Seva Mandal Education Society's

Smt. Kamlaben Gambhirchand Shah Department of Computer Applications

under

Dr. Bhanuben Mahendra Nanavati College of Home Science (Autonomous)

NAAC Re-Accredited 'A+' Grade with CGPA 3.69 / 4
UGC Status: College with Potential for Excellence
'Best College Award 2016-17' adjudged by S.N.D.T. Women's University
Smt. Parmeshwari Devi Gordhandas Garodia Educational Complex
338, R.A. Kidwai Road, Matunga, Mumbai - 400019. Tel: 24095792 Email:
smesedu@gmail.com

APPROVED SYLLABUS UNDER AUTONOMY

PROGRAMME: MASTER OF SCIENCE (COMPUTER SCIENCE)

DEPARTMENT OF COMPUTER APPLICATIONS SEMESTER – III (2020-21)

PROGRAM OBJECTIVES

This program will enable the students to:

1. Gain in-depth knowledge in the key areas of computer science and practice in emerging, cutting edge Computational Technologies.
2. Develop software solutions to real world problems through Information Technological skills with international standards and facilitate them to be outstanding professionals.
3. Contribute to scientific research by independently designing, conducting and presenting the results of small-scale research.
4. Be a part of skilled manpower in the various areas of computer science such as Algorithm Analysis and Design, Data warehousing and Mining, Software Engineering, Advanced Computing technologies, Web-based Applications Development, and Data Science.

PROGRAM OUTCOME

The completion of the post-graduation programme:

1. Takes forward the knowledge gained by the students at the undergraduate level and provides them with an advanced level of learning and understanding of the subject.

2. Provides students with higher educational degree of technical skills in problem solving and application development.

3. Helps students to acquire an analytical and managerial skills to enhance employment potential.

Program Specific Outcome

1. The main outcome of this programme is enhancement in the Technical and Analytical skills of computer science enthusiasts and provide them with the perfect amalgamation of theory as well as practical knowledge in the various thrust areas of the field.

2. The students will acquire broad knowledge in core areas of computer science, current and emerging computing technologies.

3. The students also acquire a research oriented professional approach to provide sustainable solution to real life problems which can be solved using computational technologies.

Eligibility

- A Science Graduates in
    - BSc. (Physics),
    - BSc. (Maths.),
    - BSc (Elect.),
    - BSc. (IT),
    - B.Sc. (CS) or
    - BCA or
    - any engineering graduate in allied subject from the recognized university

    with an aggregate mark not less than 50% (Open Category) and 45% (Reserved category).

- Mathematics at 12th Level or 100 marks mathematics studied at graduation level is minimum requirement.

M.Sc. (COMPUTER SCIENCE) SEMESTER - III (SECOND YEAR)

Code	Subject Title	Teaching Period / Week		Credit			Duration of Theory Exam (in Hrs.)
		L	Pr./Tu	Int.	Ext.	Total	
MCS301	Big Data Analytics and Machine Learning	4	-	2	2	4	2
MCS302	Artificial Intelligence	4	-	2	2	4	2
MCS303	Mobile Application Development	4	-	2	2	4	2
MCS304	Information and Cyber Security	4	-	2	2	4	2
MCSL305	Big Data Analytics Lab	-	2	1	1	2	1
MCSL306	Machine Learning Lab	-	2	1	1	2	1
MCSL307	Mobile Application Development Lab	-	2	1	1	2	1
MCSL308	Ethical Hacking Lab	-	2	1	1	2	1
	Total	**16**	**8**			**24**	**-**

SEMESTER-III	**1 Credit=25 Marks** **Total Credits = 24** **Total Marks = 24*25=600**

COURSE: BIG DATA ANALYTICS AND MACHINE LEARNING

CREDIT - 04

Objectives:
- To study the basic of Hadoop
- To study the basic of Map-Reduce
- To study the basic of NoSQL, Hive, Pig,
- To study the basic of Machine Learning

Outcomes:
The course will help:
- To understand and learn Hadoop, Map-Reduce, NoSQL
- To understand and learn Hive, Pig, Machine Learning

Code	Course	Teaching Period / Week	Credit	Duration of Theory

		L	Pr./Tu	Int.	Ext.	Total	Exam (in Hrs.)
MCS301	**Big Data Analytics and Machine Learning**	4	-	2	2	4	2

Module No.	Objective	Content	Evaluation
1	To introduce student to the concept of big Data, Statistical and Soft Computing Analysis of Big Data.	**Introduction to Big Data** Big data: Introduction to Big data Platform, Traits of big data, Challenges of conventional systems, Web data, Analytic processes and tools, Analysis vs Reporting, Modern data analytic tools, Statistical concepts: Sampling distributions, Re-sampling, Statistical Inference, Prediction error. Data Analysis: Regression modeling, Analysis of time Series: Linear systems analysis, Nonlinear dynamics, Rule induction, Neural networks: Learning and Generalization, Competitive Learning, Principal Component Analysis and Neural Networks, Fuzzy Logic: Extracting Fuzzy Models from Data, Fuzzy Decision Trees, Stochastic Search Methods.	Unit Test-1 (Marks-25)
2	To introduce students with Map-Reduce based computing environment used for Big Data Analysis	**MAP REDUCE** Introduction to Map Reduce: The map tasks, grouping by key, the reduce tasks, Combiners, Details of MapReduce Execution, Coping with node failures. Algorithms Using MapReduce: Matrix-Vector Multiplication, Computing Selections and Projections, Union, Intersection, and Difference, Natural Join. Extensions to MapReduce: Workflow Systems, Recursive extensions to MapReduce, Common map reduce algorithms.	Oral Presentation (Marks 10)
3	To demonstrate standard linear methods used in Machine Learning	**Machine Learning- Standard Linear methods** Statistical Learning, Assessing Model Accuracy. Linear Regression: Simple Linear Regression, Multiple Linear Regressions, Other Considerations in the Regression Model, The Marketing Plan, Comparison of Linear Regression with K-Nearest Neighbors. Classification: An Overview of Classification, Why Not Linear Regression, Logistic Regression, Linear Discriminant Analysis, A Comparison of Classification Methods.	Class Test (Marks 10)
4	To demonstrate standard non-linear methods used in Machine Learning	**Machine Learning- Non-Linear Learning methods** Polynomial Regression, Step Functions, Basis Functions, Regression Splines, Smoothing Splines, Local Regression, Generalized Additive Models, Tree-Based Methods: The Basics of Decision Trees. Bagging, Random Forests, Boosting., Support Vector machines, Principle Component Analysis and Clustering	Assignment (Marks 05)

EVALUATION:
1)   On Four Modules of 50 marks
2)   Final examination of 50 marks

3)   Total marks   = Internal 50 + External 50 = 100

TEXT BOOKS:

1. Anand Rajaraman and Jeffrey David Ullman, *Mining of Massive Datasets*, Cambridge University Press, 2012.
2. Michael Minelli, (2013), *Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses*, Wiley

REFERENCE BOOKS:

1. J. Hurwitz, et al., (2013), *Big Data for Dummies*, Wiley
2. Paul C. Zikopoulos, Chris Eaton, Dirk deRoos, Thomas Deutsch, George Lapis, (2012), *Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data*, McGraw-Hill
3. James Manyika , Michael Chui, Brad Brown, Jacques Bughin, Richard Dobbs, Charles Roxburgh, Angela Hung Byers, (2011), *Big data: The next frontier for innovation, competition, and productivity*, McKinsey Global Institute
4. Pete Warden, (2011), *Big Data Glossary*, O'Reilly
5. David Loshin, (2013), *Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph,* Morgan Kaufmann Publishers
6. Kevin P Murphy, (2012), *Machine Learning: A Probabilistic Perspective:* The MIT Press Cambridge
7. Ethem Alpaydın, (2015), *Introduction to Machine Learning* (Third Edition): The MIT Press
8. Christopher M. Bishop, (2006) *Pattern Recognition and Machine Learning*: Springer
9. Peter Harrington, (2012), *Machine Learning in Action*: Manning Publications
10. Brett Lantz, (2013), Machine *Learning with R:* Packt Publishing

_____

—

COURSE: ARTIFICIAL INTELLIGENCE

CREDIT - 4

Objectives:

- To Understand various Artificial Intelligence concepts
- To enable the students to identify and describe problems that are open to be solved by AI methods

Outcomes:

The students will be able to:

- Understand various problems which will be solvable by using Artificial Intelligence concepts
- Learn to write programs using Artificial Intelligence programming languages (LISP and PROLOG)

Code	Course	Teaching Period / Week		Credit			Duration of Theory Exam (in Hrs.)
		L	Pr./ Tu	Int.	Ext.	Total	
MCS302	**Artificial Intelligence**	4	-	2	2	4	2

Module No.	Objective	Content	Evaluation
1	To learn the concepts of AI	**Introduction to Artificial Intelligence** **Introduction:** Concepts & definitions of AI, Brief history of AI, State space search: Generate and test, Simple search, Depth First Search (DFS), Breadth First Search (DFS), Comparison and quality of solutions. Best First Search (BFS), Hill Climbing, A* algorithm.	Written Unit Test – I (Marks 25)
2	To study propositional logic and first order predicate logic and use the technique to solve logical reasoning problems. To develop and use fuzzy arithmetic tools in solving problems	**Knowledge Representation** Propositional and Predicate Logic: Syntax and semantics for prepositional logic (PL) and first order propositional logic (FOPL), Properties of well-formed formula (wff), Inference rules. First Order Predicate Logic: Syntax of Predicate Logic, Prenex Normal Form (PNF), (Skolem) Standard Form, Applications of FOPL. Deductive Inference Rules and Methods: Basic Inference Rules and Application in PL, Basic Inference Rules and Application in FOPL, Resolution Method in PL and FOPL. Fuzzy Logic: Fuzzy Sets, Fuzzy Operators & Arithmetic, Membership Functions, Fuzzy Relations.	Assignments will be given for the above topics. (Marks 5)
3	To learn to write programs using the syntax of AI programming languages (LISP and PROLOG)	**AI Programming Languages & Applications of AI** AI Programming Languages: Introduction to LISP, Syntax and Numeric Functions, Basic List Manipulation Functions in LISP Functions, Predicates and Conditionals, Input, Output, and Local Variables, Iteration and Recursion, Property Lists and Arrays, PROLOG: List, Operators, Arithmetic, Cut and Fail operator, Backtracking.	Assignments will be given for the above topics. (Marks 5)
4	To make a detailed study of Expert System	**Expert Systems:** Introduction and Concept of Planning, Representing and Using Domain Knowledge Expert System Shells, Knowledge Acquisition. Intelligent Agents: Agents and environments, Rationality and other performance measures, Nature of environments, Structure of agents.	Online Class test will be conducted. (Marks 15)

EVALUATION:

1) On Four Modules of 50 marks
2) Final examination of 50 marks
3) Total marks = Internal 50 + External 50 = 100

TEXT BOOK:

1) Deepak Khemani, (2013), *A First course in Artificial Intelligence*, Tata McGraw Hill Education (India) private limited
2) Ben Coppin, Jones, (2004), *Artificial Intelligence Illuminated*, Bartlett Publishers Inc.

REFERENCE BOOKS:

1) Stuart Jonathan Russell, Peter Norvig, (2010), *Artificial Intelligence: A Modern Approach*, 3e, Prentice Hall Publications.
2) M Tim Jones (2008), *Artificial Intelligence A Systems Approach*, Firewall media, New Delhi
3) George Lugar, (2002), *Artificial Intelligence -Structures and Strategies for Complex Problem Solving*., 4/e, Pearson Education

_____

___

COURSE: MOBILE APPLICATION DEVELOPMENT

CREDIT - 04

Objectives:
- To Understand the entire Android Apps Development Cycle
- To Apply the advanced android development techniques
- To Conceptualize the design of user applications using User Experience Design.

Outcomes:
The students will be able to:
- Demonstrate Android activities life cycle
- Apply proficiency in coding on a mobile programming platform.
- Design and develop innovative android applications
- Create real life application with end-to-end understanding of User experience practices

Code	Course	Teaching Period / Week		Credit			Duration of Theory Exam (in Hrs.)
		L	**Pr./ Tu**	**Int.**	**Ext.**	**Total**	
MCS303	**Mobile Application Development**	**4**	**-**	**2**	**2**	**4**	**2**

Module No.	Objective	Content	Evaluation

1	To identify android platform features	**Introduction to Android** The android platform, the layers of android, Four kinds of android components, understanding the androidManifest.xml file, creating an android application	Unit Test-1 (Marks-25)
2	To introduce UI and data operations	**User Interface, Storing and Retrieving data** Creating the activity, working with views, using resources Working with intents and services, Using the file system, working with shared preferences,	Oral Presentation (Marks 10)
3	To integrate android platform with API	**Location Sensors and REST API Integration** Using Location Manager and Location Provider, working with maps, Working with GPS, Bluetooth and WiFi, Integrating google maps, services for push notificationGoogleads, UsingAsyncTask to perform network operations, introduction to HtttpUrlConnection and JSON, performing network operations asynchronously, working with OkHttp, Retrofit and Volley	Class Test (Marks 10)
4	To learn database connectivity in android application	**Database connectivity and distributing android application** SQLite Programming, Android database connectivity using SQLite, distribution options, packaging and testing the application, distributing applications on google play store	Assignment (Marks 05)

EVALUATION:
1)   On Four Modules of 50 marks
2)   Final examination of 50 marks
3)   Total marks = Internal 50 + External 50 = 100

TEXT BOOKS:

1)   W. Frank Ableson, Robi Sen, Chris King, C. Enrique Ortiz, *Android in action*, Third Edition, Dreamtech Press.

REFERENCE BOOKS
1)   Wei-Meng Lee, *Beginning Android 4 Application Development,* Wrox Publications
2)   Helllo, *Android Introducing Google's Mobile Development Platform*, Fourth Edition, Ed Burnette, SPD Publications.

COURSE: INFORMATION AND CYBER SECURITY

CREDIT - 04

Objectives:
•   To develop an understanding of information security as practiced in computer operating systems, distributed systems, networks and representative applications.

- To gain familiarity with prevalent network and distributed system attacks, and defences against them.
- To develop a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
- To 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.

Outcomes:

The students will be able to gain:
- Knowledge about the technical and legal terms relating to the cybersecurity, cyber offences and crimes.
- Gain an insight to the Indian Act 2000 and the organizational implications of cyber Security

Code	Course	Teaching Period / Week		Credit			Duration of Theory Exam (in Hrs.)
		L	Pr./ Tu	Int.	Ext.	Total	
MCS304	Information and Cyber Security	4	-	2	2	4	2

Module No.	Objective	Content	Evaluation
1	To introduce student to different types of computer security attack and ethical hacking	**Computer Security** Principles of Security, Different Attacks: malicious and non-malicious program, Types of Computer Criminals. Operating System Security: Protected objects and methods of protection. Memory address protection: Fence, Relocation, Base/Bound Registers, Tagged Architecture, Segmentation, Paging, Directory, access control list. Database Security: Security requirements, Integrity, Confidentiality, Availability, Reliability of Database, Sensitive data, Multilevel database, Proposals for multilevel security. Introduction to Ethical Hacking	Students will be evaluated by taking viva. (Marks 05)
2	To elaborate the concept of Authentication, Internet Security, network security and Kerberos	**Network Security** Different types of network layer attacks, Firewall (ACL, Packet Filtering, DMZ, Alerts and Audit Trials) – IDS, IPS and its types (Signature based, Anomaly based, Policy based, Honeypot based). Web Server Security: SSL/TLS Basic Protocol-computing the keys- client authentication-PKI as deployed by SSL Attacks fixed in v3-Exportability-Encoding-Secure Electronic Transaction (SET), Kerberos, Secret Key Cryptography, public key cryptography, Hash function and message digest	Written Unit Test – I (Marks 25)

3	To elaborate cloud data security	**Cloud Security** How concepts of Security apply in the cloud, User authentication in the cloud; How the cloud provider can provide this- Virtualization System Security Issues: e.g. ESX and ESXi Security, ESX file system security- storage considerations, backup and recovery- Virtualization System Vulnerabilities, security management standards- SaaS, PaaS, IaaS availability management- access control- Data security and storage in cloud.	Written Class Test will be conducted. (Marks 10)
4	To demonstrate wireless communication security	**Mobile Security** Mobile system architectures, Overview of mobile cellular systems, GSM and UMTS Security & Attacks, Vulnerabilities in Cellular Services, Cellular Jamming Attacks & Mitigation, Security in Cellular VoIP Services, Mobile application security. Securing Wireless Networks: Overview of Wireless Networks, Scanning and Enumerating 802.11 Networks, Attacking 802.11 Networks, Bluetooth Scanning and Reconnaissance, Bluetooth Eavesdropping, Attacking & Exploiting Bluetooth, Zigbee Security & Attacks.	Assignments will be given for the above topics. (Marks 10)

EVALUATION:
1) On Four Modules of 50 marks
2) Final examination of 50 marks
3) Total marks   = Internal 50 + External 50 = 100

TEXT BOOKS:
1) Charles P. Pfleeger, Charles P. Pfleeger, Shari Lawrence Pfleeger, (2006), *Security in Computing* 4th edition, Prentice Hall; 4th edition
2) Kia Makki, Peter Reiher, (2007), *Mobile and Wireless Security and Privacy,* Springer

REFERENCE BOOKS:

1) Tim Mather, Subra Kumaraswamy, Shahed Latif., (2009), *Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance (Theory and practice),* O'Reilly Media; 1 edition
2) Ronald L. Krutz, Russell Dean Vines, (2010), Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley
3) Charlie Kaufman, Radia Perlam, Mike Speciner, (2010), *Network Security*, Prentice Hall, 2nd Edition
4) Atul Kahate, (2013), *Cryptography and Network Security* 3rd edition, Tata McGraw Hill Education Private Limited
5) William Stallings, (2013), *Cryptography and Network Security: Principles and practice* 6th edition, Pearson Education

_____
____

COURSE: BIG DATA ANALYTICS LAB

CREDIT: 2

Objectives:
- To enable the students to gain practical knowledge about Hadoop, Map-Reduce
- To enable the students to gain practical knowledge about NoSQL, Hive, Pig

Outcomes:
The students will be able to:
- Understand various problem-solving methods using Big Data Analytics techniques
- Learn the map-reduce based programming techniques

Code	Course	Teaching Period / Week		Credit			Duration of Theory Exam (in Hrs.)
		L	Pr./Tu	Int.	Ext.	Total	
MCSL305	**Big Data Analytics Lab**	-	2	1	1	2	1

Module No	Objective	Content	Evaluation
1	To demonstrate use of Map-Reduce based framework to analyse letters in large text	**Occurrences of Letter** Implement Hadoop system, Map-reduce program to count the number of occurrences of each alphabetic character in the given dataset. The count for each letter should be case-insensitive (i.e., include both upper-case and lower-case versions of the letter; Ignore non-alphabetic characters).	Students will be evaluated using Lab Manual. (Marks 5)
2	To demonstrate use of Map-Reduce based framework to analyse words in large text	**Occurrences of Words** Map-reduce program to count the number of occurrences of each word in the given dataset. (A word is defined as any string of alphabetic characters appearing between non-alphabetic characters like nature's is two words. The count should be case-insensitive. If a word occurs multiple times in a line, all should be counted)	Class Test (Marks 10)
3	To implement Pig system	**Implementation of Pig System** Pig installation, Load Data in Pig from Local Environment and Query the Data	Practical Exam will be conducted. (Marks 10)
4	To implement Hive System	**Implementation of Hive System** Hive queries, Hive Storage and HDFS	
The experiments may be done using software/tools like Hadoop / WEKA / R / Java etc.			

EVALUATION:
1) On Four Modules of 25 marks
2) Final examination of 25 markss
3) Total marks = Internal 25 + External 25 = 50

TEXT BOOKS:

1. Anand Rajaraman and Jeffrey David Ullman, *Mining of Massive Datasets*, Cambridge University Press, 2012.
2. Michael Minelli, (2013), *Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses*, Wiley

REFERENCE BOOKS:

1. J. Hurwitz, et al., (2013), *Big Data for Dummies*, Wiley
2. Paul C. Zikopoulos, Chris Eaton, Dirk deRoos, Thomas Deutsch, George Lapis, (2012), *Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data*, McGraw-Hill
3. James Manyika , Michael Chui, Brad Brown, Jacques Bughin, Richard Dobbs, Charles Roxburgh, Angela Hung Byers, (2011), *Big data: The next frontier for innovation, competition, and productivity*, McKinsey Global Institute
4. Pete Warden, (2011), *Big Data Glossary*, O'Reilly
5. David Loshin, (2013), *Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph,* Morgan Kaufmann Publishers
6. Kevin P Murphy, (2012), *Machine Learning: A Probabilistic Perspective:* The MIT Press Cambridge
7. Ethem Alpaydın, (2015), *Introduction to Machine Learning* (Third Edition): The MIT Press
8. Christopher M. Bishop, (2006) *Pattern Recognition and Machine Learning*: Springer
9. Peter Harrington, (2012), *Machine Learning in Action*: Manning Publications
10. Brett Lantz,(2013), *Machine Learning with R:* Packt Publishing

_____

COURSE: MACHINE LEARNING LAB

CREDIT: 2

Objectives:
- To enable the students to gain practical knowledge about algorithms of linear methods in Machine Learning
- To enable the students to gain practical knowledge about algorithms of non-linear methods in Machine Learning

Outcomes:
The students will be able to:
- Understand various problem-solving methods machine learning techniques
- Learn in depth linear and non-linear methods of machine learning

Code	Course	Teaching Period / Week	Credit	Duration of Theory

		L	Pr./ Tu	Int.	Ext.	Total	Exam (in Hrs.)
MCSL306	Machine Learning Lab	-	2	1	1	2	1

Module No	Objective	Content	Evaluation
1	To demonstrate standard linear methods (regression) used in Machine Learning	**Standard Linear methods - Regression** Practical sessions on Statistical Learning, Assessing Model Accuracy. Linear Regression: Simple Linear Regression, Multiple Linear Regressions, Other Considerations in the Regression Model, The Marketing Plan, Comparison of Linear Regression with K-Nearest Neighbors.	Students will be evaluated using Lab Manual. (Marks 5)
2	To demonstrate standard linear methods (classification) used in Machine Learning	**Standard Linear methods - Classification** Practical Sessions on Classification: Logistic Regression, Linear Discriminant Analysis, A Comparison of Classification Methods performance.	Class Test (Marks 10)
3	To demonstrate standard non-linear tree-based methods used in Machine Learning	**Non-Linear Learning methods - Tree-Based Methods** Practical sessions on Polynomial Regression, Step Functions, Basis Functions, Regression Splines, Smoothing Splines, Local Regression, Generalized Additive Models, Tree-Based Methods: The Basics of Decision Trees. Bagging, Random Forests, Boosting	Practical Exam will be conducted. (Marks 10)
4	To demonstrate standard non-linear SVM, PCA methods used in Machine Learning	**Non-Linear Learning methods - SVM** Practical sessions on Support Vector machines, Principle Component Analysis and Clustering	
The experiments may be done using software/tools like Hadoop / WEKA / R / Java etc.			

EVALUATION:
1) On Four Modules of 25 marks
2) Final examination of 25 marks
3) Total marks   = Internal 25 + External 25 = 50

TEXT BOOKS:

1. David Loshin, (2013), *Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph,* Morgan Kaufmann Publishers
2. Kevin P Murphy, (2012), *Machine Learning: A Probabilistic Perspective:* The MIT Press Cambridge

REFERENCE BOOKS:

1. Pete Warden, (2011), *Big Data Glossary*, O'Reilly

2. Ethem Alpaydın, (2015), *Introduction to Machine Learning* (Third Edition): The MIT Press
3. Christopher M. Bishop, (2006) *Pattern Recognition and Machine Learning*: Springer
4. Peter Harrington, (2012), *Machine Learning in Action*: Manning Publications
5. Brett Lantz,(2013), *Machine Learning with R:* Packt Publishing

COURSE: MOBILE APPLICATION DEVELOPMENT LAB

CREDIT: 2

Objectives:
- To Understand the entire Android Apps Development Cycle
- To Apply the advanced android development techniques
- To Conceptualize the design of user applications using User Experience Design.

Outcomes:
The students will be able to:
- Demonstrate Android activities life cycle
- Apply proficiency in coding on a mobile programming platform.
- Design and develop innovative android applications
- Create real life application with end-to-end understanding of User experience practices

Code	Course	Teaching Period / Week		Credit			Duration of Theory Exam (in Hrs.)
		L	Pr./ Tu	Int.	Ext.	Total	
MCSL307	**Mobile Application Development Lab**	-	2	1	1	2	1

Module No	Objective	Content	Evaluation
1	To demonstrate the basic components and event handling of an Android application.	**Android Platform** Introduction to the Android platform and the Android Studio IDE, Android components, Activities, User Interface Design, Intents, Activity lifecycle, UI Design: Widgets and Layouts, UI Events, Event Listeners	Students will be evaluated using Lab Manual. (Marks 5)
2	To describe the basics of graphics and multimedia support in Android. To demonstrate basic skills of using an Android SDK for implementing Android applications.	**Graphics Support in Android** Drawables, Basics of Material Design, 2D graphics: Canvas/Drawing using a view, multimedia in Android: Audio playback and MediaPlayer, SoundPool	Class Test (Marks 10)

3	To demonstrate skills of using networking concepts in Android	**Networking support** Basics of networking in Android, AsyncTask, HttpURL Connection	Practical Exam will be conducted. (Marks 10)
4	To demonstrate use of database connectivity in Android	**Database connectivity and distributing and android application** SQLite Programming, Android database connectivity using SQLite, distribution options, packaging and testing the application, distributing applications on google play store	

EVALUATION:
1) On Four Modules of 25 marks
2) Final examination of 25 marks
3) Total marks = Internal 25 + External 25 = 50

TEXT BOOKS:

1) W. Frank Ableson, Robi Sen, Chris King, C. Enrique Ortiz, *Android in action*, Third Edition, Dreamtech Press.

REFERENCE BOOKS:

1) Wei-Meng Lee, *Beginning Android 4 Application Development,* Wrox Publications
2) Helllo, *Android Introducing Google's Mobile Development Platform*, Fourth Edition, Ed Burnette, SPD Publications

_____

—

COURSE: ETHICAL HACKING LAB

CREDIT: 2

Objectives:
*   To acquire hands-on working skill set which includes Vulnerability Assessment, Network Infrastructure, Network Securities, Network Exploitation, Red Hat Linux Security.

Outcomes:
The students will be able to:
*   Demonstrate ethical hacking techniques
*   Learn security of sensitive data and websites

Code	Course	Teaching Period / Week		Credit			Duration of Theory Exam (in Hrs.)
		L	Pr./Tu	Int.	Ext.	Total	

MCSL308	Ethical Hacking Lab	-	2	1	1	2	1

Module No	Objective	Content	Evaluation
1	To learn Footprinting concept	**Introduction** Introduction to Ethical Hacking, Foot printing, Surveying & Gathering Data, Understanding IP & MAC addresses., concepts of TCP/IP, Basic networking concepts, Understanding domain registrations & Webhosting concepts	Students will be evaluated using Lab Manual. (Marks 5)
2	To learn scanning of network	**Scanning Network** Overview of Network Scanning, CEH Scanning Methodology, Check for Live Systems, ICMP Scanning, Ping Sweep Tools, Check for Open Ports, Network scanning, Network Pentesting, Viruses, worms & Trojans, Ethical hacking Methods (Key loggers, phishing, RAT)	Class Test (Marks 10)
3	To learn methods of password security	**Password Security** Passwords Cracking, Hacking through Social Engineering, Cryptography, Steganography	Practical Exam will be conducted. (Marks 10)
4	To learn the concept of Denial of Service attack	**Denial of Service attack** SQL Injections, Denial of Service, Cross-site scripting (XSS), Firewalls configurations & Bypassing	

EVALUATION:
1) On Four Modules of 25 marks
2) Final examination of 25 marks
3) Total marks = Internal 25 + External 25 = 50

TEXT BOOKS:
1) Shekhar Mishra, (2017), *Ethical Hacking for Beginners 2019: Complete step by step Guide Beginner to Advance,* PHI

REFERENCE BOOKS:
1) Patrick Engebretson, (2015), The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy, Syngress Basics Series
2) James Clark (2017), *Geek Collection 7 in 1 Box Set: Computer Hacking Guide for Beginners, SQL, Google Drive, Project Management, Amazon FBA, LINUX, Excel,* TMH

■■■