Eklavya University

SESSION

2023-24

M.C.A. IV SEMESTER

SYLLABUS

OF

Computer Application And Information Technology Department

School of Basic and Applied Sciences

EKLAVYA UNIVERSITY, DAMOH (M.P.)

Scheme of Examination MCA IV SEM

/For batch admitted in Academic Session 2023-24/

Subject wise distribution of marks and corresponding credits

S.No.	Subject Code	Subject Name	Maximum Marks Allotted					Total Marks	Contact Periods Per week			Total Credits
			Theory Slot			Practical Slot						
			End Sem.	Tests	Quiz/ Assignment/ Attendance	End Sem	Lab Work/ sessional		L	T	P	
1	MCAPL20S401	Elective – I	60	30	10	-	-	100	3	1	-	4
2	MCAPL20S402	Elective – II	60	30	10	-	-	100	3	1	-	4
3	MCAPL20S403	Elective – III	60	30	10	-	-	100	3	1	-	4
4	MCAPL20S404	Major Project	-	-	-	250	100	350	-	-	14	14
5	MCAPL20S405	Elective -1 Lab	-	-	-	60	40	100	-	-	4	4
		Total	180	90	30	310	140	750	9	3	18	30

Induction programme of three weeks (MC): Physical activity, Creative Arts, Universal Human Values, Literary, Proficiencey Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations.

Elective – I
A.Advanced Python
B.Advanced Web Technology
C. Big data with Analytics

Elective-II
A.Deep Learning
B. Cloud Computing Technologies
C. Digital marketing

Elective-III
A. Information Security
B. Block Chain and Cryptocurrency
C. Mobile Computing

School of Basic & Applied Sciences

Class	**Master of Computer Application (MCA) II YEAR**
Semester/Year	**IV Semester**
Elective Paper	**Elective - I**
Subject & Subject Code	**Advanced Python (1A) - MCAPL20S401**
Max. Marks	**60 (ETE) + 40 (IA) = 100**

Credit			Total Credits
L	T	P	4
3	1	0	

Course Objectives:

This is a second course in Python. The emphasis is learning about the modules available in Python and how to extend them. The course starts with a complete review of OO programming in Python including abstract base classes and the Python programmer's tools—a debugger, trace. Then containers, algorithms, and iterators are presented to show fast methods of processing huge amounts of data. File system manipulation and XML, JSON, and YAML are viewed so that they can be manipulated inside of Python.

Course Outcome:

1. Know how to use a debugger, PyUnit, docTest, logging, and special environments.
2. Be able to program decorators, closures, lambda, and list comprehensions.
3. Understand how iterators and generators work.
4. Learn modern data structures to include collections, array, and queues.
5. Use platform independent file manipulation, file pattern matching.
6. Know how to use mmap and temporary files.

Student Learning Outcomes (SLO):

1. Be able to set up a client-server program using WebApp2 or Flask
2. Know how to use the Request module
3. Understand the design and Python implementation of REST
4. Know how to use threads and multiprocessing

Unit	Syllabus	Periods
UNIT - I	Introduction to Python, use IDE to develop programs, Basic coding skills, working with data types and variables, working with numeric data, working with string data, Python functions, Boolean expressions, selection structure, iteration structure, working with lists,work with a list of lists, work with tuples, work with dates and times, get started with dictionaries.	8
UNIT - II	Classes in Python: OOPS Concepts, Classes and objects , Classes in Python, Constructors,Data hiding, Creating Classes, Instance Methods, Special Methods, Class Variables,Inheritance, Polymorphism, Type Identification, Custom Exception Classes, Iterators,generators and decorators.	8
UNIT - III	I/O and Error Handling In Python :Introduction, Data Streams, Creating Your Own Data Streams, Access Modes, Writing Data to a File, Reading Data From a File, Additional File Methods, Handling IO Exceptions, Errors, Run Time Errors, The Exception Model,Exception Hierarchy, Handling Multiple Exceptions, Working withDirectories.	8

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Unit	Syllabus	Periods
UNIT - IV	An Introduction to relational databases: SQL statements for data manipulation, Using SQLite Manager to work with a database, Using Python to work with a database, Creating a GUI that handles an event, working with components.	8
UNIT - V	Implement Machine Learning algorthims:Usage of Numpy for numerical Data, Usage of Pandas for Data Analysis, Matplotlib for Python plotting, Seaborn for Statistical plots,interactive Dynamic visualizations, SciKit for Machine learning.	8

References Books:

1 Michael Urban and Joel Murach, Python Programming, Shroff/Murach,2016

2 Haltermanpython

3 Mark Lutz, Programming Python, O`Reilly, 4th Edition,2010.

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Class	**Master of Computer Application (MCA) II YEAR**
Semester/Year	**IV Semester**
Elective Paper	**Elective - I**
Subject & Subject Code	**Advanced Web Technology (1B) - MCAPL20S402**
Max. Marks	**60 (ETE) + 40 (IA) = 100**

Credit			Total Credits
L	T	P	4
3	1	0	

Course Objectives:

On completion of this course, a student will be familiar with client server architecture and able to develop a web application using java technologies To create fully functional website/web application with MVC architecture.

Course Outcome:

1.Students are able to develop a dynamic webpage by the use of java script and DHTML.
2.Students will be able to connect a java program to a DBMS and perform insert,update and delete operations on DBMS table.
3.Students will be able to write a server side java application called Servlet to catch form data sent from client, process it and store it on database.
4.Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database

Student Learning Outcomes (SLO):

1.define the fundamental ideas and standards underlying Web Service Technology.
2.define the fundamental principles for cloud applications.
3.discuss concepts at the frontier of industrial practice and emerging standards.
4.differentiate the major frameworks allowing to develop web services and cloud applications and assess their suitability for specific usage scenarios.

Unit	Syllabus	Periods
UNIT - I	Responsive web design and introduction to Bootstrap : Bootstrap grid, bootstrap components and plugins.	8
UNIT - II	XML- Introduction to XML, Comparing XML with HTML, Describing the Structure of XML -Declaration, Elements, Attributes, Comments, CDATA, XML Entity References, Parsers ,Describing Document Type Definitions, Using XSLT with XML :xsl:template Element, xsl:apply-templates Element,xsl:import , xsl:include Element,Element,xsl:element Element, xsl:attribute Element, xsl:value-of Element, using Conditional Statements, Sorting Elements, XSLTfunctions, Creating Well-formed and Valid Documents.	8

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UNIT - III	Introduction to Ajax – AJAX Web Application Model, Working of AJAX, Asynchronous Data Transfer with XMLHttpRequest - Creating the XMLHttpRequest Object, XMLHttpRequest Properties, XMLHttpRequest Methods, Using the XMLHttpRequest Object in Different Browsers, Reading a File Synchronously, Reading a File Asynchronously, Performing Tasks Using the XMLHttpRequest Object, Integrating PHP and AJAX-Sending Data from a Web Application to a Server, Validating a Field Using AJAX and PHP.	8
UNIT - IV	Handling XML Data using PHP and AJAX-JavaScript, properties for Extracting with nodeValue,Accessing XML, Elements by Name, Accessing Attribute Values in XML Elements. Validating XML Documents in Ajax Applications Retrieving Data from a Database Using PHP and AJAX Consuming Web Services Using AJAX-Exploring Web Service Protocols-SOAP,Web Service Description Language, UDDI, REST, Consuming Web Services Using AJAX.	8
UNIT - V	jQuery-JavaScript DOM objects their methods and properties-Window, History, Location Document, Form etc. Fundamentals of jQuery, Loading and using jQuery,using jQuery Library files, Callback functions, jQuery Selectors , jQuery Methods to Access HTML Attributes, jQuery Methods of traversing, jQuery Manipulators, jQuery Events, jQuery Effects, jQuery with AJAX	8

References Books:

1 Bootstrap: Responsive Web Development

2 XML: A Beginner's Guide by Steven Holzner

3 AJAX For Beginners , Ivan Bayross and Sharanam Shah, SPD

4 Web Development with jQuery (WROX) by Richard York

5 Ajax in Action Dave Crane, Eric Pascarello, Darren James

6 Ajax for Dummies Steve Holzner,PhD, Wiley Publishing Inc.

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Class	**Master of Computer Application (MCA) II YEAR**
Semester/Year	**IV Semester**
Elective Paper	**Elective - I**
Subject & Subject Code	**BIG DATA ANALYTICS (1C) - MCAPL20S403**
Max. Marks	**60 (ETE) + 40 (IA) = 100**

Credit			Total Credits
L	T	P	4
3	1	0	

Course Objectives:

1. To study the basic technologies that forms the foundations of Big Data. .
2. To study the programming aspects of cloud computing with a view to rapid prototyping of complex applications.
3. To understand the specialized aspects of big data including big data application, and big data analytics.
4. To study different types Case studies on the current research and applications of the Hadoop and big data in industry.

Course Outcome:

1.Student must be Able to understand the building blocks of Big Data.
2.Student must be able to articulate the programming aspects of cloud computing(map Reduce etc).
3.Student must be able to understand the specialized aspects of big data with the help of different big data applications.
4.Student must be able to represent the analytical aspects of Big Data.

Student Learning Outcomes (SLO):

1. Students will demonstrate knowledge of big data analytics.
2. Students will demonstrate the ability to think critically in making decisions based on data and deep analytics.
3. Students will demonstrate the ability to use technical skills in predicative and prescriptive modeling to support business decision-making.
4. Students will demonstrate the ability to translate data into clear, actionable insights.
5. Students will demonstrate effective communication skills that facilitate the effective presentation of analysis results.

Unit	Syllabus	Periods
UNIT - I	INTRODUCTION TO BIG DATA Evolution of Big data – Best Practices for Big data Analytics – Big data characteristics –Validating – The Promotion of the Value of Big Data – Big Data Use Cases- Characteristics of Big Data Applications –. Perception and Quantification of Value -Understanding Big Data Storage – A General Overview of High-Performance Architecture – HDFS – MapReduce and YARN – Map Reduce Programming Model.	8

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UNIT - II	CLUSTERING AND CLASSIFICATION Advanced Analytical Theory and Methods: Overview of Clustering – K-means – Use Cases – Overview of the Method – Determining the Number of Clusters – Diagnostics – Reasons to Choose and Cautions .- Classification: Decision Trees – Overview of a Decision Tree – The General Algorithm – Decision Tree Algorithms – Evaluating a Decision Tree – Decision Trees in R – Naïve Bayes – Bayes' Theorem – Naïve Bayes Classifier.	8
UNIT - III	ASSOCIATION AND RECOMMENDATION SYSTEM Advanced Analytical Theory and Methods: Association Rules – Overview – Apriori Algorithm – Evaluation of Candidate Rules – Applications of Association Rules – Finding Association & finding similarity – recommendation System: Collaborative Recommendation- Content Based Recommendation – Knowledge Based Recommendation- Hybrid Recommendation Approaches.	8
UNIT - IV	STREAM MEMORY Introduction to Streams Concepts – Stream Data Model and Architecture – Stream Computing,Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream –Estimating moments – Counting oneness in a Window – Decaying Window – Real time Analytics Platform(RTAP) applications – Case Studies – Real Time Sentiment Analysis, Stock Market Predictions. Using Graph Analytics for Big Data: Graph Analytics.	8
UNIT - V	V NOSQL DATA MANAGEMENT FOR BIG DATA AND VISUALIZATION 9 NoSQL Databases : Schema-less Models : Increasing Flexibility for Data Manipulation-Key Value Stores- Document Stores – Tabular Stores – Object Data Stores – Graph Databases Hive –Sharding –-Hbase – Analyzing big data with twitter – Big data for E-Commerce Big data for blogs – Review of Basic Data Analytic Methods using R.	8

References Books:

1. Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press
2. David Loshin, "Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph", Morgan Kaufmann/El sevier Publishers, 2013
3. EMC Education Services, "Data Science and Big Data Analytics: Discovering, Analyzing,Visualizing and Presenting Data", Wiley publishers,2015.

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Class	**Master of Computer Application (MCA) II YEAR**
Semester/Year	**IV Semester**
Elective Paper	**Elective - II**
Subject & Subject Code	**DEEP LEARNING (2A) - MCAPL20S404**
Max. Marks	**60 (ETE) + 40 (IA) = 100**

Credit			Total Credits
L	T	P	4
3	1	0	

Course Objectives:

1. To understand the basic component of Machine Learning.
2. To explore the application areas of Neural Networks.
3. To understand the idea of Recurrent Neural Networks.
4. To explore the basic concepts of Feed forward Neural Networks.
5. To understand the concepts of mathematical modelling.

Course Outcome:

1 Able to differentiate between machine learning and deep learning
2 Identify problems suitable for application of deep learning.
3 Illustrate the working of FF Neural Networks and their modifications.
4 Apply Convolutional & Recurrent Neural Networks to solve problems
5 Analyse the efficiency of deep learning systems.

Student Learning Outcomes (SLO):

1. describe the feedforward and deep networks.
2. design single and multi-layer feed-forward deep networks and tune various hyper-parameters.
3. analyse performance of deep networks.

Unit	Syllabus	Periods
UNIT - I	NEURAL NETWORK Building Intelligence Machine-Expressing Linear Perceptron as Neurons-Feed Forward Neural Netwoks - Activation function. Supervised and Unsupervised Learning:Single Layer Perceptron Perceptron Learning Algorithm – Least Mean Square Learning Algorithm - Multilayer Perceptron – Back Propagation Algorithm – XOR problem – Limitations of Back Propagation Algorithm- Implementing Neural Networks in TensorFlow.	8
UNIT - II	CONVOLUTION NEURAL NETWORK Introduction-Filter and Feature Maps-Full Description of CNN-Max Pooling- Full Architectural Description of CNN-Image Preprocessing Pipeline Enable More Roburst Models-Accelerating Training with Batch Normalization-Visualizing Learning with Convolution NetworkLeveraging and Learning Convolution Filters - Predefined Convolutional Filters Network (PCFNet)- Transfer Learning with Convolutional Neural Networks.	8

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UNIT - III	DEEP NETWORKS History of Deep Learning- A Probabilistic Theory of Deep Learning-Backpropagation and regularization, batch normalization- VC Dimension and Neural Nets-Deep Vs Shallow Networks - Convolutional Networks- Generative Adversarial Networks (GAN), Semisupervised Learning.	8
UNIT - IV	OPTIMIZATION AND GENERALIZATION Optimization in deep learning– Non-convex optimization for deep networks-Stochastic Optimization Generalization in neural networks- Spatial Transformer Networks- Recurrent networks, LSTM - Recurrent Neural Network Language Models- Word-Level RNNs & Deep Reinforcement Learning.	8
UNIT - V	DEEP REINFORCEMENT LEARNING Markov Decision Processes-Explore versus Exploit-Policy versus Value Learning-Pole-Cart with Policy Gradients-Q Learning and Deep Q Networks-Improving and Moving Beyond DQN.	8

References Books:

1. Nikiil Buduma, Nicholas Locascio, "Fundamentals of Deep Learning: Designing NextGeneration Machine Intelligence Algorithms", First Edition, O'ReillyMedia, 2017
2. SudharsanRavichandiran, Hands on Deep Learning Algorithms with Python, FirstEdition, Packt Publishing Limited, 2019.
3. François Chollet, Deep Learning with Python, First Edition,Manning Publications Company, 2017.
4. Ian Goodfellow, YoshuaBengio and Aaron Courville, Deep Learning, First editionMIT Press, London, 2016
5. Rachel Schutt, Cathy O'Neil, "Doing Data Science", O'Reilly

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Class				**Master of Computer Application (MCA) II YEAR**
Semester/Year				**IV Semester**
Elective Paper				**Elective - II**
Subject & Subject Code				**Cloud Computing Tecnhologies (2B) - MCAPL20S405**
Max. Marks				**60 (ETE) + 40 (IA) = 100**
Credit			**Total Credits**	
L	**T**	**P**	**4**	
3	**1**	**0**		

Course Objectives:

1. Identify the technical foundations of cloud systems architectures.
2. Analyze the problems and solutions to cloud application problems.
3. Apply principles of best practice in cloud application design and management.
4. Identify and define technical challenges for cloud applications and assess their importance.

Course Outcome:

1. Understand the fundamental principles of distributed computing.
2. Understand how the distributed computing environments known as Grids can be built from lower level services.
3 .Analyze the performance of Cloud Computing.
4. Understand the concept of Cloud Security.
5. Learn the Concept of Cloud Infrastructure Model.

Student Learning Outcomes (SLO):

1. Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
2. Apply fundamental concepts in cloud infrastructures to understand the tradeoffs in power, efficiency and cost, and then study how to leverage and manage single and multiple datacenters to build and deploy cloud applications that are resilient, elastic and cost-efficient.
3. Discuss system, network and storage virtualization and outline their role in enabling the cloud computing system model.
4. Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS.
5. Analyze various cloud programming models and apply them to solve problems on the cloud.

Unit	Syllabus	Periods
UNIT - I	Cloud Computing Fundamentals: Cloud Computing definition, Types of cloud, Cloud services: Benefits and challenges of cloud computing, Evolution of Cloud Computing , NIST architecture of cloud computing, Applications cloud computing, Business models around Cloud – Major Players in Cloud Computing - Eucalyptus ,Nimbus ,Open Nebula, CloudSim, VMware.	8

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UNIT - II	Types of Computing and Clouds: Cluster Computing, Grid Computing, Grid Computing Versus Cloud Computing, Key Characteristics of Cloud Computing, Cloud Models, Benefits of Cloud Models, Public Cloud, Private Cloud, Hybrid Cloud, Community Cloud, Shared Private Cloud, Dedicated Private Cloud, and Dynamic Private Cloud.	8
UNIT - III	Cloud Services and File System: Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service- Monitoring as a Service – Communication as services. Service providers- Google App Engine, Amazon EC2, Microsoft Azure, Sales force, Clarizen.	8
UNIT - IV	Virtualization: Basics of Virtualization, Types of Virtualization, Implementation Levels of Virtualization, Virtualization Structures, Tools and Mechanisms , Virtualization of CPU,Memory, I/O Devices and OS ,Virtualization for Data-center Automation, Introduction to MapReduce, GFS, HDFS, Hadoop Framework.	8
UNIT - V	Security in the Cloud: Security Overview – Cloud Security Challenges and Risks – Software-asa-Service Security – Security Monitoring – Security Architecture Design – Data Security –Application Security – Virtual Machine Security - Identity Management and Access Control –Autonomic Security.	8

References Books:

1. Cloud Computing "A Practical Approach" Anthony T. Velte, Toby J. Velte, Robert Elsenpeter. McGrawHill. Kai Hwang, Geoffrey C Fox, Jack G Dongarra
2. Kumar Saurabh, " Cloud Computing – insights into New -Era Infrastructure", Wiley India, 2011
3. Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guide to Secure Cloud Computing", Wiley – India
4. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH, 2009.
5. "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012

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Class	**Master of Computer Application (MCA) II YEAR**
Semester/Year	**IV Semester**
Elective Paper	**Elective - II**
Subject & Subject Code	**Digital Marketing (2C)- MCAPL20S406**
Max. Marks	**60 (ETE) + 40 (IA) = 100**

Credit			Total Credits
L	T	P	4
3	1	0	

Course Objectives:

1.To understand about the Social Media and its importance for marketing success.
2. To understand the process of integration of different digital media and create marketing content.
3. To understand planning &control activities to effectively deliver goods and services.
4. To learn principles of marketing, economics, accounting, operations management, and finance.
5. To develop and implement social media strategies for B2B and B2C marketing for penetration, growth, and development.

Course Outcome:

1. Identify importance of the social media marketing for marketing success
2. Demonstrate to create a blog and a social media marketing plan for a new product or service.
3. Explain about Social Media, its various channels of operations, and its role in marketing strategy
4. Use principles of consumer and social psychology to develop social media content and campaigns that engage consumers
5. Draw on knowledge about word-of-mouth marketing to develop effective approaches for propagating ideas, messages, products, and behaviors across social networks
6. Measure the impact of a social media campaign in terms of a specific marketing objective.

Student Learning Outcomes (SLO):

1. Explain the role and importance of digital marketing in a rapidly changing business landscape
2. Discuss the key elements of a digital marketing strategy
3. Illustrate how the effectiveness of a digital marketing campaign can be measured
4. Demonstrate advanced practical skills in common digital marketing tools such as SEO, SEM, Social media and Blogs

Unit	Syllabus	Periods
UNIT - I	Introduction to Digital Marketing:What is Digital Marketing,Why Digital Marketing,Digital Marketing platforms,Digital Marketing – Organic & Paid,Digital Marketing era and the way forward,Digital Marketing for students, professionals and businesses Search Engine Optimization (SEO):What is SEO,Growth of SEO in the recent years,Ecosystem of a search engine,What are the kinds of traffic.	8
UNIT - II	On Page Optimisation (OPO):What is on-page optimization,HTML basics,CSS basics,Meta Tags usage,Using Javascript to our Advantage,Graphics Optimization,Contextual interlinking,Microformats & schemas,Improving demographic score Off-Page Optimization:Linking Strategies,Competitor Analysis,Sculpting,Link Baiting,Professional Article Exchange,Social Book Marking and Promotions,Directory submissions.	8

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UNIT - III	Search Engine Marketing (SEM):Introduction to SEM,SEM platforms – paid platforms,Introduction to Google AdWords,What is Google AdWords?,How is it different from other platforms?,Create an AdWords account,Key terminologies in Google AdWords,Google AdWords Account Structure,Ad approval process,Campaign creation process,Search & Display network,Keyword Match types,Keyword selection (Keyword planner),Display Planner,Ad Extensions,Different types of extensions,Creating location extensions,Creating call extensions,Create Review extensions,Ad creation process,Keyword Grouping,Biddingtechniques – Manual / Auto,Site Targeting,Keyword targeting,Demographic Targeting / Bidding,CPC-based, CPA-based & CPM-based accounts.	8
UNIT - IV	Mobile Ads:What is mobile ads?,Creating mobile ads?,What are the types of mobile ads?,AdWords for mobile Click to Call ampaigns:Create click to call campaign,Analyze the campaigns,Optimize the ads for mobile Youtube Advertising:What is youtube advertising?,Why should one advertise on youtube?,Creating youtube campaigns,Choose the audience for video ads,Instream ads,Invideo ads,In-search ads,In-display ads,Measuring your YouTube ad performance,Drive leads and sales from YouTube ads Facebook Marketing:Facebook Paid Marketing,Running paid campaigns,Managing interests,Create custom audiences,Create multiple adverts,Power editorBilling in AdWords:Different types of billing,Postpay and Prepay [Automatic and Manual],Billing issues,Retry card,Troubleshooting issues,Primary card and back up card,Promo codes and working with them.Content Marketing:Blog Marketing,Article Marketing,Cross promotions,How to effectively market content,Call to action via content,Guest blogging,Content Marketing tools (Around 30 of them) Email Marketing:Importance of email marketing,email Marketing platforms,Creating emailers,Tracking emailers,Open rates and CTR of emailers,Drive leads from emailers,What is opt-in lists,Create forms Social Media Marketing:Social Media, Social networking & Social Media Marketing Defined,Blogging and microblogging,Social networking,Video Sharing Social Shopping & Opinions:Social News and Social Bookmarking,Social events,wikis,Social Media Strategy.	8
UNIT - V	Email Marketing:Importance of email marketing,email Marketing platforms,Creating emailers,Tracking emailers,Open rates and CTR of emailers,Drive leads from emailers,What is opt-in lists,Create forms Social Media Marketing:Social Media, Social networking & Social Media Marketing Defined,Blogging and microblogging,Social networking,Video Sharing Social Shopping & Opinions:Social News and Social Bookmarking,Social events,wikis,Social Media Strategy	8

References Books:

1 Big Book of Digital Marketing, Publisher: Digital Firefly Marketing

2 Fifty Shades of Digital Marketing, Francesca James, Hannan Durham

3 Martinez-Rolan, Publisher: Springer International Publishing

3 Internet Marketing, Alex Trengove Jones, Anna Malczyk and Justin Beneke, Publisher: GetSmarter

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Class			**Master of Computer Application (MCA) II YEAR**
Semester/Year			**IV Semester**
Elective Paper			**Elective - III**
Subject & Subject Code			**Information Security (3A) - MCAPL20S407**
Max. Marks			**60 (ETE) + 40 (IA) = 100**
Credit			**Total Credits**
L	**T**	**P**	**4**
3	1	0	

Course Objectives:

Given the knowledge of computer networks, student will be able to understand what are the common threats faced today, what are the foundational theory behind information security, what are the basic principles and techniques when designing a secure system.

Course Outcome:

1. Develop an understanding of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
2. Gain familiarity with prevalent network and distributed system attacks, defenses against them, and forensics to investigate the aftermath.
3. Develop a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
4. Develop an understanding of security policies (such as authentication, integrity and confidentiality), as well as protocols to implement such policies in the form of message exchanges.
5. Determine appropriate mechanisms for protecting information systems ranging from operating systems to database management systems and to applications.

Student Learning Outcomes (SLO):

1.define what information is.
2.appreciate the value of information to the modern organisation
3.understand the CIA triad of Confidentiality, Integrity and Availability
4.appreciate the difficulties that arise when valuable information needs to be shared
5.identify the five leading-edge resources that have up-to-date information on information security.

Unit	Syllabus	Periods
UNIT - I	Introduction : What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC.	8
UNIT - II	Security Investigation : Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues, An Overview of Computer Security, Access Control Matrix, Security Policies, Integrity Policies and Hybrid Policies	8
UNIT - III	Security Analysis : Risk Management : Identifying and accessing Risk, Accessing and Controlling Risk. Systems : Access Control Mechanism, Information Flow and Confinement Problem.	8

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UNIT - IV	Logical Design : Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity.	8
UNIT - V	Physical Design : Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel.	8

References Books:

1. Michael E Whitman and Herbert J Mattord, —Principles of Information Security, Vikas Publishing House, New Delhi, 2003
2. Micki Krause, Harold F. Tipton, — Handbook of Information Security Management, Vol 1-3 CRCPress LLC, 2004.
3. Stuart McClure, Joel Scrambray, George Kurtz, —Hacking Exposed, Tata McGraw- Hill, 2003
4. Matt Bishop, — Computer Security Art and Science, Pearson/PHI, 2002.

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Class			**Master of Computer Application (MCA) II YEAR**
Semester/Year			**IV Semester**
Elective Paper			**Elective - III**
Subject & Subject Code			**Block Chain And Cryptocurrency (3B) - MCAPL20S408**
Max. Marks			**60 (ETE) + 40 (IA) = 100**
Credit			**Total Credits**
L	**T**	**P**	**4**
3	**1**	**0**	

Course Objectives:

1. To provide an overview of the different blockchain technologies.
2. To provide the knowledge on the need of blockchain and its applicability in real world problem.
3. To provide the knowledge of cryptocurrency design and its security against scam ,fraud, hacking.
4. To provide the ability to design and implement new ways of using blockchain for applications other than cryptocurrency.
5. To be able to apply the knowledge gained through the course in actual blockchain development or blockchain contract developer

Course Outcome:

1. Learn and explain the difference between centralized, decentralized network and blockchain.
2. Explain fundamental concepts of blockchain using hashes and consensus.
3. Understand the concept of mining in blockchains.
4. Understand the working of Bitcoin and its security.
5. Know about the different platforms for implementing blockchain and its varied application.

Student Learning Outcomes (SLO):

Students will be able to

1.difference between centralized, decentralized network and blockchain

2.working of Bitcoin and its security.

3.working of Bitcoin and its security.

Unit	Syllabus	Periods
UNIT - I	VERVIEW OF BLOCKCHAIN: Why Blockchain - The Structure of Blockchain - Data Structure of Blockchain - Data Distribution in Blockchain - Block Validation. Block Validators: Proof of Work – Proof of Stake - Proof of Activity - Proof of Elapsed Time - Proof of Burn.	8
UNIT - II	CRYPTOCURRENCY Overview. Bitcoin: Bitcoin Working - Bitcoin Transactions - Bitcoin Mining - Value of Bitcoin - Community, Politics and Regulations – Advantages – Disadvantages. Ethereum: Overview – Decentralized Application. Components of Ethereum: Smart contracts – Ether - Ethereum Clients - Ethereum Virtual Machine – Etherscripter.	8

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UNIT - III	HYPERLEDGER Introduction. Digital Tokens: Overview - Initial Coin Offering – OmiseGO – EOS – Tether.MetaMask: Wallet Seed - MetaMask Transactions. Mist: Overview - Mist wallet. Truffle: Features of Truffle – Development Truffle boxes - Community truffle box.	8
UNIT - IV	SOLIDITY Smart Contracts - Contract and Interfaces - Hyperledger Fabric: Introduction - Fabric v/s Ethereum - HyperledgerIroha - Features of Iroha. HyperledgerSawtooth: Components of sawtooth - Proof of Elapsed time.	8
UNIT - V	BLOCKCHAIN PLATFORMS Multichain - HydraChain. Future Blockchain: IOTA – Corda - Chain Core.Blockchain Framework: CoCo Framework – Tierion – BigchainDB	8

References Books:

1 Josh Thompson, 'Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology and Blockchain Programming', Create Space Independent Publishing Platform, 2017.

2 Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press, 2016.

3 . Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and cryptocurrency, IEEE Symposium on security and Privacy, 2015.

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EKLAVYA UNIVERSITY
ज्ञान प्राप्तये लक्ष्य संधानम्

School of Basic & Applied Sciences

Class			**Master of Computer Application (MCA) II YEAR**
Semester/Year			**IV Semester**
Elective Paper			**Elective - III**
Subject & Subject Code			**Mobile Computing (3C) - MCAPL20S409**
Max. Marks			**60 (ETE) + 40 (IA) = 100**
Credit			**Total Credits**
L	**T**	**P**	**4**
3	**1**	**0**	

Course Objectives:

1.Understand basic mobile network concepts and its architectures.
2. Know Protocols like mobile telephony and introduce to the concepts of bluetooth
3. Comprehend the GSM architectures and its features that support mobile communications.
4. Understand the network management and Middleware services used in Ip and Mobile telephony
5. Get accustomed to the concepts like GPRS, 3G, 4G networks

Course Outcome:

1. Identify the role of cellular networks in Mobile and Pervasive Computing
2 Analyse about the basic architecture for a pervasive computing environment
3 Assess the principles for routing and allocating the resources on the 3G-4G wireless network
4 Evaluate mobile computing applications based on the paradigm of context aware computing
5 Design and develop applications in mobile and pervasive computing environment

Student Learning Outcomes (SLO):

1. A working understanding of the characteristics and limitations of mobile hardware devices including their user-interface modalities
2. The ability to develop applications that are mobile-device specific and demonstrate current practice in mobile computing contexts.
3. A comprehension and appreciation of the design and development of context-aware solutions for mobile devices.
4. An awareness of professional and ethical issues, in particular those relating to security and privacy of user data and user behaviour.

Unit	Syllabus	Periods
UNIT - I	WIRELESS COMMUNICATION FUNDAMENTALS Introduction to Mobile Computing- Mobile Computing V/S Wireless Computing –Mobile Computing Applications- Characteristics of Mobile Computing- Structure of Mobile Computing Applications. Generations of Mobile Communication Technologies- Multiplexing – Spread spectrum- MAC Protocols –SDMA- TDMA- FDMA- CDMA	8
UNIT - II	: TELECOMMUNICATION SYSTEMS Introduction to Cellular Systems-GSM – System Architecture – Protocols – Connection Establishment – Frequency Allocation Routing – Mobility Management – Security – GPRSArchitecture - Handover.	8

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UNIT - III	MOBILE NETWORK LAYER Mobile IP – DHCP – Proactive protocol-DSDV, Reactive Routing Protocols – DSR, AODV , Hybrid routing –ZRP, Wireless LAN – IEEE 802.11 Standards –Architecture – services – HIPERLAN – Ad- Hoc Network – Blue Tooth,Explain Type of layer.	8
UNIT - IV	: Mobile AD-HOC Networks9 AD- HOC Basics Basic Concepts – Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols –Popular Routing Protocols – Vehicular Ad Hoc networks (VANET) – MANET Vs VANET – Security And protection.	8
UNIT - V	MOBILE PLATFORMS AND APPLICATIONS 9 Mobile Device Operating Systems – Special Constrains & Requirements – Commercial Mobile Operating Systems – Software Development Kit: Ios, Android, BlackBerry, Windows Phone – M Commerce – Structure – Pros & Cons – Mobile Payment System – Security Issues.	8

References Books:

1 Jochen Schiller, "Mobile Communications", Second Edition, Prentice Hall of India / Pearson Education, 2003.

2 . William Stallings, "Wireless Communications and Networks",SecondEdition, Prentice Hall of India / Pearson Education, 2004.

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School of Basic & Applied Sciences

Class			**MASTER OF COMPUTER APPLICATION (MCA)**
Semester/Year			**Semester - IV**
Subject & Subject Code			**Computer- Lab – MCAPL20S411**
Max. Marks			**60 (ETA) + 40 (IA) = 100**
Credit			**Total Credits**
L	**T**	**P**	**5**
0	**0**	**5**	

LIST OF PRACTICAL (Advanced Python)

a. Write a program to count the numbers of characters in the string and store them in a dictionary data structure.

b. Write a program to use split and join methods in the string and trace a birthday with a dictionary data structure.

c. Write a program combine_lists that combines these lists into a dictionary.

d. Write a Python program to find shortest list of values with the keys in a given dictionary.

e. Write a program to read a 3 X 3 matrix and find the transpose.

f. Write a program to perform addition, subtraction of two 3 X 3 matrices.

g. Write a program to perform multiplication of two 3 X 3 matrices.

h. Write a program to check whether two given 3 X 3 matrices are identical or not.

i. Install packages requests, flask and explore using (pip)

j. Write a Python program that imports requests and fetch content from wiki page.

k. Write a Python program to generate a series of unique random numbers by using random module

l. Write a Python program to find the substrings within a string using re module.

LIST OF PRACTICAL (Advanced Web Technology)

1. Write a Java script to prompt for users name and display it on the screen.
2. Design HTML form for keeping student record and validateit using Java script.
3. Write an HTML program to design an entry form of student details and send itto store at database server like SQL Oracle or MS Access.
4. Write a JavaScript program to display the current day and time in the following format.
   Sample Output : Today is : Tuesday.
   Current time is : 10 PM : 30 : 38
5. Write a JavaScript program to print the contents of the current window.
6. Write a JavaScript program to find the area of a triangle where lengths of the three of its sides are 5, 6, 7.
7. Write a JavaScript program to calculate multiplication and division of two numbers (input from user).
8. Which jQuery function(s) allow you to manipulate style rules of an element or set of elements?
9. What is the difference between the jQuery functions text() and html() ?
10. Which jQuery function(s) allow you to manipulate the visibility of elements?

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School of Basic & Applied Sciences

LIST OF PRACTICAL (Mobile Computing)

1. Installing android Environment
2. Create "Hello World" Application. That Will Display "Hello World" in the Middle of the Screen in the Emulator. Also Display "Hello World" in the Middle of the Screen in the android Phone.
3. Create an Application with Login Module. (Check Username and Password).
4. Create Spinner with Strings Taken from Resource Folder (Res >> Value Folder) and On Changing the Spinner Value Image Will Change.
5. Create a Menu with 5 Options and Selected Option Should Appear in Text Box.
6. Create a List of All Courses in Your College and On Selecting a Particular Course Teacherin-Charge of That Course Should Appear At the Bottom of the Screen.
7. Create an Application with Three Option Buttons On Selecting a Button Color of the Screen Will Change.
8. Create and Login Application as Above. On Successful Login Pop Up the Message.
9. Create an Application to Create Insert Update Delete and Retrieve Operation On the Database.
10. Create a Simple Application Using android Resources.
11. Create a Simple Application Using Layouts.
12. Create a Simple Application Using Intents.
13. Create a Simple Application Using User Interfaces.
14. Create a Simple Application for Playing Audio and Video Files.
15. Create a Simple Application Using Database Connectivity with Sqlite Database..

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