Gondwana University, Gadchiroli

Choice Based Credit System (CBCS) Syllabus
Of

Master of Computer Application (MCA)
(Two Years Post Graduate Course)

Computer Science Board

2020-2021

Master of Computer Application –II

(Semester III)

MCA II (Semester III)

Subject	Paper Code	Paper Name	Total Period /Week	Credit	% of Assessment			
					IA	UE	Total	Min. Passing (40%)
Core	**PMCAT301**	**Advanced Web Development**	4	4	20	80	100	**40**
	PMCAT302	**Digital Cyber Security**	4	4	20	80	100	**40**
	PMCAT303	**Big Data & Hadoop**	4	4	20	80	100	**40**
Discipline Specific Elective (DSE)	**PMCAT304.1** **PMCAT304.2**	**Elective (Select any one)** 1. **Android Application Development** 2. **Mobile Computing**	4	4	20	80	100	**40**
Skill Enhancement Elective (SEE)	**PMCAT305.1** **PMCAT305.2**	**Elective (Select Any one)** 1. **Cloud Computing** 2. **Data Science**	4	4	20	80	100	**40**
Core Lab	**MCAP306**	**Lab on PSMCAT301, PSMCAT302 & PSMCAT303**	6	2	50	50	100	**40**
DSC & SEE based Lab	**MCAP307**	**Lab on PSMCAT304.1 or PSMCAT304.2**	6	2	50	50	100	**40**
Ability Enhancement	**PMCAS308**	**Seminar**	1	1	25	-	25	**10**
Total			33	25	255	470	725	290

- **Lab*:**

  1) Not more than two students should be allowed to do practical on one machine.

  2) Wherever possible Practical's should be perform using Open Source Software.

- **Batch:** Each batch can be of Maximum 12 students.

Master of Computer Application – II (Semester III)
Paper Code: PSMCAT301
Paper 1: Advanced Web Development

Credit : 4]   **[Max. Marks: 80**

Unit-I: Introduction to Core PHP

Introduction to PHP, Why PHP, Hardware & Software Requirements, Advantages of PHP Why PHP is better alternative, PHP Syntax, Data Types, Variables, Operators, Conditional Statements, Loops; Super Globals, String Manipulation, Working with Array, PHP functions, Working with Forms.

Unit-II: MySQL Database

MySQL Database - What is Database, Database Models, Tables, Records and Files, SQL Language, MySQL Command-Line. Working with PHPMyAdmin – Working with PHPMyAdmin, Creating Web Databases, Database Engines, and Data types in MySQL, Creating Fields Unique Key; Insert, Update, View & Delete Records, Drop Database/Tables, and Primary/Foreign Keys.

Unit-III: Advanced PHP Programming

Cookies – What is Cookie, Cookie Syntax, How to Create, Store, Retrieve and Delete Cookie. PHP File Upload – Create an Upload-File Form, Upload Script and Save Uploaded file, putting restrictions on uploads. PHP File Handling – Opening and Closing of a File, Check End-of-file, Reading a File – Line by Line and Character by Character. Session – What is Session? Creating, Storing and Destroying Sessions. Classes & Object – OO Concepts, Define Class, Class Attributes, An Object, Creating an Object, Object Properties & Methods, Object constructors and destructors, Static Method, Class Inheritance, Abstract Class, Implement Inheritance**.**

Unit-IV: PHP MYSQL Administration & Security

Advanced MySQL Administration– Understanding privilege system, making database secure. Authentication with PHP and MySQL: Identifying visitors. Controlling access. Basic authentication. Apache authentication. Custom authentication.

Books:

 1) Larry Ullman, "PHP 6 and MYSQL 5 for Dynamic Web Sites: Visual Quick Pro Guide", Peachpit Press, ISBN- 978-0321525994

2) Luke Welling, Laura Thomson, "PHP and MYSQL Web Development", 4th Edition, 2008 ISBN 978-0-672-32916-6

 3) Larry Ullman, "Effortless E-Commerce with PHP and MySQL", New Riders, 1st Edition, ISBN 978-0321656223

 4)   Janet Valade, "PHP MySQL for Dummies", Goels Computer Hut Publication, 4th Edition, 2012 ISBN: 9788126535118

 References:

1) Steven Holzner, "PHP: The Complete Reference", McGraw Hill Osborne, 1st edition, 2008, ISBN-978-0071508544

 2)   Sandy Carter, "Web Database Applications With Php And Mysql", Shroff Publication 2nd Edition 2004, ISBN-9788173669057

Credit: 4]   **[Max. Marks: 80**

Unit-I: Introduction to Internet Security

Need for Internet Security, Adopting Security Policies, Strategies for a Secure Network, Ethics of Computer Security, Security Threats and Levels, Security Plan (RFC 2196). Classes of Attacks: Stealing Passwords, Social Engineering, Bugs and Backdoors, Authentication Failures, Protocol Failures, Information Leakage, Exponential Attacks – Virus and Worms, Denial-of-Service-Attacks, Botnets, Active Attacks.

Unit-II: Computer Security

Introduction to Virus, Trojan Horses, Worms, Bombs, Protection against Virus, Structure of Virus. Firewalls: Introduction to Firewalls, Kinds of Firewalls: Packet Filters, Application-Level Filtering, Circuit-Level Gateways, Dynamic Packet Filters, Distributed Firewalls, Firewall Engineering: Rule sets, Proxies, Building a Firewall from Scratch, Firewall Problems and Testing Firewalls.

Unit-III: Safer Tools and Services

Authentication: Passwords, Smart Cards, Biometrics, RADIUS, SASL, Host-To-Host Authentication, PKI. Some Tools and Services: Ined-Network Services, Ssh-Terminal And File Access, Syslog, Network Administration Tools, Chroot-Caging Suspect Software, Jailing The Apache Web Server, Aftpd-A Simple Anonymous FTP Daemon, Mail Transfer Agents, POP3 And IMAP, Samba: An SMB Implementation, Taming Named, Adding SSL Support with Sslwrap.

Unit-IV: Cryptography and VPNs

Introduction to Cryptography, Notation, Secret-Key Cryptography, Modes of Operation, Public Key Cryptography, Exponential Key Exchange, Digital Signatures, Secure Hash Functions, Timestamps, Basic Encryption and Decryption. Introduction to VPNs, Advantages, Disadvantages of VPN, VPN Authentication and Authorization, VPN Threats and Exploits, Personal and Network VPNs, Hardware and Software VPNs, Differences between Layer2 and Layer3 VPNs

Books:

1) W. R. Cheswick, S. M. Bellovin, A. D. Rubin, "Firewalls and Internet Security-Repelling the Wily Hacker", Addison-Wesley Publication, "2nd Edition", Year- 2003, ISBN No- 0-201- 63466-X

2) J. Michael Stewart, "Network Security, Firewalls, and VPNs", Jones & Bartlett Publication, Year- 2011, ISBN N- 978-0-7637-9130-8

References:

1) Kenneth Einar Himma, "Internet Security: Hacking, Counter Hacking and Society", Jones & Bartlett Publication, "1st Edition", Year- 2007, ISBN No– 978-0-7637-3536-4

2) Man Young Rhee, "Internet Security: Cryptographic Principles, Algorithms and Protocols", J. Wiley Publication, Year- 2003, ISBN No- 978-0-4708-5285-9

Credit: 4]   **[Max. Marks: 80**

Unit I: Introduction to Big Data & Hadoop

Big Data: Introduction – distributed file system – Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications.

Hadoop: Apache Hadoop & Hadoop EcoSystem – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization.

Unit II: Hadoop Architecture

Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Task trackers - Cluster Setup – SSH & Hadoop Configuration.

Unit III: Hadoop Ecosystem and Yarn

Hadoop ecosystem components - Schedulers - Fair and Capacity, Hadoop 2.0 New Features- NameNode High Availability, HDFS Federation, HDFS Administering –Monitoring & Maintenance, MRv2, YARN, Running MRv1 in YARN.

Unit IV: HIVE and HIVEQL, HBASE

Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries, HBase concepts- Advanced Usage, Schema Design, Advance Indexing - PIG, Zookeeper - how it helps in monitoring a cluster, HBase uses Zookeeper and how to Build Applications with Zookeeper.

Books:
1. Chris Eaton, Dirk deroos et al. , "Understanding Big data ", McGraw Hill, 2012.
2. Tom White, "HADOOP: The definitive Guide" , O Reilly 2012.

References:
1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, "Professional Hadoop Solutions"Wiley, ISBN: 9788126551071, 2015.

Credit: 4] [Max. Marks: 80

Unit-I: Introduction to Open Source & Android
Introduction to Open Source: What is Open Source, License Issues (MPL, GPL, and LGPL) and Open Source Vs Traditional Development Methodologies. **Introduction to Android:** Introducing Android, History of Mobile Software Development, Open Handset Alliance, The Android Platform, Layers of Android, Android SDK, Kinds of Android Components, Building a Sample Android Application.

Unit-II: Android Application Design Essentials
Anatomy of an Android Applications, Android Terminologies, Application Context, Activies, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions, Managing Application resources in a hierarchy, Working with different types of resources.

Unit-III: Android User Interface Design Essentials
User Interface Screen Elements, Designing User Interfaces with Layouts, Drawing and Working with Animation.

Unit-IV: Using Common Android APIs
Using Android Data and Storage APIs, Managing data using SQLite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs.

Books:
1. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd Edition, 2011.
2. W. Frank Ableson, Robi Sen, Chris King, "Android in Action", 2nd Edition, Manning Publications Co., 2011, ISBN 978-1-935182-72-6.
3. Chris Haseman, "Android Essentials", Apress Publications, 2008, ISBN-13: 978-1-4302-1064-1.
4. James Steele, Nelson To, "The Android Developer's Cookbook-Building Applications with the Android SDK", Addison-Wesley Publications, 2011, ISBN-13: 978-0-321- 74123-3.

References:
1. Lucas Jordan, Pieter Greyling, "Practical Android Projects", Apress Pub., 2011, ISBN- 13: 978-1-4302-3243-8.
2. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt. Ltd., 2011.
3. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd, 2009.
4. Zigurd Mednieks, Laird Dornin, G. Blake Meike & Masumi Nakamura, "Programming Android", O'Reilly Publications, 2011.

Credit: 4]   **[Max. Marks: 80**

Unit I: INTRODUCTION

Mobile Computing: Mobile computing vs. wireless Networking, Mobile Computing applications, Characteristics of Mobile computing, Structure of Mobile Computing Application. MAC Protocols: Wireless MAC Issues, Fixed Assignment Schemes, Random Assignment Schemes, Reservation Based Schemes.

Unit II: MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER

Overview of Mobile IP, Features of Mobile IP, Key Mechanism in Mobile IP, Route Optimization. Overview of TCP/IP: Architecture of TCP/IP, Adaptation of TCP Window, Improvement in TCP Performance.

Unit III: MOBILE TELECOMMUNICATION SYSTEM

Global System for Mobile Communication (GSM): Introduction, Characteristics, Categories of services, Sub systems available in GSM, Functions of HLR and VLR. General Packet Radio Service (GPRS): Introduction, Features, Goals of GPRS, Services offered by GPRS, Purpose of EIR (Equipment Identity Register), Use of VOIP. Universal Mobile Telecommunication System (UMTS): Introduction, Elements of UMTS, Architecture of UMTS.

Unit IV: MOBILE AD-HOC NETWORKS

Ad-Hoc Basic Concepts: Characteristics, Applications, Design Issues, Routing Essential of Traditional Routing Protocols, Popular Routing Protocols. Vehicular Ad Hoc networks (VANET): Introduction to VANET, Characteristics of VANET, and Mobile Ad Hoc networks (MANET), Characteristics of MANET, MANET vs. VANET, Difference between Cellular and Ad hoc Network.

Text Books –
1) Raj Kamal, "Mobile Computing", Oxford, ISBN-0195680772/9780195686777.
2) Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, ISBN-0471413028.

References:
1) Jochen Schiller, "Mobile Comunications", Addison   Wesley, ISBN01398362/9780201398366.
 2) "Mobile Computing Principles", Designing and Developing Mobile, ISBN-0521817331.
   3) Reza Behravanfar, "Applications with UML and XML", Cambridge University Press, ISBN0521817331.

Master of Computer Application – II (Semester III)
Paper Code: PSMCAT305.1
Elective: Cloud Computing

Credit: 4]   **[Max. Marks: 80**

Unit – I: Fundamentals of Cloud Computing
Overview of Cloud Computing, Evolution of Cloud Computing, Types of Clouds, Key Characteristics of Cloud Computing, Intranets and Clouds. Benefits and challenges of cloud computing, Usage scenarios and Applications, Regulatory issues, major players in cloud computing.

Unit – II: Cloud Models & Services
Cloud Models – Benefits of Cloud Models, Public, Private, Hybrid, and Community Clouds Types of Clouds Services: SaaS, PaaS, IaaS, DaaS, MaaS, CaaS. Service Providers: Google App Engine, Microsoft Azure, Amazon EC2, IBM, Sales Force; Introduction to MapReduce, GFS, HDFS, Hadoop Framework.

Unit – III: Essentials & Collaborating with Cloud
Hardware and Infrastructure – Clients, Security, Network, Services; Accessing Cloud – Platforms, Web Applications, Web APIs, Web Browsers; Cloud Storage – Overview, Cloud Storage Providers; Standards – Application, Client, Infrastructure, Service; Centralizing Email Communications, Collaborating on Calendars, Schedules & Task Management, Event Management, Project Management and Contact Management.

Unit-IV: Virtualization & Security for Clouds
Need for Virtualization – Pros and Cons of Virtualization, Types of Virtualization, System VM, Process VM, Virtual Machine Monitor – Virtual Machine Properties, HLL VM, Hypervisor – VMWare, Virtual Box, Hyper-V; Case Studies on Cloud Data Centres. Security in Clouds – Cloud security challenges, SaaS as Service Security; Common Standards – Open Cloud Consortium, Distributed Management Task Force, Standards for Application Developers; Standards for Messaging – Standards for Security, End User access to cloud computing, mobile internet devices and the cloud.

Books:

1. Bloor R., Kanfman M., Halper F. Judith Hurwitz "Cloud Computing for Dummies" (Wiley India Edition) 2010, ISBN 978-0-470-48470-8.
2. John W. Rittinghouse & James F. Ransome, "Cloud Computing: Implementation, Management and Security", CRC Press, 1st Edition, 2009, ISBN 978-1439806807.
3. Antohy T Velte, Toby J. Velte, Robert Elsenpeter, Cloud Computing: "A Practical Approach", McGraw Hill, 2009. ISBN 978-0-07-068351-8
4. Michael Miller, Cloud Computing: "Web-Based Applications That Change the Way You Work and Collaborate Online", Que Publishing, August 2008. ISBN 978-0-7897-3803-5
5. James E Smith, Ravi Nair, "Virtual Machines", Morgan Kaufmann Publishers, 2006. ISBN 9788131203293

References:
1. George Reese, "Cloud Application Architecture", O'Reilly and Associates.
2. Haley Beard, "Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing", Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.

Credit : 4]   **[Max.Marks: 80**

UNIT – I: Introduction to Data Science

Benefits and uses of data science and big data, Facets of Data (Structured Data, Unstructured Data, Natural Language, Machine Generated Data, Graph Based on network data, Audio, Image and video Data, Streaming Data), The Data Science process(setting the research goal, Retrieving data, Data Preparation, Data exploration, Data Modeling or model building, Presentation and automation).

UNIT – II : Introduction To Python

Basic Concept, Python Identifiers And Reserved Words, Lines And Indentation, Multi-Line Statements, Comments, Print And Raw_Input()/Input, Command Line Arguments And Processing, Command Line Arguments, Standard Data Types - Basic, None, Boolean (True & False), Numbers, Python Strings, Data Type Conversion, Python Basic Operators (Arithmetic, Comparison, Assignment, Bitwise Logical), Python Membership Operators (In & Not In), Python Identity Operators (Is & Is Not), Operator Precedence, Control Statements, Python Loops, Mathematical Functions And Constants (Import Math), Random Number Functions

UNIT – IV :

Python strings, Concept, Slicing, escape characters, String special operations, String formatting operator, Triple quotes, Raw String, Unicode strings, Built-in String methods. Python Lists - concept, creating and accessing elements, updating & deleting lists, basic list operations **Python tuples and sets -** Concept (immutable), creating & deleting tuples, accessing values in a tuple, updating tuples, delete tuple elements, basic tuple operations, Indexing, slicing and Matrices, built in tuple functions. Sets - Concept, operations. **Python Dictionary -** Concept (mutable), creating and accessing values in a dictionary , updating dictionary, delete dictionary elements, properties of dictionary keys, built-in dictionary functions and methods, Object Oriented Programming in Python, Classes and Objects, Create new objects, Overload Operators, and utilize Python Special Methods.

UNIT-IV- Introduction to R Programming

History and Overview of R, Getting Started with R, R Nuts and Bolts, Getting Data In and Out of R, Using the **readr** Package, Using Textual and Binary Formats for Storing Data, Interfaces to the Outside World, Subsetting R Objects, Vectorized Operations, Dates and Times, Managing Data Frames with the **dplyr** package, Control Structures, Functions, Scoping Rules of R, Coding Standards for R, Loop Functions, Regular Expressions, Debugging, Profiling R Code, Profiling R Code, Simulation,

Books:

1. Davy Cielen,Arno D. B. Meysman,Mohamed Ali, "Introducing Data Science", Manning Publication,ISBN:9781633430037
2. Larry Ullman, "PHP 6 and MYSQL 5 for Dynamic Web Sites: Visual Quick ProGuide", Peachpit Press, ISBN- 978-0321525994
3. Bill Lubanovic, "Introducing Python", Shroff Publication
4. Roger D. Peng "R Programming for Data Science"Leanpub

References

1. Joseph Joyner, "Python Programming for Begnners", ISBN 13-978163383039

Master of Computer Application – II (Semester III)
Paper Code: PSMCAT306
Practical List

Credit: 2]   **[Max. Marks: 100**

Practical List on Advance Web Development

1) Write a PHP program to display the today‟s date and current time.

2) Write a PHP program to calculate sum of given number.

3) Write a PHP program to display the Fibonacci series.

4) Write PHP program to display current day using switch case.

5) Write a PHP program to prepare student Mark sheet using Switch statement.

6) Write a PHP program to demonstrate the use of array.

7) Write a PHP program to display the use of associative array.

8) Write a PHP program to display the use of multidimensional array.

9) Write a PHP program to generate the multiplication of matrix.

10) Write a PHP program for reading the content of file.

11) Write PHP program to copy the content of a file.

12) Write PHP program to append a file

13) Write a PHP Program for Create, Delete, and Copying file from PHP   Script.

14) Write a PHP Program to Recursive Traversals of Directory.

15) Write PHP program to test for function‟s existence.

16) Write a program to build a simple HTML form.

17) Write a program to build an HTML form including multiple   checkboxes.

18) Write a program to Add an Array Variable to a Session Variable.

19) Write a PHP program to send Mail from PHP Script.

20) Write a PHP program to read the employee detail using form component.

21) Write a PHP program to create a table in mysql database .

22) Write a PHP program to insert a record into a table in mysql

23) Write a PHP program to select a record from a table in mysql database .

Master of Computer Application – II (Semester III)
Paper Code: PSMCAT307
Practical List

Credit: 2]   **[Max. Marks: 100**

Practical List on Android Application Development

1. Develop an application that uses GUI components, Font and Colours

2. Develop an application that uses Layout Managers and event listeners.

3. Develop a native calculator application.

4. Write an application that draws basic graphical primitives on the screen.

5. Develop an application that makes use of database.

6. Develop an application that makes use of RSS Feed.

7. Testing your android development environment perform following operations.

       a. Add the sample application to a project in your eclipse workspace.

       b. Create an Android Virtual Device (AVD) for your sample project.

       c. Create a launch configuration for your sample project.

       d. Run your sample application in Android Emulator.

8. Write a program to build your first Android Application "Hello World" with common activity.

9. Write a program which will implement Sub menu in android application.

10. Write a program which will implement Context menu (Floating List of Menu Items) in android application.

11. Write a program to displays the use of Relative Layout Views with different attributes.

12. Write a program to displays the use of Linear Layout Views with different attributes.

13. Write a program to implement a menu which uses check-able items in Menu.

14. Write a program to implement a Custom Button and handle the displayed message on button press.

15. Write a program to implement the Table layout in View Group that displays child View elements in rows and columns.

16. Write a program to implement the List View in your android application.

17. Write a program to implement tween animation and rotate the text in your android application.

18. Write a sample program to create a progress bar for your android applications.

19. Write a program to show how to use Date picker control of ADK in your android applications.

20. Write a program which enables you to draw an image using bitmap class object.

21. Implement an application that implements Multi-threading

22. Develop a native application that uses GPS location information.

23. Implement an application that writes data to the SD card.

24. Implement an application that creates an alert upon receiving a message.

25. Write a mobile application that creates alarm clock

26. Write a program which shows you how to handle any type of interruption in your android application.

27. Write a program which allows you to set an image as wallpaper.

28. Write a program which allows you to get image from web and displayed them using the Image View.

29. Write a program which shows you how to create a scrollview when text is not visible on one page.

30. Write a program which will shows you how to run any video file.

Practical List on Mobile Computing

01. Design a prototype that implements the Cache management for a mobile computing environment.

02. Design a system: The challenges of developing high performance, high reliability and high quality software systems are too much for ad-hoc and informal engineering techniques that might have worked in the past on less demanding systems. New techniques for managing these growing complexities are required to meet today's time to market, productivity and quality demands.

03. To study a peer to peer decentralized network system and resource management with in that system.

04. Write a program that implements a few sorting algorithms (bubble, selection etc.) for n data. It stops the operation when the counter for sorting index is at 100,1000,10000 and so on, stores the contents of the registers, program counter and partially sorted list of data etc. It resumes the operation after 30 seconds from the point of termination

05. Write a program that implements the Quick sort and Selection sort for n data. Its stops the operation when the counter for sorting index is at 100, 1000, 10000 and so on, stores the contents of the registers, program counter and partially sorted list of data etc. It transfer the code and data across the network on the new destination and resumes the operation from the point of termination on the previous node. Finally the result from the last node is send back to the process initiator node.

06. Study of Cellular Architecture.

07. Develop a prototype that performs parallel computation of the same task on different node. Finally process initiator receives the result and computation time required to complete the task on the node and displays to the user.

Master of Computer Application –II

(Semester IV)

MCA II (Semester IV)

Subject	Paper Code	Paper Name	Total Period /Week	Credit	% of Assessment			
					IA	UE	Total	Min. Passing (40%)
Core	PSMCAP401	Research Methodology	4	4	20	80	100	40
	PSMCAP402	Cyber Law & IPR	4	4	20	80	100	40
Skill Enhancement	PSMCAP403	Industrial Internship Project (IIR)	-	18	250	250	500	200
Ability Enhancement	PSMCAS404	Seminar	1	1	25	-	25	10
Total			8	27	290	430	700	280

Master of Computer Application – II (Semester IV)
Paper Code: PSMCAT401
Paper 1: Research Methodology

Credit: 4]   **[Max. Marks: 80**

Unit I: Research Methodology

An Introduction, Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, and Research Methods versus Methodology, Research and Scientific Method, Importance of Knowing How Research is Done, Research Process, Criteria of Good Research, and Problems Encountered by Researchers in India. Defining the Research Problem: What is a Research Problem? , Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem**.**

Unit II: Research Design

Meaning of Research Design, Need for Research Design, Features of a Good Design, Different Research Designs, Basic Principles of experimental Designs, Developing a Research Plan. Sampling Design: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design, Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design , Different Types of Sample Designs ,How to Select a Random Sample?, Random Sample from an Infinite Universe, Complex Random Sampling Designs**.**

Unit III: Measurement and Scaling Techniques

Measurement in Research ,Measurement Scales ,Sources of Error in Measurement ,Tests of Sound Measurement, Technique of Developing Measurement Tools ,Scaling, Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Collection of Primary Data. Processing and Analysis of Data: Processing Operations, Some Problems in Processing, Elements/Types of Analysis, Statistics in Research, Measures of Relationship, Simple Regression Analysis, Multiple Correlation and Regression, Partial Correlation, Other Measures, Need for Sampling**.**

Unit IV: Hypothesis

What is Hypothesis?, function and importance of Hypothesis, Chi-square as a Test for Comparing Variance, Chi-square as a Non-parametric Test, Conditions for the Application of c2 Test, Steps Involved in Applying Chi-square Test, Yates' Correction, Important Characteristics of c2 Test, Caution in Using c2 Test. Analysis of Variance and Covariance: What is ANOVA?, The Basic Principle of ANOVA , ANOVA Technique, Setting up Analysis of Variance Table, Short-cut Method for One-way ANOVA ,Coding Method ,Two-way ANOVA, ANOVA in Latin-Square Design.

Books:

1) Kothari .C.R, "Research Methodology-Methods and techniques", New Age Publications, ISBN-978-81-224-2488-1

Credit: 4]   [Max. Marks: 80

Unit - I: Principles & Acquisition of IPR

Philosophical Aspects of Intellectual Property Laws, Basic Principles of Patent Law, Patent Application Procedure, Drafting of a Patent Specification, Understanding Copyright Law, Basic Principles of Trade Mark, Basic Principles of Design Rights, International Background of Intellectual Property.

Unit - II: IT related to IPR

Computer Software and Intellectual Property-Objective, Copyright Protection, Reproducing, Defences, Patent Protection.
Domain Name Protection- Objectives, Domain Name and Intellectual Property, Registration of Domain Names, disputes under Intellectual Property Rights, Jurisdictional Issues and International Perspective.
Enforcement of Intellectual Property Rights - Civil Remedies, Criminal Remedies, Border Security measures.

Unit-III: Patents (Ownership and Enforcement of Intellectual Property) :

Patents - Objectives, Rights, Assignments, Defences in case of Infringement. Copyright - Objectives, Rights, Transfer of Copyright, work of employment Infringement, Defences for infringement Trademarks-Objectives, Rights, Protection of good will, Infringement, Passing off, Defences. Designs - Objectives, Rights, Assignments, Infringements, Defences of Design Infringement.

Unit-IV: Cyber Law & issues related to IPR

Introduction to Cyber Law, Scope of Cyber Laws, Cyber Jurisprudence. Intellectual Property issues in Cyber Space. Cyber Law Issues for Management: Cyber Law Issues in E-Business Management, Major issues in Cyber Evidence Management, Cyber Law Compliancy Audit.

Text Books:

1. V. V. Sopale, "Managing Intellectual Property: The Strategic Importance", 2nd Edition, PHI Publication
2. Peter Weill, Jeanne Ross, "IT Governance: How Top Performers Manage IT Decision Rights for Superior Results" 1st Edition, Harvard Business Review Press, June 2004, ISBN-101591392535, ISBN -13: 978-1591392538.
3. Caryn R. Leland, "Licensing Art & Design" Allworth Press Publication.

References:

1. Jeanne W. Ross, "Enterprise Architecture as Strategy: Creating a Foundation for Business Execution"
2. Peter Weill "IT Savvy: What Top Executives Must Know to Go from Pain to Gain
3. How To Register Your Own Copyright by Marx Warda, Sphinx Publishing

Credit : 10]   **[Max. Marks: 500**

Instruction:

Towards the end of the second semester of study of Final year, a student will be examined in the course **"INDUSTRIAL INTERNSHIP PROJECT"**. **The project proposal should be prepared in consultation with the Internal Guide approved by Company/Software firm along with college guide (Guide must be a person having a regular university approval only).**

a. Project Work must be done by individually (Only One) while carrying the industrial project. However if project is done in group then, each student must be given a responsibility for a distinct module and care should be taken to monitor the progress of individual student.

b. The Project Work should be done as per the guidelines of Company/Software Firm.

c. The Project Work should be of such a nature that it could prove useful or be relevant from the System-Oriented/Application/Commercial.

d. The external viva-voce examination for Project Work would be held as per Examination Time Table of the Final year of study decided by University.

e. Head/Co-ordinator of Computer Dept. must reject any project title which was previously carried out in any computer course. It must maintain Record that lists the projects along with other detail (like Guide, Session, and Number of students working on project etc.) that was carried out of and must be shown to external examiner at the time of examination.

f. HOD may change the sequence/order of project work depending upon the nature of project.

Types of Project

As majority of the students are expected to work out a project in some industry/research and development laboratories/educational institutions/software export companies, it is suggested that the project is to be chosen by the candidate should have some direct relevance in day-to-day activities of the candidates in his/her institution.

The Applications Area of Project- Database Management System/Relational Database Management System/Internet/web Designing/Hardware and Software interaction based etc.

Project Proposal (Synopsis)

The project proposal should clearly state the objectives and environment to the proposed project to be undertaken. It should have full details in the following form:

1. Title of the Project

2. Objectives and Hypothesis of the Project

3. Project Category (Database/Web Designing/Application/Hardware Interface etc.)

4. Tools/Platform, Languages, to be used as per the guidelines of company/software firms.

5. A complete Structure of the program:

    i. Analysis

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    ii. Numbers of Modules

    iii. Data Structures or Tables

    iv. Process Logic

    v. Types of Report Generation

6. Scope of future Application

Project Report Formulation

1. Title Page

2. Certificate Page

3. Declaration Page

4. Acknowledgment Page

5. Index or Content Page

6. Documentation.

    i) Introduction/Objectives

    ii) Preliminary System Analysis: Identification of Need, Preliminary Investigation Feasibility Study, Need of New System. Flaws in Present System

    iii) Project Category

    iv) Software Requirement Specification

    v) Detailed System Analysis. Data Flow Diagram. Numbers of Modules and Process Logic. Data Structures and Tables. Entity-Relationship Diagram.

    vi) System Design, Source Code, Screen Shots

    vii) Validation Checks

    viii) Implementation, Evaluation and Maintenance

    ix) Security Measures taken

    x) Future Scope of the Project xi) Bibliography

Appendix

    O Survey Questionnaire

Master of Computer Application – III (Semester VI)
Paper Code : PSMCAT602
Paper 2: Seminar

Work Credit : 5]   **[Max. Marks: 200**

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The seminar must be based on some current trends related to IT/Computer Science/Computer Application. A Student must present the PowerPoint presentation along with Seminar Report. Students are requested to follow the following guidelines while choosing & preparing their seminars.

Guidelines to MCA Seminar

1) Name of seminar topic must be latest to the current trends and should not be repeated.

2) Seminar topic is to be approved by the concerned guide before the deadline prescribed by
university time-table.
3) Seminar should be given individually.

4) Students are allowed to use graphics/animation/audio-video aids for their presentation.

5) Seminar work comprised of both Internal and External examination.

6) Students are requested to submit their seminar reports on or before the deadline with the
concern of their respective guide otherwise students will be responsible for any appropriate action.
7) Seminar Report should be typed/printed in double line space using A4 size bond papers

with a left margin of 1.5" and right margin of 1.0" with proper spiral binding to be done.

8) Students are requested to obtained necessary certificates and declaration to be duly
enclosed in the report.