITHMS

Statistics- Introduction to statistics, measures of central tendency - mean, median and mode, measures of dispersion, mean deviation, standard deviation and coefficient of variation.

Applications of Logarithms- Problems related to compound interest, depreciation and Annuities.

SECTION-C
DIFFERENTIAL CALCULUS

Introduction to differentiation, derivative of a function of one variable, power functions, sum and product of two functions, function of a function, differentiation by method of substitution, maxima and minima.

SECTION-D
INTEGRAL CALCULUS

Indefinite Integral, Integration by substitution, Integration by parts, Integration by partial fractions, Definite Integral. Numerical Integration: Trapezoidal rule, Simpson"s 1/3 rule, Simpson"s 3/8 rule.

ENVIRONMENTAL SCIENCE
(EVSC101)

SECTION-A

Introduction: Definition and scope and importance of multidisciplinary nature of environment. Need for public awareness.

Natural Resources: Natural Resources and associated problems, use and over exploitation, case studies of forest resources and water resources.

Ecosystems: Concept of Ecosystem, Structure, interrelationship, producers, consumers and decomposers, ecological pyramids-biodiversity and importance. Hot spots of biodiversity

Environmental Pollution: Definition, Causes, effects and control measures of air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measure of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster Management : Floods, earthquake, cyclone and landslides.

SECTION-B

Social Issues and the Environment From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Case studies. Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of pollution) Act. Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation Public awareness Human Population and the Environment, Population growth, variation among nations. Population explosion – Family Welfare Programme. Environment and human health, Human Rights, Value Education, HIV/AIDS. Women and child Welfare. Role of Information Technology in Environment and human health. Case studies

SYSTEM ANALYSIS & DESIGN
(BMCI202)

SECTION-A
System Development Life Cycle*:* System Definition, characteristics, elements & types of system, Phases of SDLC, Information gathering tools, Structured Analysis tools, Role of System Analyst.

SECTION-B
System Design: Process and stages of systems design, Input / Output and file design, Documentation (User Manual, Design Documentation, Training Manual), Case Study techniques in system design.

SECTION-C
System testing: Unit Testing, System Testing, Integration Testing, Alpha & Beta Testing, Acceptance Testing, Regression Testing.

SECTION-D
System Implementation: System implementation Process, Implementation methods, System maintenance, Post implementation maintenance.

OOPS USING C++
(BMCI203)

SECTION-A

Introduction: Object oriented programming approach, characteristics of object orientated languages, Bridging C & C++ (Overview of C Concepts).
Structures and Unions: Declaration of structures, Accessing structure members, Structure Initialization, Arrays of structure, nested structures, structure with pointers, functions & structures, Unions, Structure/Union Versus Class in C++.
Class Declaration: Data Members, Member Functions, Private and Public Members, Data Hiding and Encapsulation, Array within a class.

SECTION-B

Class Function Definition: Member Function definition inside the class and outside the class, Friend Function, Inline Function, Static Members & Functions, Scope Resolution Operator, Private and Public Member Functions, Nesting of Member Functions. Creating Objects, Accessing class data members, Accessing member functions, Arrays of Objects, Objects as function arguments: Pass by value, Pass by reference, Pointers to Objects.
Constructors and Destructors: Declaration and Definition, Default Constructors, Parameterized Constructors, Constructor Overloading, Copy Constructors. Destructors: Definition and use.

SECTION-C

Inheritance - Extending Classes Concept of inheritance, Base class, Derived class, Defining derived classes, Visibility modes : Private, public, protected; Single inheritance : Privately derived, Publicly derived; Making a protected member inheritable, Access Control to private and protected members by member functions of a derived class, Multilevel inheritance, Nesting of classes.
Function Overloading & Operator Overloading: Binary & Unary.

SECTION-D

Polymorphism: Definition, early Binding, Polymorphism with pointers, Virtual Functions, late binding, pure virtual functions.
Input/output files: Streams, buffers & iostreams, header files, redirection, file input and output.

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DATABASE MANAGEMENT SYSTEM (BMCI204)

SECTION A

An overview of DBMS: Concept of File Processing Systems and database systems, Database Administrator and his responsibilities. Physical and Logical data independence.

Three level Architecture of Database System: the external level, conceptual level and the internal level.

SECTION B

Introduction to Data Models: Entity Relationship Model, Hierarchical, Network and Relational Model. Comparison of Network, Hierarchical and Relational Model.

SECTION C

Relational data Model: Relational database, relational algebra and calculus, SQL dependencies, functional dependency, multi-valued dependency and join, normalization.

SECTION D

Database protection: Recovery, Concurrency Management, Database Security, Integrity and Control, Disaster Management

Distributed databases: Structure of a distributed database, design of distributed databases.

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SOFTWARE LAB-III (OOPS using C++)
(BMCI205)

This laboratory course will mainly comprise of exercise on what is learnt under the paper: (BMCI204)

SECTION – A
Structures: Definition, declaration, scope, functions
Union: Definition, declaration, scope, functions
Class: Definition, declaration, members, scope of members.

SECTION – B
Class Function: definition (Inside class, outside class), in-line functions, static function, friend functions, scope of functions (public, private), and nesting of member functions
Class Data members: creating objects, accessing member functions, array of objects, objects as arguments (Pass by value, pass by reference)
Constructor and destructor: creating default constructor, parameterized constructor, copy constructor, destructor

SECTION – C
Inheritance: base class, derived class, visibility mode (public, private, protected), single inheritance, multi-level inheritance, multiple inheritance, nesting of classes, access control to functions(with different scope),
Function overloading and overriding, operator overloading,

SECTION – D
Early binding, late binding, virtual functions, pure virtual functions
Input/output files: streams, buffers and io-streams, various input-output functions, processing files using class functions

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SOFTWARE LAB-IV (Database Management Systems) (BMCI206)

This laboratory course will mainly comprise of exercise on what is learnt under the paper: (BMCI205)

Familiarization with MS Access: Features, Elements, Parts of MS Access Window, Creating and Saving Database, and Tables.
Using Queries: Running various DDL and DML commands using SQL, Creating Views
Open Source Databases Software's-SQL Cipher, MYSQL,SQLite
Introductory Practicals on using Crystal Report

THIRD SEMESTER

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RELATIONAL DATABASE MANAGEMENT SYSTEM

BMCI301

Review of DBMS:

Section – A

Basic DBMS terminology; Architecture of a DBMS: Data Independence - Physical and Logical Independence, Degree of Data Abstraction, Initial Study of the Database, Database Design, Implementation and Loading, Testing and Evaluation, Operation, Maintenance and Evaluation.

Conceptual Model:

Entity Relationship Model, Importance of ERD, Symbols (Entity: Types of Entities, week Entity, Composite Entity, Strong Entity, Attribute: Types of Attribute, Relationship: Type of relationship, Connectivity, Cardinality).

Section – B

Database Models and Normalization:

Comparison of Network, Hierarchical and Relational Models, Object Oriented Database, Object Relational Database, Comparison of OOD & ORD; Normalization and its various forms, De-Normalization, Functional Dependencies, Multi-valued Dependencies, Database Integrity: Domain, Entity, Referential Integrity Constraints.

Transaction Management and Concurrency Control:

Client/ Server Architecture and implementation issues, Transaction: Properties, Transaction Management with SQL, Concurrency; Concurrency Control: Locking Methods: (Lock Granularity, Lock Types, Two Phase Locking, Deadlocks), Time Stamping Method, Optimistic Method, Database Recovery Management.

Section – C

Distributed Databases:
Centralized Verses Decentralized Design; Distributed Database Management Systems (DDBMS): Advantage and Disadvantages; Characteristics, Distributed Database Structure, Components, Distributed Database Design, Homogeneous and Heterogeneous DBMS.

Levels of Data and Process Distribution:
SPSD (Single–Site Processing, Single-Site Data), MPSD (Multiple-Site Processing, Single Site Data), MPMD (Multiple –Site Processing, Multiple-Site Data), Distributed Database Transaction Features, Transaction Transparency, Client/ Server Vs DDBMS.

Section – D

Business Intelligence and Decision Support System:
The need for Data Analysis, Business Intelligence, Operational Data vs. Decision Support Data, DSS Database properties and importance, DSS Database Requirements.

OLAP and Database Administration:
Introduction to Online Analytical Processing (OLAP), OLAP Architecture Relational, Star Schemas, Database Security, Database administration tools, Developing a Data Administration Strategy.

DATA STRUCTURES

BSBC302

SECTION-A

Introduction to Data Structures: Basic concept of data, Problem analysis, algorithm complexity, Big O notation and time space trade off, Types of data structures: arrays records, pointers, stack, queue, trees, linked list packet, blocks, tracks, sector(in storage devices).
Searching and Sorting: Use of various data structures for searching and sorting, linear and binary search, bubble sort, insertion sort, selection sort.

SECTION-B

Stacks & Queues: Basics of stacks and queues, Recursion, Polish notation, circular Queues, priority Queues.

SECTION-C

Linked Lists: Single linked list, Circular linked list, Doubly linked list and Dynamic storage management, generalized list, Garbage Collection.

SECTION-D

Trees: Definition & Concepts, Basic trees, Binary tree representations, Binary tree traversals and application of trees.

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COMPUTER GRAPHICS

BSBC 602

SECTION-A

Introduction to Active and Passive Graphics, Applications of Computer Graphics.

Input devices: light pens, Graphic tablets, Joysticks, Trackball, Data Glove, Digitizers, Image scanner,
Graphs and Types of Graphs.

Video Display Devices-- Refresh Cathode Ray Tube, Raster Scan displays, Random Scan displays, Architecture of Raster and Random Scan Monitors, Color CRT-monitors and Color generating techniques
(Shadow Mask, Beam Penetration) , Direct View Storage Tube, Flat-Panel Displays; 3-D Viewing Devices, Raster Scan Systems, Random Scan Systems, Graphics monitors and workstations, Color Models
(RGB and CMY), Lookup Table.

SECTION-B

Process and need of Scan Conversion, Scan conversion algorithms for Line, Circle and Ellipse, effect of
scan conversion, Bresenham's algorithms for line and circle along with their derivations, Midpoint Circle
Algorithm, Area filling techniques, flood fill techniques, character generation.

SECTION-C

2-Dimensional Graphics: Cartesian and need of Homogeneous co-ordinate system, Geometric transformations (Translation, Scaling, Rotation, Reflection, Shearing), Two-dimensional viewing transformation and clipping (line, polygon and text), Cohen Sutherland, Sutherland Hodgeman and Liang
Barsky algorithm for clipping.

SECTION-D

Introduction to 3-dimensional Graphics: Geometric Transformations (Translation, Scaling, Rotation,
Reflection, Shearing), Mathematics of Projections (parallel & perspective). Introduction to 3-D viewing
transformations and clipping.

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FUNDAMENTALS OF INTERNET TECHNOLOGY

BMCI302

SECTION-A

Introduction to Web Development:
Website, Webpage, Static Website, Dynamic Website, web, web 2.0 ,WWW, Web Server, Browser basics

Introduction to HTML/DHTML:
HTML Basics, HTML Elements (Tags), Structure of HTML Program, Attributes, Headings, Paragraphs, Formatting, Links, Images, Tables, Lists, Forms, Frames, Tables creation & Storage, Lists, Images, Forms, CSS in DHTML, Implementation of WebPages using CSS.

SECTION-B

Introduction to XML:
XML Basics, XML Syntax and Editors, Elements, Attributes, Document Type Definitions (DTD), XML Schemas (XSD), XML Namespaces, XML Document Object Model, XSLT, Use of XSLT with XML.

Introduction to Ajax:
Ajax Basics, Use of Ajax in Website, Ajax browser support, Ajax technology, Ajax Security, Issues with Ajax.

SECTION-C

Introduction to JavaScript:
How & Where to put the JavaScript Code, JavaScript Statements, Comments, Variables, Operators, Control Statements, Loops, Popup Boxes, Functions.

The JavaScript Document Object Model :
Introduction (Instance, Hierarchy); The JavaScript Assisted Style Sheets DOM (JSSS DOM); Understanding Objects in HTML (Properties of HTML objects, Methods of HTML objects); Browser Objects (The Web Page HTML Object Hierarchy, Access to Elements of a Web Page, How a Web Page Element is Manipulated); Handling (WEB PAGE) Events Using JavaScript (Named JavaScript Event handlers).Forms Used by a Web Site

SECTION-D

Purchasing a Domain Name & Web Space:
Domain Name & Web Space, Getting a Domain Name & Web Space (Purchase or Free), Uploading the Website to Remote Server.

Cookies : What are Cookies; Setting a Cookie.

COMPUTER NETWORKS

BSBC603

SECTION- A

Data communications concepts: Digital and analog transmissions-Modem, parallel and serial, synchronous and asynchronous, Modes of communication: Simplex, half duplex, full duplex, Concept of
multiplexing, De-multiplexing.

Types of Networks: LAN, MAN, WAN

Network Topologies: Bus, Star, Ring, Mesh, Tree, Hybrid

Communication Channels: Wired transmissions: Telephone lines, leased lines, switch line, coaxial
cables-base band, broadband, optical fiber transmission.

SECTION- B

Wireless Transmission: (Standards and Specification) Microwave transmission, Infrared transmission,
Laser transmission, Radio transmission and Satellite transmission and Blue Tooth, Frequency Spectrum.

Communication Switching Techniques: Circuit Switching, Message Switching, Packet Switching.

Network Reference Models: OSI Reference Model, TCP/IP Reference Model, Comparison of OSI andnTCP/IP Reference Models.

SECTION- C

Data Link Layer Design Issues: Services provided to the Network Layer, Framing, Error Control (error
detection and correction code), Flow Control, Data Link Layer in the Internet (SLIP, PPP).

Types of Multiplexing: FDM, TDM, CDMA

SECTION- D

MAC sub layer: CSMA/CD/CA, IEEE standards (IEEE802.3 Ethernet, Gigabit Ethernet, IEEE 802.4
Token Bus, IEEE 802.5 Token Ring)

The Network Layer: Design Issues, Routing Algorithms: Optimality Principle, Shortest Path Routing,
Congestion Control Policies, Concept of Internetworking.

SOFTWARE LAB-V(Computer Graphics)
BSBC 605

Implement the Following Algorithms using C/C++:-

Use of basic functions of graphic available in C++ like circle, putpixel, rectangle, arc, ellipse, floodfill,
setcolor etc.
Use of basic primitive functions to show some animations.
Line Drawing Algorithm like Direct method, DDA and Bresenham's line algorithms.
Draw a circle using polynomial, trigonometry method and Bresenham's Algorithm.
Draw an ellipse using Bresenham's Algorithm.
To move a character along circle.
To show 2D Clipping and Window

SOFTWARE LAB-VI (Internet Technology)
BMCI 303

Internal Assessment-60 Marks **External Assessment-40 Marks**

Implementation of all the practical Concepts related to theory concepts studied in FUNDAMENTALS OF INTERNET TECHNOLOGY [BSBC 304].

1. HTML Basics, HTML Elements (Tags), Structure of HTML Program
2. CSS in DHTML, Implementation of WebPages using CSS.
3. XML Basics, XML Syntax and Editors, Document Object Model, Use of XSLT with XML.
4. Ajax Basics, Ajax technology
5. Javascript Programs
6. Domain Name Server

Semester Fourth

ADVANCE WEB DEVELOPMENT

BMCI-401

SECTION-A

Introduction to ASP.NET:
.NET Framework (CLR, CLI, BCL), ASP.NET Basics, ASP.NET Page Structure, Page Life Cycle.
Controls:
HTML Server Controls, Web Server Controls, Web User Controls, Validation Controls, Custom Web Controls.

SECTION-B

State Management:
View State, Control State, Hidden Fields, Cookies, Query Strings, Application State, Session State, Profile Properties, Master Pages, Themes, Site Navigation.
Introduction to ADO.NET, Data Binding, Importing the SqlClient Namespace, Defining the Database Connection, Managing Content Using Grid View and Details View.

SECTION-C

Security and User Authentication:
Basic Security Guidelines, Securing ASP.NET Applications, ASP.NET Memberships and Roles.
Working with Files and Email:
Writing and Reading Text Files, Uploading Files, Sending Email with ASP.NET, Introduction to Web Services, Ajax, Silverlight.

SECTION-D

Introduction to Dreamweaver:
Understanding Workspace Layout, Managing Websites, Creating a Website,
Using Dreamweaver Templates, Adding New WebPages, Text and Page Format,
Inserting Tables, Lists, Images, Adding Links.
Purchasing a Domain Name & Web Space:
Domain Name & Web Space, Getting a Domain Name & Web Space (Purchase or Free), Uploading the Website to Remote Server.

Punjab Technical University

Bachelor in Mobile Computing & Internet Batch 2014 onwards

PROGRAMMING IN JAVA

BSBC502

SECTION-A

FUNDAMENTALS OF OBJECT–ORIENTED PROGRAMMING: - Introduction; Object-Oriented Paradigm; Basic Concepts of Object-Oriented Programming Benefits of OOP; Applications of OOP.

JAVA EVOLUTION: - Java History; Java Features; How Java Differs from C and C++; Java and Internet, Java and World Wide Web, Web Browsers; Hardware and Software Requirements; Java Support Systems, Java Environment

OVERVIEW OF JAVA LANGUAGE: - Introduction; Simple Java Program; Comments in java; An application with Two Classes; Java Program Structure; Java Tokens; Java Statements; Implementing a Java Program; Java Virtual Machine; Command Line Arguments; Programming Style.

CONSTANTS, VARIABLES AND DATA TYPES: - Introduction; Constants; Variables; Data Types; Variables, Constants, Standard Default Values.

OPERATORS AND EXPRESSIONS: - Introduction to Operators, Expressions; Operator Precedence; Mathematical Functions.

DECISION MAKING, BRANCHING AND LOOPING: - Decision making and Branching Statements, Looping Statements, Labeled loops, Jumping Statements

SECTION-B

CLASSES, OBJECTS AND METHODS: - Introduction; Defining a Class; Adding Variables; Adding Variables; Adding Methods; Creating Objects; Accessing Class Members; Constructors; Methods Overloading; Static Members; Nesting of Methods; Inheritance: Extending a Class; Overriding Methods; Final Variables and Methods; Final Classes; Finalizer Methods; Abstract Methods and Classes; Visibility Control.

ARRAYS, STRINGS AND VECTORS: - Arrays; Zagged Arrays:; Strings; String functions: Vectors; Wrapper Classes.

INTERFACES: Introduction; Defining Interfaces; Extending Interfaces; Implementing Interfaces; Accessing Interface Variables, Implementing Multiple Inheritence using Interfaces.

PACKAGES: Introduction; System Packages; Using System Packages; Naming Conventions; Creating Packages; Accessing a Package; Using a Package; Adding a Class to a Package; Hiding Classes.

SECTION-C

MANAGING ERRORS AND EXCEPTIONS: - Introduction; Types of Errors; Exceptions; Exception Handling using Try, Catch and Finally block: Throwing Our Own Exceptions; Using Exceptions for Debugging.

APPLET PROGRAMMING: - Introduction; How Applets Differ from Applications; Applet Life Cycle; Creating an Executable Applet; Passing Parameters to Applets; Aligning the Display; More about HTML Tags; Displaying Numerical Values; Getting Input from the User.

GRAPHICS PROGRAMMING: - Introduction; The Graphics Class; Lines and Rectangles; Circles and Ellipses; Drawing Arcs; Drawing Polygons; Line Graphs; Using Control Loops in Applets; Drawing Bar

Charts.

SECTION–D

JAVA AWT: - Java AWT package Containers; Basic User Interface components; Layouts.

EVENT HANDLING: - Event delegation Approach; ActionListener; AdjustmentListener, MouseListener; MouseMotionListener; WindowListener; KeyListener; ItemListener

JAVA I/O HANDLING : I/O File Handling(Input Stream & Output Streams, File Input Stream & FileOutputStream, Data I/P and O/P Streams, File Class, Reader and Writer Streams, Random Access File).

Punjab Technical University
Bachelor in Mobile Computing & Internet Batch 2014 onwards

MOBILE COMMERCE

BMCI402

SECTION–A

Introduction to Electronic Commerce, Potential benefits & limitations of E-Commerce, Traditional Commerce vs. E-Commerce vs M-Commerce, Different E-Commerce Models (B2B, B2C, C2C, P2P), E-Commerce applications, Social Networks, Auctions & Portals, Legal and Ethical issues in E-Commerce.

SECTION–B

Introduction to Electronic Data Interchange, Types of EDI, Benefits of EDI
Overview of Electronic Payment system, Types of Electronic payment schemes (Credit cards, Debit cards, Smart cards, Internet banking), Issues in Electronic payment systems
Web Based Marketing and Communications: Online Advertising, E-Mail Marketing, Online Catalogs, Social Marketing and Targeted Marketing, Techniques and Strategies

SECTION-C

Mobile commerce Introduction – Infrastructure of M–Commerce – Types Of Mobile Commerce Services – Technologies Of Wireless Business – Benefits And Limitations, Support, Mobile Marketing & Advertisement, Non– Internet Applications In M–Commerce – Wireless/Wired Commerce Comparisons.

Mobile commerce: Technology

A Framework For The Study Of Mobile Commerce – NTT Docomo's I-Mode – Wireless Devices For Mobile Commerce – Towards A Classification Framework For Mobile Location Based Services – Wireless Personal And Local Area Networks –The Impact Of Technology Advances On Strategy Formulation In Mobile Communications Networks.

SECTION-D

Mobile commerce: theory and applications

The Ecology Of Mobile Commerce – The Wireless Application Protocol – Mobile Business Services – Mobile Portal – Factors Influencing The Adoption of Mobile Gaming Services – Mobile Data Technologies And Small Business Adoption And Diffusion – E–commerce in The Automotive Industry – Location– Based Services: Criteria For Adoption And Solution Deployment – The Role of Mobile Advertising In Building A Brand – M–commerce Business Models

Business– to– business Mobile Commerce
Enterprise Enablement - Email and Messaging - Field Force Automation (Insurance, Real Estate, Maintenance, Healthcare) – Field Sales Support (Content Access, Inventory) – Asset Tracking and Maintenance/Management – Remote IT Support – Customer Retention (B2C Services, Financial, Special Deals) – Warehouse Automation – Security.

Linux Operating System

BMCI403

SECTION-A

INTRODUCTION TO LINUX OPERATING SYSTEM:
Introduction and Types of Operating Systems, Linux Operating System, Features, Architecture Of Linux OS and Shell Interface, Linux System Calls, Linux Shared Memory Management, Device and Disk Management in Linux, Swap space and its management. File System and Directory Structure in Linux. Multi-Processing, load sharing and Multi-Threading in Linux, Types of Users in Linux, Capabilities of Super Users and equivalents.

INSTALLING LINUX AS A SERVER : Linux and Linux Distributions ;Major differences between various Operating Systems (on the basis of: Single Users vs Multiusers vs Network Users; Separation of the GUI and the Kernel; Domains; Active Directory;).

INSTALLING LINUX IN A SERVER CONFIGUARTION : Before Installation; Hardware; Server Design ;Dual-Booting Issues; Modes of Installation; Installing Fedora Linux; Creating a Boot Disk; Starting the Installation; GNOME AND KDE : The History of X Windows; The Downside; Enter GNOME; About GNOME ;Starting X Windows and GNOME; GNOME Basics; The GNOME Configuration Tool.

SECTION -B

INSTALLING SOFTWARE : The Fedora Package Manager; Installing a New Package using dpkg and RPM; Querying a Package; Uninstalling a Package using dpkg and RPM; Compiling Software; Getting and Unpacking the Package; Looking for Documentation; Configuring the Package; Compiling Your Package; Installing the Package, Driver Support for various devices in linux.

MANAGING USERS: Home Directories ;Passwords; Shells; Stratup Scripts; Mail; User Databases; The / etc /passwd File; The / etc / shadow File; The / etc /group File; User Management Tools; Command-Line User Management; User LinuxConf to Manipulate Users and Groups; SetUID and SetGID Programs

SECTION -C

THE COMMAND LINE : An Introduction to BASH, KORN, C, A Shell etc. ; BASH commands: Job Control; Environment Variables; Pipes; Redirection; Command-Line Shortcuts; Documentation Tools; The man Command; the text info System; File Listings; Owner ships and permissions; Listing Files; File and Directory Types; Change Ownership; Change Group; Change Mode ;

SECTION -D

BOOTING AND SHUTTING DOWN: LILO and GRUB; Configuring LILO; Additional LILO options; Adding a New Kernel to Boot ; Running LILO; The Steps of Booting; Enabling and disabling Services

FILE SYSTEMS: The Makeup File Systems; Managing File Systems; Adding and Partitioning a Disk; Network File Systems; Quota Management; Init services

PRINTING : The Basic of lpd; Installing LPRng; Configuring /etc/printcap; The /ETC/lpd.perms File; Clients of lpd, Interfacing Printer through Operating System.

Punjab Technical University
Bachelor in Mobile Computing & Internet Batch 2014 onwards

Software Engineering

BMCI404

SECTION A

Software: Characteristics, Components Applications, **Software Process Models:** Waterfall, Spiral, Prototyping, Fourth Generation Techniques, Concepts of Project Management, Role Of Metrics And Measurement.

SECTION B

S/W Project Planning: Objectives, **Decomposition Techniques:** S/W Sizing, Problem Based Estimation, Process Based Estimation, **Cost Estimation Models:** COCOMO Model, The S/W Equation, **System Analysis:** Principles Of Structured Analysis, Requirement Analysis, DFD, Entity Relationship Diagram, Data Dictionary.
S/W Design: Objectives, Principles, Concepts,
Design Methodologies: Data Design, Architecture Design, Procedural Design, Object – Oriented Concepts.

SECTION C

Testing Fundamentals: Objectives, Principles, Testability, **Test Case Design:** White Box & Black Box testing
Testing Strategies: Verification & Validation, Unit Testing, Integration Testing, Validation Testing, System Testing.

SECTION D

Advanced topics in Software Engineering: Reengineering: Reverse Engineering, Restructuring, Forward Engineering.
Computer Aided Software Engineering (CASE): Taxonomy of CASE tools.

Software Lab – VII (ADVANCE WEB DEVELOPMENT)

BMCI 405

Implementation of all the programs related to theory concepts studied in Web Technologies [BSBC 401]

- HTML Basics, HTML Elements (Tags)
- NET Framework (CLR, CLI, BCL), ASP.NET Basics
- Understanding Workspace Layout, Managing Websites, Creating a Website
- Using Dreamweaver Templates
- ADO.NET, Data Binding, Importing the SqlClient Namespace
- Database Connection

Software Lab – VIII (Programming In Java)

BSBC505

Internal Assessment-60 Marks **External Assessment-40 Marks**

Implementation of all the programs related to theory concepts studied in Programming in Java Paper [BSBC 502].

1. Operators and Mathematical Functions.
2. Decision making, Branching and Looping Statements.
3. Classes, Objects and Methods.
4. Arrays, Strings and Vectors.
5. Interfaces.
6. Packages.
7. Exception handling.
8. Applet Programming.
9. AWT.
10. Event Handling.
11. I/O Handling.

Semester Fifth

Punjab Technical University

Bachelor in Mobile Computing & Internet Batch 2014 onwards

MOBILE APPLICATION DEVELOPMENT

BMCI 501

SECTION-A

Introduction: Overview of Java, Basics of Android & its applications, Smartphone's future, Comparison of Android with other environments.

Android Architecture: Android Stack, Android applications structure.

UI Architecture: Application context, Intents, Activity life cycle, supporting multiple screen sizes.

SECTION-B

User Interface Widgets: Text controls, Button controls, Toggle buttons, Images.

Notification and Toast: Parameters on Intents, Pending intents, Status bar notifications, Toast notifications.

Menus & Dialogs: Localization, Options menu, Context menu; Alert dialog, Custom dialog, Dialog as Activity.

Lists: Using string arrays, Creating lists, Custom lists.

Location and Maps: Google maps, Using GPS to find current location.

Working with data storage: Shared preferences, Preferences activity, Files access, SQLite database.

Animation: View animation, Draw able animation.

SECTION-C

Network Communication: Web Services, HTTP Client, XML and JSON.

Services: Service lifecycle, Foreground service.

Publishing Your App : Preparing for publishing, Signing and preparing the graphics, publishing to the Android Market.

SECTION-D

Introducing SQLite: SQLiteOpenHelper and creating a database, Opening and closing a database

Cursors and its types, Working with cursors Inserts, updates, and deletes.

DATABASE CONNECTIVITY : SQLite Data Types, Content Values, Adding, Updating and Deleting Content , Content provider: introduction, Query providers.

Punjab Technical University

Bachelor in Mobile Computing & Internet Batch 2014 onwards

Programming IN PHP

BMCI-502

SECTION-A

Introduction to PHP : Evolution of PHP & its comparison, Interfaces to External systems, Hardware and Software requirements, PHP Scripting, Web Designing Basics and WYSIWYG Editor, Receiving User Input, Repeating Code.

Basic PHP Development : Working of PHP scripts, Basic PHP syntax, PHP data types, Google Caffeine, displaying type information, Testing for a specific data type, Changing type with Set type, Operators, Variable manipulation, Dynamic variables, Variable scope, Accessing variable with the global statement Static vs. Dynamic Optimization, Analytics, Analysis and ROI Concept.

Control Structures: If() and elseif() condition Statement, The switch statement, Using the ? Operator, Using the while() Loop, The do while statement, Using the for() Loop, Breaking out of loops, Nesting loops.

SECTION-B

Function : Function definition, Creation, Returning values, User-defined functions, Dynamic function, Function calls with the static statement, default arguments, Passing arguments to a function by value.

String Manipulation: Formatting String for Presentation, Formatting String for Storage, Joining and Splitting String, Comparing String, Matching and replace Substring.

Array : Anatomy of an Array , Creating index based and Associative array , Accessing array Elements , Looping with Index based array , Looping with associative array using each() and foreach(), Library function.

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SECTION-C

Forms : Working with Forms, Super global variables, Super global array, Importing user input, Accessing user input, Combine HTML and PHP code, Using hidden fields, Redirecting the user.

Working with File and Directories: Understanding file & directory, Opening and closing a file , Coping, renaming and deleting a file , Working with directories , Building a text editor , File Uploading & Downloading.

Generating Images with PHP: Basics computer Graphics, Creating Image , Manipulating Image , Using text in Image.

Database Connectivity with MySql : Introduction to RDBMS , Connection with MySql Database, Performing basic database operation(DML) (Insert, Delete, Update, Select), Setting query parameter , Executing query , Join (Cross joins, Inner joins, Outer Joins, Self joins).

Cookies: Introduction of Cookies, Setting time in a cookie with PHP, Deleting a cookie, Creating session cookie, Working with the query string.

Session : Starting a session, Registering Session variables, working with session variables, destroying session, passing session Ids, encoding and decoding session variables, increase session expire time, working of session without cookie.

SECTION-D

Advance PHP techniques: Introduction about FTP/SMTP server, Math functions, File upload, File Download, E-mail with PHP, PHP configuration file, Error tackling and debugging

PHP Project: Various Application of PHP Project, Requirements analysis of Project.

Punjab Technical University

Bachelor in Mobile Computing & Internet Batch 2014 onwards

SOFTWARE TESTING AND QUALITY ASSURANCE

BMCI-503

SECTION-A

Testing Principles : Need of testing, Basic concepts – errors, faults, defects, failures, test bed, unit testing, integration testing system, system testing, regression testing, alpha, beta and acceptance testing , functional testing, performance testing, recovery testing, white box testing, black box testing, verification and validation.

Test Management : Testing Life Cycle – Roles and activities, Test Planning – forming a test team, develop test plan review ,Test Cases design strategies black box approach: random testing, equivalence class partitioning and boundary value analysis. white box approach: test adequacy criteria, coverage and control flow graphs, paths, loop testing, mutation testing. Test execution: build test data, life cycle of defect, defect tracking, defect detection stages, defect detection stages, defect types, defect severity, defect analysis and prevention.

SECTION-B

Software Metrics : Scope of software metrics, Classifying software measures, Measurement basics – representational theory, scales, meaningfulness, What to measure – GOM technique, Control flow structure, product quality metrics – MTTF, defect density, customer problems, customer satisfaction, function point, Metrics for software maintenance, In-process quality metrics.

Quality Assurance : Quality concepts – quality, quality control, quality assurance, cost of quality Software quality assurance – SQA activities, software reviews, inspections, audits, Software reviews, inspections, audits, Software reliability Quality Attributes: correctness, reliability, usability, integrity, portability, maintainability, interoperability. Ishikawa's Seven Basic Tools.

SECTION-C

Comparative evaluation of techniques: Testing tools, Dynamic analysis tools, test data generators, Debuggers, test drivers etc.

Technical Metrics for Software: Quality factors, framework, Metrics for analysis, design, testing source code etc.

Object Oriented Testing: OOT strategies and issues: Test case design, interface testing.

SECTION-D

Quality Management : Quality Standards, Basic concept of – ISO 9000 & 9001, CMM, Six Sigma.

CMM : Development of CMM, CMM – Following KPAs : requirements management (RM), software project tracking and oversight (SPTO), software configuration management (SCM), organization process definition (OPD), software product engineering (SPE), peer reviews (PR), quantitative process management (QPM), defect prevention (DP), process change management

DATA WAREHOUSING & MINING

BMCI 504

SECTION-A

Data Warehousing : Introduction, need for data warehousing, Operational & Informational Data Stores, Data Ware house Characteristics, Data Warehouse role & Structure, The cost of warehousing data.

OLAP & OLTP: Introduction to OLAP & OLTP, Difference between OLAP & OLTP, OLAP Operations.

SECTION-B

Data Warehousing: Building a Data Warehouse, Design/Technical/Implementation Considerations, Data Preprocessing Overview. Data Summarization, Data Cleaning, Data Transformation, Concept Hierarchy, Structure. Patterns & Models, Artificial Intelligence (Overview). Multidimensional Data Model, Schemas for Multidimensional Data (Star Schema, Snowflake Schema, Fact Constellation), Data Warehouse Architecture, Data Warehouse Design, OLAP Three-tier Architecture, Indexing & Querying in OLAP, OLAM, Efficient Methods of Cube Computation, Discovery Driven Exploration of Data Cubes, Attributed-Oriented Induction.

SECTION -C

Data Mining: Association Rule Mining, Market Basket Analysis, Apriori Algorithm, Mining Multilevel Association Rules, From Association Mining to Correlation Analysis, Constraint Based Association Mining, Introduction to Classification, Classification by decision Tree, Attribute Selection Measure.

SECTION -D

Prediction: Introduction to Prediction techniques, Accuracy of a Classifier, Cross-Validation, Bootstrap, Boosting, Bagging, Introduction to Clustering, Classification of Various Clustering Algorithms, Selecting and Using Right DM Technique, Selecting and Using Right DM Technique, Data Visualization.

Information Security

BMCI 505

Section A

Information Security Concepts : Information Security Overview, Background and Current Scenario, Principles of Security- Information Classification, Policy Framework, Role based Security in an organization, Components of Information Systems, Balancing Information Security and Access, Approaches to information Security Implementation, Security Systems Development Life Cycle.

Section B

Security Threats and Vulnerabilities: Overview of Threats and Vulnerabilities-Intruders, Malicious Software, Viruses and related Threats, Desktop Security, Email security: PGP and S/MIME, Web Security: Web authentication, SSL and SET, Database Security. Firewalls-Overview, Design principles and Types.

Section C

Security Management and Laws: Introduction to Security Management, Access Control and Intrusion Detection, Overview of Identification and Authorization, Intrusion Detection Systems and Intrusion Prevention Systems, Security Procedures and Guidelines, Business Ethics and Best Practices, Security Assurance, Security Laws, IPR , International Security Standards, Security Audit, **SSE-CMM / COBIT etc.**

Section D

Cryptography : Concepts and Techniques, Symmetric and Asymmetric Key Cryptography, Steganography , Symmetric Key Ciphers- DES, AES (Structure and Analysis). Asymmetric Key Ciphers- Principles of Public Key cryptosystems, RSA Algorithm and its Analysis. Digital Signatures.

Software Lab – VIII (Mobile Application Development)

BMCI- 506

Implementation of all the programs related to theory concepts studied in Mobile Application Development [BMCI - 501].

Practical will be based on the syllabus of theory paper of Practical lab

Android Programming, Installing the SDK, Creating Android Emulator , Installing Eclipse

Installing Android Development Tools, Supporting multiple screen sizes, Alert dialog, Custom dialog, Dialog as Activity, Using string arrays , Creating lists , Custom lists.

Database SQLite Programming

- ✓ SQLiteOpenHelper
- ✓ SQL API, spinner, List view
- ✓ SQLiteDatabse
- ✓ Cursor
- ✓ Reading and updating Contacts
- ✓ Reading bookmarks
- ✓ Example: Develop an App to demonstrate database usage. CRUD operations must be implemented. Final details should be viewed in GridView as well as in ListView.

Software Lab – IX (Programming In PHP)

BMCI - 507

Implementation of all the programs related to theory concepts studied in Programming In PHP [BMCI - 502].

Practical will be based on the syllabus of theory paper of Practical lab. Students need to work on project of PHP.

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Sixth Semester

MOBILE CLOUD COMPUTING

BMCI- 601

SECTION-A

CLOUD COMPUTING : Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Pros and Cons of Cloud Computing, Benefits of Cloud Computing, Cloud computing vs. Cluster computing vs. Grid computing, Role of Open Standards

CLOUD COMPUTING ARCHITECTURE : Cloud computing stack, Comparison with traditional computing architecture (client/server), Services provided at various levels, working of Cloud Computing, Role of Networks in Cloud computing, protocols used, Role of Web services. Service Models (XaaS) - Infrastructure as a Service(IaaS), Platform as a Service(PaaS), Software as a Service(SaaS), Deployment Models - Public cloud, Private cloud, Hybrid cloud, Community cloud.

SECTION-B

CLOUD SECURITY

Security Concepts: Confidentiality, privacy, integrity, authentication, non-repudiation, availability, access control, defence in depth, least privilege, importance of security in the cloud, Importance in PaaS, IaaS and SaaS; Cryptographic Systems: Symmetric cryptography, stream ciphers, block ciphers, modes of operation, public-key cryptography, hashing, digital signatures, public-key infrastructures, key management, X.509 certificates, OpenSSL.

Cloud Security :- Infrastructure Security, Network level security, Host level security, Application level security, Data security and Storage, Data privacy and security Issues, Jurisdictional issues raised by Data location, Identity & Access Management Access Control, Risk Involved, Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business considerations.

SECTION-C

MOBILE CLOUD

Introduction: Mobile Clouds , Sharing Device Resources in Mobile Clouds; Enabling Technologies For Mobile Clouds: Wireless Communication Technologies, Network Coding for Mobile Clouds, Mobile Cloud Formation and Maintenance; Social Aspects Of Mobile Clouds: Social Mobile Clouds; Green Aspects Of Mobile Clouds: Green Mobile Clouds: Making Mobile Devices More Energy Efficient; Application Of Mobile Clouds: Mobile Clouds Applications; Some Insights on the Future Developments of Mobile Clouds.

MOBILE CLOUD COMPUTING

Introduction to Mobile Cloud Computing, Comparison of Mobile Cloud Computing with Cloud Computing, Architecture of Mobile Cloud Computing,
Pros and Cons of Mobile Cloud, Benefits of Mobile Cloud Computing Over Cloud Computing.

SECTION-D

SERVICE MANAGEMENT IN MOBILE CLOUD COMPUTING

Service Level Agreements(SLAs), Billing & Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of scaling: Benefitting enormously, Managing Data - Looking at Data, Scalability & Cloud Services , Database & Data Stores in Cloud , Large Scale Data Processing.

PROJECT MANAGEMENT
BMCI- 602

SECTION-A

Project Management Fundamentals- Basic Definitions, Project Stakeholders and Organizational, Influences on Project Management, Project Management Processes, Project Initiating Processes

SECTION-B

Planning and Resourcing a Project - Identifying Requirements, Creating the Work Breakdown structure, Developing the Project Schedule, Developing a Project Cost Estimate, Planning Quality, Organizing the Project Team, Planning for Potential Risks

SECTION-C

Executing and Managing a Project - Project Executing Processes- Acquiring and Developing the Project Team, Managing the Project Team, Managing Stakeholder Expectations, Directing and Managing the Project while assuring Quality

SECTION-D

Project Monitoring and Controlling Processes - Verifying and Controlling Scope, Managing Schedule and Cost, Controlling Quality, Monitoring and Controlling Risks

Text Books:

1. Software Engineering - Somerville (Addison Wesley) .

2. Software Engineering-Pressmen.

MOBILE ADHOC NETWORKS

BMCI- 603

SECTION-A

Introduction : Fundamentals of Wireless Communication Technology ,The Electromagnetic Spectrum ,Radio Propagation Mechanisms , Characteristics of the Wireless Channel , IEEE 802.11a–b Standard , Origin of Ad hoc Packet Radio Networks , Technical Challenges , Architecture of PRNETs , Components of Packet Radios ,

Mobile Adhoc Network :- Introduction to adhoc networks – definition, characteristics features, applications. Characteristics of Wireless channel, Adhoc Mobility Models:- Indoor and outdoor models. Ad hoc Wireless Networks , Heterogeneity in Mobile Devices, Wireless Sensor Networks, Types of Ad hoc Mobile Communications ,Types of Mobile Host Movements , Challenges Facing Ad hoc Mobile Networks , Ad hoc wireless Internet.

SECTION-B

MEDIUM ACCESS PROTOCOLS

MAC Protocols: design issues, goals and classification. Contention based protocols-with reservation, scheduling algorithms, protocols using directional antennas. IEEE standards: 802.11a, 802.11b, 802.11g, 802.15

AD HOC ROUTING PROTOCOLS

Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Classifications of Routing Protocols , Driven Routing Protocols , Destination Sequenced Distance Vector (DSDV) , Wireless Routing Protocol (WRP), Ad hoc On–Demand Distance Vector Routing (AODV) , Dynamic Source Routing (DSR) , Temporally Ordered Routing Algorithm (TORA

SECTION-C

NETWORK PROTOCOLS

Routing Protocols: Design issues, goals and classification. Proactive Vs reactive routing, Unicast routing algorithms, Multicast routing algorithms, hybrid routing

algorithm, Energy aware routing algorithm, Hierarchical Routing, QoS aware routing.

TRANSPORT LAYER– SECURITY PROTOCOLS

Issues in Designing a Transport Layer Protocol for Ad hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad hoc Wireless Networks , Classification of Transport Layer Solutions , TCP over Ad hoc Wireless Networks, Other Transport Layer Protocols for Ad hoc Wireless Networks , Security in Ad Hoc Wireless Networks , Network Security Requirements , Issues and Challenges in Security Provisioning , Network Security Attacks

SECTION-D

QoS AND ENERGY MANAGEMENT

Issues and Challenges in Providing QoS in Ad hoc Wireless Networks, Classifications of QoS Solutions , MAC Layer Solutions , Network Layer Solutions , QoS Frameworks for Ad hoc Wireless Networks.

Energy Management in Ad hoc Wireless Networks

Energy Management in Ad hoc Wireless Networks , Need for Energy Management in Ad hoc Wireless Networks – Classification of Energy Management Schemes – Battery Management Schemes – Transmission Power Management Schemes – System Power Management Schemes.

Reference:-

1. C. Siva Ram Murthy and B. S. Manoj, “Ad Hoc Wireless Networks Architectures and Protocols”, Prentice Hall, PTR, 2004.

2. C. K. Toh, “Ad Hoc Mobile Wireless Networks Protocols and Systems”, Prentice Hall, PTR, 2001.

3. Charles E. Perkins, “Ad Hoc Networking”, Addison Wesley, 2000

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Bachelor in Mobile Computing & Internet Batch 2014 onwards

MAJOR PROJECT (ANDROID)

(BMCI – 604)

Tools for Major Projects

Frontend:- **ANROID or JAVA**

Backend:- **SQLite or SQL**

In Major Project normal applications and one database related application is must

Note: The break up of marks for the External practical will be as under

Viva Voce	30 marks
System Development	100 marks
Project Report	70 marks

SEMINAR

(BMCI – 605)

Seminar based on whatever students have learned in the entire course from 1 to 6 sem in BMCI.

Note: - The break up is as follows:

Report:	30 marks
Presentation:	70 marks