



Name of the school: Faculty of Computer Technology
GLS (S. R. Parikh) Institute of Computer Technology (MCA)
Effective from the year 2016-17
Course Structure
MCA SEM IV

Sr. No	Subject Code	Subjects	Subject Credit
1	0701401	Fundamentals of Networking	4
2	0701402	Soft skills	4
3	0701403	Management Information System	4
4	0703404	Group A, Elective I - Data ware housing and Data mining	4
	0703405	Group A, Elective I - Mobile application development using Android	4
	0703406	Group A, Elective I - Introduction to Python	4
5	0703407	Group B, Elective I – Mobile Communication	4
	0703408	Group B, Elective I – Business analysis	4
	0703409	Group B, Elective I – Operation Research	4
6	0701410	Practical based on 0701401 (FON)	2
7	0703411	Practical based on 0703404 (DWDM)	3
	0703412	Practical based on 0703405 (Android)	3
	0703413	Practical based on 0703406 (Python)	3

List of Electives for Semester IV

Sr. No	Group A Electives	Sr. No	Group B Electives
1	Data ware housing and Data mining	1	Mobile Communication
2	Mobile application development using Android	2	Business analysis
3	Introduction to Python Programming	3	Operation research

MCA
Year - II (Semester - IV)
0701401 Fundamentals of Networking (FON) Subject

Objectives:

- **Find the need for dividing network into layers**
- **List and explain functioning of each layer**
- **Relate real world problems and solutions in network context**

Prerequisites:

Data structures, OS, programming

Course Contents:

Unit No.	Title	Weightage
1	Introduction to Computer Networks Need to share resources, Concepts of Layering, Distributed System and Networks, Prerequisites, Definition, Categories and Components, Applications Data Communication Fundamentals- Introduction, Frequency and Band,	20
2	Physical and Data Link Layer Introduction, Duties of Physical Layer, EM Spectrum, Wired Physical Layer, Wireless Physical Layer Duties of Data Link Layer, The Error	20
3	MAC and Network layer Introduction, Wired MAC Layer, The LLC Layer, Wireless MAC, The MAC Layer, The Generic Frame Structure, Connecting Device at Data Link Layer Introduction, Duties of Network Layer, Connection Oriented and Connectionless Forwarding, Forwarding Examples, Routing Algorithms	20
4	Transport and Application Layer Introduction, Duties of Transport Layer Connection Management at Transport Layer, Introduction, Domain Name System: Name Space, Registration Process, Name Servers, Resource Records, Types of Resource Records, Dynamic DNS	20
5	SDN and IOT SDN, Connection overlays, Separation of Data and Control, OpenFlow, Extensions and additions, Sensing, Monitoring and Control, Communication, Mesh network and smart grids, Zigbee routing	20

Text Book (Theory):

1. Bhushan H Trivedi /"Computer Networks", Oxford University Press

Other Reference Book (Theory):

1. Internetworking with TCP/IP Douglas E Comer
2. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill, Fourth Edition
3. Andrew S. Tanenbaum, "Computer Networking", Prentice Hall, Fourth Edition

E Resources:

- 1) <http://nptel.ac.in/courses/106105082/16>
- 2) <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-02-introduction-to-eecs-ii-digital-communication-systems-fall-2012/lecture-videos/lecture-4-linear-block-codes-parity-relations/>

Chapter Wise Coverage from Text Book and first reference book:

Unit No.	Topics/Subtopics	No of Lectures
1	1.1,1.2.1, 1.2.2,1.2.3, 1.2.4,1.2.5, 1.2.6,1.2.7,1.2.8. 1.2.10,1.3 2.1,2.2 3.1, 3.2	1 1 1 1 2 2 2
2	4.1 4.2.1,4.2.2 4.2.3 to 4.2.8 5.1 5.2.1 to 5.2.3 5.2.4 to 5.2.7 5.2.8 to 5.2.11,	1 1 1 1 2 2 2
3	6.1 6.2 6.3 and 6.4, 7.1,7.2 7.3 to 7.6 7.7,	1 2 2 2 1 2
4	8.1, 8.2 8.3 , 9.1, 9.2.1 to 9.2.5,	2 3 2 3

5	Complete chapter 28 from first reference book	
	28.1 to 28.3	1
	28.4, 28.5	1
	28.6, 28.7	1
	28.7, 28.8	1
	28.9, 28.10	1
	28.11, 28.12	1
	28.13, 28.14	1
	28.15, 28.17	2
	28.18,28.19	1
	Complete chapter 30 from first reference book	
	30.1 to 30.3	1
	30.4, 30.5	1
	30.6, 30.7	1
	30.7, 30.8	1
30.9, 30.10	2	
30.11, 30.12	2	
30.13, 30.15	2	
Total Number of Lectures		50

Note:

Students are not required to reproduce the entire algorithms/protocol code in the theory exam for any protocols and routing algorithms. Concepts based on these algorithms/protocols should be asked in theory exam.

MCA
SEM – IV
0701402 Soft Skills

1. Course Objective:

- Development of verbal and written communication skills.
- Development of skills for interviews, group communication, and effective presentation
- Learning techniques for effective reading, writing, etc.

2. Course Duration:

The course will have sessions which are divided into five modules. Each unit consists of different no of sessions of 60 minutes each and carries marks weightage.

3. Course Content:

Unit No.	Contents	No. of Sessions	Marks Weightage
I	<p>Introduction to Communication: Importance of Communication, Basics of Communication, Purpose, Audience, Cross-Cultural Communication, Language, Communicative Skills, Effective Communication, Modes of Communication</p> <p>Basics of Technical Communication: Objectives and Characteristics of Technical Communication, Process of Communication, Levels of Communication, Flow of Communication, Communication Networks, Visual Aids in Technical Communication</p>	10	20%
II	<p>Effective Presentation Strategies: Introduction, Planning, Outlining and Structuring, Nuances of Delivery, Controlling Nervousness and Stage Fright, Visual Aids in Presentations</p> <p>Introduction to Modern Communication Media: Introduction, Technology Based Communication Tools, Positive Impact of Technology-enabled Communication, Negative Impact of Technology-enabled Communication, Selection of Appropriate Technology, Effectiveness in Technology based Communication</p>	10	20%
III	<p>Letters, Memos and Email: Introduction, Letter Writing, Business Letters, Cover Letters, Resumes, Memos, Emails</p>	10	20%
IV	<p>Reports: Introduction, Characteristics of a Report, Categories of Reports, Formats, Prewriting, Structure of Reports, Types of Reports, Writing the Report</p> <p>Research Paper and Dissertation: Introduction, Characteristics and Components of a Research Paper, Dissertation</p>	10	20%

V	<p>Interviews: Objectives of Interviews, Types of Interviews, Job Interviews, Media Interviews, Press Conferences</p> <p>Group Communication: Introduction, Forms of Group Communication, Use of Body Language, Discussions, Group Discussions, Organizational GD, GD as Part of Selection Process, Meetings, Conferences, Symposia and Seminars, Negotiations</p>	10	20%
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Teaching Methods:

The following pedagogical tools will be used to teach this course:

- (1) Lectures & Discussions
- (2) Assignments & Presentations

E Resources:

- 1) <http://freevidelectures.com/Course/3464/English-Grammar>
- 2) <http://freevidelectures.com/Course/3449/English-Grammar>
- 3) <http://www.watchknowlearn.org/Category.aspx?CategoryID=134>
- 4) <http://www.watchknowlearn.org/Category.aspx?CategoryID=5718>
- 5) <http://www.watchknowlearn.org/Category.aspx?CategoryID=1899>
- 6) <http://www.watchknowlearn.org/Category.aspx?CategoryID=1863>

Evaluation:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

1.	Internal Exam	50%
2.	External Exam	50%

Basic Text Book:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1.	Meenakshi Raman & Sangeeta Sharma	Technical Communication – Principles and Practice	Oxford University Press, 2011	2nd Edition

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Huckins Thomas	Technical Writing and Professional Communication	McGraw Hill Publication	Latest Edition

2	Paul V Anderson	Technical Communication – A Reader Centred Approach	Thomson Publication	6th Edition
3	Ashraf Rizvi	Effective Technical Communication	TMGH Publication	Latest Edition
4	Sharon J. Gerson, Steven M. Gerson	Technical Writing – Process & Product	Pearson	5th Edition

Chapter wise Coverage from Main Reference:

Unit #	Chapters
Unit I	1,3
Unit II	8,23
Unit III	17
Unit IV	18, 20
Unit V	9,10

Session Plan:

Session No.	Topics / Chapters
1 - 2	Importance of Communication, Basics of Communication, Purpose
3 - 4	Audience, Cross-Cultural Communication, Language, Communicative Skills, Effective Communication
5 - 6	Modes of Communication, Objectives and Characteristics of Technical Communication, Process of Communication
7 - 8	Levels of Communication, Flow of Communication
9 – 10	Communication Networks, Visual Aids in Technical Communication
11 - 13	Introduction, Planning, Outlining and Structuring, Nuances of Delivery
14 - 16	Controlling Nervousness and Stage Fright, Visual Aids in Presentations
17 - 18	Introduction, Technology Based Communication Tools, Positive Impact of Technology-enabled Communication, Negative Impact of Technology-enabled Communication
19 - 20	Selection of Appropriate Technology, Effectiveness in Technology-based Communication
21 - 23	Introduction, Letter Writing
24 - 26	Business Letters, Cover Letters
27 - 30	Resumes, Memos, Emails
31 - 33	Introduction, Characteristics of a Report, Categories of Reports, Formats
34 - 37	Prewriting Structure of Reports, Types of Reports, Writing the Report.
38 - 40	Introduction, Characteristics and Components of a Research Paper, Dissertation
41 – 43	Objectives of Interviews, Types of Interviews
44 - 46	Job Interviews, Media Interviews, Press Conferences
47 - 48	Introduction, Forms of Group Communication, Use of Body Language,

	Discussions, Group Discussions
49 - 50	Organizational GD, GD as Part of Selection Process, Meetings, Conferences, Symposia and Seminars, Negotiations its services

**M.C.A.
Sem IV**

0701403 Management Information System

1. Course Objective:

Main focus of the subject is emphasis on business problems, its solutions and show case of new opportunities with advancement of technology. It provides a conceptual insight on the functions of management, importance of information, information needs at different levels. It also elaborate the applications of information technology for business management at various management levels.

2. Course Duration:

Course duration is of 15 weeks, which includes 4 lectures per week.

3. Course Content:

Module No.	Topics / Chapters Name	No. of Sessions	% Weightage
I	Information and Management: Definition of Information, Types of Information, Sources, Values and Control of Information, Implications of Information in Business & MIS Need for Information Systems, Examples of Information Systems	10	20
II	Information security challenges in E-Enterprise, security threats and vulnerability, managing security threats in E-business, Information security, Impact of IT on organizations and society, Technical solutions for privacy protection, Information security quality and impact	10	20
III	Decision-making, Process and Modeling, MIS and Decision-Making, Classification of Information, Methods of Data and Information Collection, Model of Human as Information Processor, Knowledge & Knowledge Management Systems, Business Intelligence	10	20

IV	System Concept & Control, General Model of MIS, Decision Support System, Group Decision Support System, Knowledge Based Expert Systems, Benefits of DSS	10	20
V	Application of MIS in various Manufacturing Sectors as well as Non-Manufacturing (Service) Sectors, Introduction to Data warehouse, organization and management of Data warehouse, Implementation of DW, Business Intelligence, Overview of ERP and integrated System	10	20

Teaching Methods:

The following pedagogical tools will be used to teach this course:

- 1 Lectures & Discussions
- 2 Assignments & Presentations
- 3 Case Analysis

Evaluation:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

1.	Assignments / Presentations/ Quizzes / Class Participation etc.	30% (Internal Assessment)
2.	Internal Examination (Mid Semester Exam)	20% (Internal Assessment)
3.	External Examination (University Exam / End Semester Exam)	50% (External Assessment)

Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	V. Rajaraman	Analysis and Design of Information Systems (Chap -1,2)	PHI Publication	2 nd Edition
2	Waman S. Jawadekar	Management Information	Tata McGrawHill	Latest Edition

		Systems – Text & Cases (Chap – 4,5,6,7,8,12,13,14, 19)	Publication	
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Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Stephen Haag, Maeve Cummings, Amy Philips	Management Information Systems – For the Information Age	McGraw-Hill Publication	Latest Edition
2	Leonard Jessup, Joseph Valacich	Information Systems Today – Managing in the Digital World	PHI Publication	Latest Edition

Online Resources:

1. www.nptel.ac.in/courses/122105022
2. www.nptelvideos.in/2012/11/management-information-system.html

Session Plan:

Session No.	Topics / Chapters
1-2	Definition of Information, Types of Information
3-5	Sources, Values and Control of Information, Implications of Information in Business & MIS
6-7	Need for Information Systems, Examples of Information Systems
8-10	Information security challenges in E-Enterprise, security threats and vulnerability
11-12	Managing security threats in E-business, Information security

13-15	Impact of IT on organizations and society, Technical solutions for privacy protection
16-18	Information security quality and impact, Decision-making, Process and Modeling
19-22	MIS and Decision-Making, Classification of Information, Methods of Data and Information Collection
23-26	Model of Human as Information Processor, Knowledge & Knowledge Management Systems, Business Intelligence
27-29	System Concept & Control, General Model of MIS
30-32	Decision Support System, Group Decision Support System
33-37	Knowledge Based Expert Systems, Benefits of DSS
38-41	Application of MIS in various Manufacturing Sectors as well as Non-Manufacturing (Service) Sectors
42-45	Introduction to DW, organization and management of Data warehouse
46-48	Implementation of DW, Introduction to Business Intelligence
49-50	Overview of ERP

CEC:

CEC will be based on Assignments, attendance, class presentations and case studies given in the classroom.

**MCA II,
Sem IV**

0703404 Data Warehousing and Data Mining

1. Course Objective:

This subject focuses on the basic concepts of data warehousing and data mining along with the applications of Data mining.

2. Course Duration:

Course duration is of 15 weeks, which includes 4 lectures per week.

3. Course Content:

Module No.	Topics / Chapters Name	No. of Sessions	% Weightage
I	Introduction to Data Mining. Kinds of Data Can Be Mined. Kinds of Patterns Can Be Mined. Which Technologies Are Used? Kinds of Applications Are Targeted. Major Issues in Data Mining.	12	20
II	Data Objects and Attribute Types, Data Preprocessing: An Overview, Data Cleaning, Integration, reduction, Data, Transformation and Data Discretization	12	20
III	DataWarehousing and Online Analytical Processing, Basic Concept, DataWarehouse Modeling: Data Cube and OLAP, DataWarehouse Design, Usage and implementation.	12	20
IV	Data Cube Technology, Preliminary Concepts, Data Cube Computation Methods, Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and Methods	12	20

V	Basic Concepts Classification, General Approach to Classification, Decision Tree Induction Bayes Classification Methods, Naive Bayesian Classification, Rule-Based Classification, Using IF-THEN Rules for Classification	12	20
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Teaching Methods:

The following pedagogical tools will be used to teach this course:

- 1 Lectures & Discussions
- 2 Assignments & Presentations
- 3 Case Analysis

Evaluation:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

1.	Assignments / Presentations/ Quizzes / Class Participation etc.	30% (Internal Assessment)
2.	Internal Examination (Mid Semester Exam)	20% (Internal Assessment)
3.	External Examination (University Exam / End Semester Exam)	50% (External Assessment)

Basic Text Book:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Jiawei Han and Micheline Kamber	Data mining concepts and techniques (e-book in form of PDF is available)	Elsevier	Third Edition

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Stephen Haag, Maeve Cummings, Amy Philips, Pang-Ning Tan, Michael Steinbach and Vipin Kumar	Introduction to Data Mining	Pearson education	Latest Edition
2	Alex Berson and Stephen J. Smith	Data Warehousing, Data Mining & OLAP	Tata McGraw – Hill Publication	Latest Edition
3	Arun K. Pujari	Data Mining Techniques	University Press	Latest Edition

Session Plan:

Session No.	Topics / Chapters
1-3	Moving toward the Information Age, Data Mining as the Evolution of Information Technology, What Is Data Mining?, What Kinds of Data Can Be Mined?
4-6	What Kinds of Patterns Can Be Mined? Mining Frequent Patterns, Associations, and Correlations, Classification and Regression for Predictive Analysis
7-10	Data Objects and Attribute Types, Data Preprocessing: An Overview, Data Quality: Why Preprocess the Data?, Major Tasks in Data Preprocessing
11-14	Data Cleaning, Data Integration, Data reduction, Data transformation and data discretization

15-18	DataWarehouse: Basic Concepts, DataWarehousing and Online Analytical Processing, DataWarehouse Modeling: Data Cube and OLAP
19-21	DataWarehouse Design and Usage, DataWarehouse Implementation
22-25	Data Cube Computation: Preliminary Concepts, Data Cube Computation Methods, Precomputing Shell Fragments for Fast High-Dimensional OLAP
26-30	Mining Frequent Patterns, Associations, and Correlations, Frequent Itemset Mining Methods, Which Patterns Are Interesting?—Pattern Evaluation Methods
31-35	Basic Concepts of What Is Classification, General Approach to Classification, Decision Tree Induction
36-41	Bayes Classification Methods, Rule-Based Classification, Rule Extraction from a Decision Tree, Model Evaluation and Selection
42-47	Model Selection Using Statistical Tests of Significance, Techniques to Improve Classification Accuracy, Improving Classification Accuracy of Class-Imbalanced Data

CEC:

CEC will be based on Assignments, attendance, class presentations and data mining applications.

MCA – SEM – IV
0703405 Mobile Application Development using Andorid

1. Course Objective:

The main objective of this course is to acquaint the students with the core concepts of mobile application development ANDROID. The students will learn the concepts starting from the basics like architecture of ANDROID, application development process, basic steps involved in application development, basic controls involved in application development, various layouts, design requirements, working with images and animations, preferences management, local data storage and database integration which are widely required when developing an entire application. Advanced features like integrating web services using JSON, working with location based services and sensor based programming, will also be the objective of the course. The course enables the students to visualize as well as synthesize a real world application scenario and makes them ready for development and implementation of such applications.

2. Course Duration:

The course is distributed amongst five units consisting of various sessions of sixty minutes each and carries a weightage as per the importance and complexity of the topics covered in the unit.

3. Course Content:

Unit	Topics / Sub – Topics	Sessions	Marks Weightage
I	Introduction to ANDROID ANDROID SDK Features, Introduction to Development Features Basics of ANDROID Developing for ANDROID, developing for mobile and embedded devices, ANDROID development tools Creating Applications using ANDROID Basics of an ANDROID application, introduction to manifest, externalizing resources, application lifecycle, ANDROID activities	10	20%
II	Building user interfaces Introduction to layouts, introduction to fragments,	10	20%

	<p>creating new views, introduction to adapters</p> <p>Intents and broadcast receivers</p> <p>Introduction to intents, creating intents and broadcast receivers</p> <p>Using Internet resources</p> <p>Downloading and parsing internet resources, using the download manager, using internet services</p>		
III	<p>Files, saving state and preferences</p> <p>Creating, saving and retrieving shares preferences, including static files as resources, working with the file system</p> <p>Database and content providers</p> <p>Introducing ANDROID databases, content values and cursors, working with SQLite databases, creating content providers, using content providers, native ANDROID content providers</p> <p>Working in background</p> <p>Introducing services, using background threads, using alarms</p>	10	20%
IV	<p>Enhancing user experience</p> <p>Introduction and addition of action bar, menus and dialogs, drawables and gradients, custom animations</p> <p>Hardware sensors</p> <p>Sensors and sensor manager, monitoring devices' movement and orientation</p> <p>Maps and location based services</p> <p>Using location based services, selecting a location provider, finding your current location, creating map based activities</p>	10	20%
V	<p>Audio, video and using the camera</p> <p>Playing audio and video, manipulating raw audio, using</p>	10	20%

	<p>camera to take pictures, recording video, adding media to media store</p> <p>Telephony and SMS</p> <p>Hardware support for telephony, using telephony, introducing SMS and MMS</p> <p>Monetizing, promoting and distributing the applications</p> <p>Signing and publishing applications, distributing applications, introduction to monetizing applications</p>		
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Teaching Methods:

The following pedagogical tools will be used to teach this course:

- (1) Lectures and Discussions
- (2) Assignments and Presentations
- (3) Practical Implementations and projects

Evaluation:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

1.	Assignments / Presentations/ Quizzes / Class Participation etc.	30% (Internal Assessment)
2.	Internal Examination	20% (Internal Assessment)
3.	External Examination (University Exam)	50% (External Assessment)

Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Reto Meier	Professional ANDROID 4 Application Development	WROX	Latest Edition

Reference Books:

Sr. No.	Author(s)	Name of the Book	Publisher	Edition
1	B M Harwani	ANDROID Programming Unleashed	Pearson Education	Latest Edition
2	Lauren Darcy, Shane Conder	ANDROID Application Development in 24 hours	Pearson Education	Latest Edition

Online Resources:

Sr. No.	Link
1	https://www.edx.org/course/introduction-mobile-application-hkustx-comp107x-0
2	http://www.learnerstv.com/Free-Computer-Science-Video-lectures-ltv461-Page1.htm

3	https://www.udacity.com/course/developing-android-apps--ud853
4	https://thenewboston.com/videos.php?cat=278

Tools/Technologies to be used:

1. ANDROID Studio [Latest Version]
2. ANDROID Version [Jelly Bean and later]

Session Plan:

Session No.	Topics	Chapter No from textbook
UNIT I		
1	ANDROID SDK Features	Ch – 1
2	Introduction to Development Features	Ch – 1
3	Developing for ANDROID	Ch – 2
4	Developing for mobile and embedded devices	Ch – 2
5	ANDROID development tools	Ch – 2
6	Basics of an ANDROID application	Ch – 2
7	Introduction to manifest	Ch – 2
8	Externalizing resources	Ch – 3
9	Application lifecycle	Ch – 3
10	ANDROID activities	Ch – 3
UNIT II		
11	Introduction to layouts	Ch – 4
12	Introduction to fragments	Ch – 4
13	Creating new views	Ch – 4
14	Introduction to adapters	Ch – 4
15	Introduction to intents	Ch – 5
16	Creating intents	Ch – 5
17	Creating broadcast receivers	Ch – 5
18	Downloading and parsing internet resources	Ch – 6
19	Using the download manager	Ch – 6
20	Using internet services	Ch – 6
UNIT III		
21	Creating, saving and retrieving shares preferences	Ch – 7
22	Including static files as resources	Ch – 7
23	Working with the file system	Ch – 7
24	Introducing ANDROID databases, content values and cursors	Ch – 8
25	Working with SQLite databases	Ch – 8
26	Using Date functions in MySQL and using them with PHP	Ch – 8
27	Creating content providers, using content providers	Ch – 8
28	Native ANDROID content providers	Ch – 8
29	Introducing services	Ch – 9
30	Using background threads, using alarms	Ch – 9
UNIT IV		
31	Introduction and addition of action bar	Ch – 10
32	Menus and dialogs	Ch – 10
33	Drawables and gradients	Ch – 11

34	Custom animations	Ch – 11
35	Sensors and sensor manager	Ch – 12
36	Monitoring devices' movement and orientation	Ch – 12
37	Using location based services	Ch – 13
38	Selecting a location provider	Ch – 13
39	Finding your current location	Ch – 13
40	Creating map based activities	Ch – 13
	UNIT V	
41	Playing audio and video	Ch – 15
42	Manipulating raw audio	Ch – 15
43	Using camera to take pictures	Ch – 15
44	Recording video, adding media to media store	Ch – 15
45	Hardware support for telephony	Ch – 17
46	Using telephony	Ch – 17
47	Introducing SMS and MMS	Ch – 17
48	Signing and publishing applications	Ch – 19
49	Distributing applications	Ch – 19
50	Introduction to monetizing applications	Ch – 19

MCA
SEM – IV
0703406 Introduction to Python

1. Course Objective:

The main objective of this course is to make the students marketable with skills in developing any application using open source programming language Python and web application using Python-based web application framework Django.

Students will be introduced to rich data structures and library available in Python to create desktop application, web application, GUI application with event-driven programming and so on. Students will become aware of broad range of Pythonic tools for network programming, multi-media programming, thread-based programming etc.

2. Course Duration:

The course will have sessions which are divided into five modules. Each module consists of ten sessions of 60 minutes each and carries a weightage of 20%.

3. Course Content:

Module No.	Modules/Sub-Modules	No. of Sessions	Marks Weightage
I	<ul style="list-style-type: none">• Python basics: comments, literals, standard data types, none data type, print, raw_input, object value and object reference, indentation for a block of statements, overview: control structures, function, class, object, module• Number types, operators and functions, related modules• Sequences: string, tuple, list, list comprehension• Set, Dictionary, dictionary comprehension	10	20%
II	<ul style="list-style-type: none">• range function• conditional statement, branching expression• loops (including while..else, for..else), pass, break, continue, iterators• Functions, default parameters, keyword parameters, variable arguments parameters, function documentation, global variable, variable scope,	10	20%

	recursion <ul style="list-style-type: none"> • lambda, apply, filter, map, reduce • Generators 		
III	<ul style="list-style-type: none"> • Exception handling • Concept of module and package, introduction to using Python modules and packages • Files and Input/Output operations, overview:pickle, marshal, shelve • Introduction to regular expression 	10	20%
IV	<ul style="list-style-type: none"> • Object-oriented programming: class, instance, inheritance • Understanding Django framework: create project, create application, directory structure of Django project, web server, creating simple view using views and urls, create database and configure database access, create simple model, activate model and add data using API, Django architecture: Model-Template-Views architecture (MTV) 	10	20%
V	<ul style="list-style-type: none"> • Data models: field types, field options, building a Model and interacting with it via the ORM (object-relational mapper); migrating schemas, adding relationships to models, database operations in views, configuring web page views • Templates: Using Django templates to create custom views, using built-in template tags and filters • Forms • Handling GET and POST requests, add/update data in database 	10	20%

Teaching Methods:

The following pedagogical tools will be used to teach this course:

- (1) Lectures & Discussions
- (2) Assignments & Presentations
- (3) Case Analysis

Evaluation:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

1.	Assignments / Presentations/ Quizzes / Class Participation etc.	30% (Internal Assessment)
2.	Internal Examination	20% (Internal Assessment)
3.	External Examination (University Exam)	50% (External Assessment)

Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
T1	Wesley Chun	Core Python Programming	Pearson Education,	Second edition, 2008
T2	Brad Dayley	Sams Teach Yourself Django in 24 hours	Pearson Education	2009

Reference URLs:

Sr No.	URL
1	https://docs.python.org/3/tutorial/
2	www.tutorialspoint.com/python/python_tutorial.pdf
3	https://www.cs.uky.edu/~keen/115/Haltermanpythonbook.pdf
4	Byte of Python - http://files.swaroopch.com/python/byte_of_python.pdf
5	Dive Into Python - http://www.diveintopython.net/ , http://www.renderx.com/files/demos/examples/diveintopython.pdf
6	https://docs.djangoproject.com/en/1.9/intro/
7	https://media.readthedocs.org/pdf/django/latest/django.pdf

Online Resources:

1	http://nptel.ac.in/courses/117106113/38
2	http://nptel.ac.in/courses/117106113/39

3	http://www.learnerstv.com/Free-Computer-Science-Video-lectures-ltv163-Page1.htm
4	http://onlinevideolecture.com/?course_id=2170
5	http://www.learnerstv.com/Free-Computers-Video-lectures-ltv006-Page1.htm
6	https://www.coursera.org/learn/python

Session Plan:

Module	Sessions	Topics (Emphasis on practical applications)	
I	1-3	Python basics: comments, literals, standard data types, none data type, print, raw_input, object value and object reference, indentation for a block of statements, overview: control structures, function, class, object, module	
	4-5	Number types, operators and functions, related modules	
	6-8	Sequences: string, tuple, list, list comprehension	
	9-10	Set, Dictionary, dictionary comprehension	
II	11-13	range function, conditional statement, branching expression, loops (including while..else, for..else), pass, break, continue, iterators	
	14-18	Functions, default parameters, keyword parameters, variable arguments parameters, function documentation, global variable, variable scope, recursion	
	19-20	lambda, apply, filter, map, reduce, generators	
III	21-22	Exception handling	
	23-24	Concept of module and package, introduction to using Python modules and packages	
	25-28	Files and Input/Output operations, overview: pickle, marshal, shelve	
	29-30	Introduction to regular expression	
IV	31-34	Object-oriented programming: class, instance, inheritance	
	35-40	Understanding Django framework: create project, create application, directory structure of Django project, web server, creating simple view using views and urls, create database and configure database access, create simple model, activate model and add data using	

		API, Django architecture: Model-Template-Views architecture (MTV)	
V	41-43	Data models: field types, field options, building a Model and interacting with it via the ORM (object-relational mapper); migrating schemas, adding relationships to models, database operations in views, configuring web page views	
	44-46	Templates: Using Django templates to create custom views, using built-in template tags and filters	
	47-48	Form	
	49-50	Handling GET and POST requests, add/update data in database	

MCA
SEM – IV
0703407 Mobile Communications

1. Course Objective:

The main objective of this course is to acquaint the students with the core concepts of mobile communications and make them acquire knowledge pertaining to mobile communications architecture, mobility management, hand-off handling, cellular digital packet data, GSM, short messaging services, mobile number portability, VoIP, GPRS, mobile prepaid phone services, WAP, 3rd Generation mobiles, WLL and WEN.

2. Course Duration:

The course is distributed amongst five units consisting of various sessions of sixty minutes each and carries a weightage as per the importance and complexity of the topics covered in the unit.

3. Course Content:

Unit	Topics / Sub – Topics	Sessions	Marks Weightage
I	<p>Introduction</p> <p>Personal Communication Services (PCS), Cellular Telephony, Cordless Telephony, Personal Area Communications Systems (PACS), Third generation wireless systems</p> <p>Mobility Management</p> <p>Handoff, roaming management</p>	10	20%
II	<p>Handoff Detection and assignment</p> <p>Handoff detection, strategies for handoff detection, channel assignment</p> <p>Radio link and transfer</p> <p>Link transfer types, hard handoff, soft handoff</p> <p>PACS network signaling</p> <p>PACS Network elements, PACS Network interfaces, Call origination, call termination, intersystem handoff</p>	10	20%

III	<p>Cellular Digital Packet Data</p> <p>CDPD architecture, CDPD air interface</p> <p>GSM</p> <p>GSM overview, GSM architecture, location tracking and call setup</p> <p>GSM Mobility management</p> <p>GSM location update, mobility databases, failure restoration</p>	10	20%
IV	<p>GSM Short Message Services</p> <p>SMS architecture, mobile oriented messaging, mobile terminated messaging</p> <p>Mobile number portability</p> <p>Fixed network number portability, number portability with mobile networks, implementation costs of mobile number portability</p> <p>VoIP Service for Mobile Networks</p> <p>GSM on the Net, iGSM Wireless VoIP solution, iGSM procedures and message flows, implementation issues</p> <p>Mobile Prepaid phone services</p> <p>Mobile prepaid services, comparison of prepaid solutions</p>	10	20%
V	<p>General Packet Radio Service (GPRS)</p> <p>GPRS functional groups, GPRS architecture, GPRS network nodes, GPRS interfaces, evolving from GSM to GPRS</p> <p>WAP</p> <p>WAP model, WAP gateway, Wireless bearers for WAP, WAP developer toolkits, mobile station application execution environment</p> <p>3rd generation mobile services</p> <p>W-CDMA and CDMA2000, quality of service in 3G,</p>	10	20%

	<p>impact on manufacturer and operator technologies</p> <p>Wireless Local Loop</p> <p>WLL architecture, deployment issues, WLL technologies</p> <p>Wireless Enterprise Networks</p> <p>Enterprise Telephony, Enterprise location system, Enterprise PCS: Office level and enterprise level</p> <p>4G, LTE, VoLTE</p> <p>[Refer from:]</p> <p>[https://en.wikipedia.org/wiki/LTE_(telecommunication)]</p> <p>[https://en.wikipedia.org/wiki/Voice_over_LTE]</p> <p>[http://www.digitaltrends.com/mobile/4g-vs-lte/]</p> <p>[https://en.wikipedia.org/wiki/4G]</p>		
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Teaching Methods:

The following pedagogical tools will be used to teach this course:

- (1) Lectures and Discussions
- (2) Assignments and Presentations
- (3) Practical Implementations and projects

Evaluation:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

1.	Assignments / Presentations/ Quizzes / Class Participation etc.	30% (Internal Assessment)
2.	Internal Examination	20% (Internal Assessment)
3.	External Examination (University Exam)	50% (External Assessment)

Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Yi-Bang Lin And Imrich Chlamtac	Wireless and Mobile Networks Architechtures	Wiley	Latest Edition

Reference Books:

Sr. No.	Author(s)	Name of the Book	Publisher	Edition
1	Friedhelm Hillebrand	GSM and UMTS The creation of global mobile communication	Wiley	Latest Edition
2	William Stallings	Wireless communication networks	Pearson	Latest Edition

Session Plan:

Session No.	Topics
	UNIT I
1	Personal Communication Services (PCS)
2	Cellular Telephony
3	Cordless Telephony
4	Personal Area Communications Systems (PACS)
5	Third generation wireless systems
6	Basics of an ANDROID application
7	Handoff
8	Handoff
9	Roaming management
10	Roaming management
	UNIT II
11	Handoff detection
12	Strategies for handoff detection
13	Channel assignment
14	Link transfer types
15	Hard handoff, soft handoff
16	PACS Network elements
17	PACS Network interfaces
18	Call origination
19	Call termination
20	Intersystem handoff
	UNIT III
21	CDPD architecture
22	CDPD air interface
23	GSM overview
24	GSM architecture
25	Location tracking
26	Call setup
27	GSM location update
28	GSM location update
29	Mobility databases
30	Failure restoration
	UNIT IV
31	SMS architecture
32	Mobile oriented messaging, mobile terminated messaging
33	Fixed network number portability

34	Number portability with mobile networks
35	Implementation costs of mobile number portability
36	GSM on the Net
37	iGSM Wireless VoIP solution
38	iGSM procedures and message flows, implementation issues
39	Mobile prepaid services
40	Comparison of prepaid solutions
	UNIT V
41	GPRS functional groups, GPRS architecture
42	GPRS network nodes, GPRS interfaces, evolving from GSM to GPRS
43	WAP model, WAP gateway
44	Wireless bearers for WAP, WAP developer toolkits
45	Mobile station application execution environment
46	W-CDMA and CDMA2000
47	Quality of service in 3G, impact on manufacturer and operator technologies
48	WLL architecture, deployment issues, WLL technologies
49	Enterprise Telephony, Enterprise location system
50	Enterprise PCS: Office level and enterprise level, 4G, LTE, VoLTE

Master of Computer Applications
Semester - IV
0703408 Business Analyses

Course Objective:

After Completing this course student will able:

- To prepare the students for the role of Business Analyst in the industry.
- To analyze the data as per the Business point of view.
- To understand the Customer's Perspective from technical aspects.
- To understand the dynamic nature of Business Processes.

Course Duration:

The duration of course is a semester. The syllabus is divided in five modules. Total 50 theory lectures have been allocated for the same.

Course Content:

UNIT	CONTENT	No. of LECTURES	MARKS WEIGHTAGE
I	<p>Business Analyst: The Changing Context and Its Evolving Role: Global Economic Concept, Business Context, Technological Context, Emerging Markets, New Industries and New Business Models, Understand Customer's Need, Massive Open Online Course, Changes in Business Analysis Field, Roles of a BA.</p> <p>Frameworks for Business Analysis: Knowledge Areas for a BA, BA Workflow, Stakeholders for a Business Analysts.</p> <p>The customer's Perspective: Latent Needs of a Customer, Customer Experience Journey.</p>	10	20%
II	<p>The Flow Perspective: Workflows, Information Flows, Process Flows, Approach to Mapping Flows, Types , Data Flow Diagrams.</p> <p>The Information Perspective: Information and Information Systems- Concepts, Need, Uses, Relation with Organization. Determining Information Needs, Information Needs and Stakeholders.</p> <p>Decision and Business Rules Perspective: Information Needs for Supporting Decision-Making, Role of Business Intelligence and Analytics, Business Rules, Object</p>	10	20%

	Associations, Database Design.		
III	<p>Dynamic Behavior of a Business Processes: Static versus Dynamic View, Dynamic View, Business Situations/Events, State Transition Diagram.</p> <p>Compliance, Quality, Security and Other Perspectives: Process Standards, Information Security Standards, Accounting and Governance Standards, Industry Specific Acts and Standards, Transition Perspective.</p> <p>Visualizing an IT-Based Solutions: The Solution Perspective : The Use Case Approach, Direct and Indirect Users, Self-help Systems, Writing Use Cases, Business Use Cases versus System Use Cases, Application of Use Cases, Interaction Design, Functional Structure of the Organization, Cultural Context.</p>	10	20%
IV	<p>Innovation Perspective: Introduction to Innovation, Design Led Innovation, Parallel Innovation, Challenging Business Rules, Transferring Learning, Innovation in Customer Experiences, Futuristic Technologies.</p> <p>Enterprise Perspective I: Business Strategy and Enterprise Architecture: Industry Structure and Composite Analysis, Business Model Analysis, Strategic Alignment, Innovation, Enterprise Architecture.</p> <p>Enterprise Perspective II: Information and IT Strategy : Metaphors, Business Value of IT, Strategic Grid, IT Initiatives, Technology Forecasting and Selection.</p>	10	20%
V	<p>Outcomes of Business Analysis: Consolidation and Synthesis: Consolidating the Requirements, Mapping SRS, Tips for Documenting Requirements, Writing Business Case for an IT Solution, Quantifying Business Benefits, Investments, Scoping of an IT Project.</p> <p>Business Analysis Case Study: Basic Facts of the Case: ABC Gasses, CEO's 1 Page Report, Solution Perspective, Role and Choice of Technology.</p> <p>Evolving Role of a Business Analysis and Practice Areas: Roles of BA in – IT Companies, Non-IT Companies, Corporate Group CIO's Office, Practice Areas of BA.</p>	10	20%

Teaching Methods:

The following pedagogical tools will be used to teach this course (Sample tools):

- a) Lectures and video sessions
- b) Presentations
- c) Assignments
- d) Case Study

Evaluation:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

1.	CEC Component (Assignments/Quizzes)	20 % (Internal Assessment)
2.	Internal Examination (Mid Semester Exam)	30% (Internal Assessment)
3.	External Examination (University Exam / End Semester Exam)	50% (External Assessment)

Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1.	Pradeep Hari Pendse	Business Analysis - Solving Business Problems by Visualizing Effective Processes and IT Solutions	PHI	Second

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1.	Barbara A. Carkenord	Seven Steps to Mastering Business Analysis	CENGAGE Learning	Latest

Session Plan:

Session No.	Topics	Text Book. Chapter
1-3	Business Analyst: The Changing Context and Its Evolving Role: Global Economic Concept, Business Context, Technological Context, Emerging Markets, New Industries and New Business Models	1
4-5	Understand Customer's Need, Massive Open Online Course, Changes in Business Analysis Field, Roles of a BA.	1
6-8	Knowledge Areas for a BA, BA Workflow, Stakeholders for a Business	2

	Analysts.	
9-10	Latent Needs of a Customer, Customer Experience Journey.	3
11-13	Flow : Workflows, Information Flows, Process Flows, Approach to Mapping Flows, Types , Data Flow Diagrams.	4
14-16	Information and Information Systems- Concepts, Need, Uses, Relation with Organization. Determining Information Needs, Information Needs and Stakeholders.	5
17-18	Information Needs for Supporting Decision-Making, Role of Business Intelligence and Analytics	6
19-20	Business Rules, Object Associations, Database Design.	6
21-23	Dynamic Behavior of a Business Processes: Static versus Dynamic View, Dynamic View, Business Situations/Events, State Transition Diagram.	7
24-26	Process Standards, Information Security Standards, Accounting and Governance Standards, Industry Specific Acts and Standards, Transition Perspective.	8
27-28	The Use Case Approach, Direct and Indirect Users, Self-help Systems, Writing Use Cases, Business Use Cases versus System Use Cases, Application of Use Cases,	9
29-30	Interaction Design, Functional Structure of the Organization, Cultural Context.	9
31-32	Innovation Perspective: Introduction to Innovation, Design Led Innovation, Parallel Innovation	10
33-34	Challenging Business Rules, Transferring Learning, Innovation in Customer Experiences, Futuristic Technologies.	10
35-36	Industry Structure and Composite Analysis, Business Model Analysis, Strategic Alignment, Innovation, Enterprise Architecture.	11
37-38	Metaphors, Business Value of IT, Strategic Grid	12
39-40	IT Initiatives, Technology Forecasting and Selection.	12
41-42	Outcomes of Business Analysis: Consolidating the Requirements, Mapping SRS, Tips for Documenting Requirements,	13
43-44	Writing Business Case for an IT Solution, Quantifying Business Benefits, Investments, Scoping of an IT Project.	13
45-46	Basic Facts of the Case: ABC Gasses, CEO's 1 Page Report, Solution Perspective, Role and Choice of Technology.	14
47-48	Roles of BA in – IT Companies, Non-IT Companies, Corporate Group CIO's Office	15
49-50	Practice Areas of BA.	15

MCA – II
SEM – IV
0703409 Operations Research (OR)

1. Course Objective:

The objective of the course is to develop basic understanding of Operations Research Techniques to optimize resources, plan activities. Through this course, the students will be able to understand the importance of optimization and how it can be implemented for various fields.

2. Course Duration:

The course will have sessions which are divided into five modules. Each module consists of four sessions of 60 minutes each and carries a weightage of 20%.

3. Course Content:

Module No.	Modules/Sub-Modules	No. of Sessions	Marks Weightage
I	Introduction: Operations Research: An Introduction, Introduction To Linear Programming Problem, Basic Assumptions Of LPP, General Statement Of LPP, Formulation Of LPP, Obtaining Dual From Primal, Symmetric Relationship Between Primal And Dual	10	20%
II	Linear Programming Problem: Graphical Solution To LPP, Simplex Method For Solving LPP, Solving Minimization Problem Using Big M Method	10	20%
III	Transportation Problem: Introduction, Solving Transportation Problem, Complications To Basic Transportation Problem, Unbalanced Transportation Problem Assignment Problem: Introduction, Schematic Introduction, Problem Involving Blocked Allocation, Problem Of Imbalance, Hungarian Assignment Method	10	20%
IV	Network Analysis: Introduction, Network Analysis, Critical Path Activities, Program Evaluation And Review Technique Analysis	10	20%

V	<p>Sequencing Models: Introduction, Johnson's Algorithm, Johnson's Algorithm For Three-Machines Problem, Johnson's Algorithm For M-Machine Problem</p> <p>Game Theory: Introduction, Characteristics Of Game Theory Applications, Methodology, Finding Saddle Point</p>	10	20%
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Teaching Methods:

The following pedagogical tools will be used to teach this course:

- 1 (1) Lectures & Discussions
- 2 (2) Assignments & Presentations
- 3 (3) Case Analysis
- 4

Evaluation:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

1.	Assignments / Presentations/ Quizzes / Class Participation etc.	30% (Internal Assessment)
2.	Internal Examination	20% (Internal Assessment)
3.	External Examination (University Exam)	50% (External Assessment)

Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1.	Pradeep Prabhakar Pai	Operations Research – Principles and Practice	OXFORD	Latest

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1.	J. K. Sharma	Operations Research – Theory and Application	Macmillan Publishers India Ltd.	Latest
2.	Shah, Gor, Soni	Operations Research	PHI	Latest
3.	V. K. Kapur	Operations Research – Problems & Solutions	Sultan Chand & Sons, New Delhi	Latest
4.	Kanti Swarup, Gupta	Operations Research	Sultan Chand &	Latest

	P.K. , Man Mohan		Sons, New Delhi	
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E Resources:

- 1) <http://nptel.ac.in/courses/112106134/1>
- 2) <http://www.learnerstv.com/Free-Management-Video-lectures-Itv293-Page1.htm>

Session Plan:

Session No.	Topics / Chapters
1-5	Operations Research: An Introduction, Introduction To Linear Programming Problem, Basic Assumptions Of LPP, General Statement Of LPP
6-10	Formulation Of LPP
11-12	Obtaining Dual From Primal, Symmetric Relationship Between Primal And Dual
13-14	Graphical Solution To LPP
15-18	Simplex Method For Solving LPP
19-22	Solving Minimization Problem Using Big M Method
23-25	Introduction of Transportation Problem, Solving Transportation Problem
26-28	Complications To Basic Transportation Problem
29	Unbalanced Transportation Problem
30-32	Introduction of Assignment Problem, Schematic Introduction, Problem Involving Blocked Allocation, Problem Of Imbalance
33-35	Hungarian Assignment Method
36-37	Introduction of Network Analysis, Network Analysis
36-39	Critical Path Activities
40-41	Program Evaluation And Review Technique Analysis
42-43	Introduction of Job Sequencing, Johnson's Algorithm
44-45	Johnson's Algorithm For Three-Machines Problem
46-47	Johnson's Algorithm For M-Machine Problem
48-50	Introduction, Characteristics Of Game Theory Applications, Methodology, Finding Saddle Point

GLS UNIVERSITY

MASTER OF COMPUTER APPLICATION

Year - II (Semester - IV)

0701410 Practical Based on 0701401 (FON)

Objectives:

- To gain basic insight of programming for network solutions

Prerequisites:

C Language, Basic UNIX Commands

Course Contents:

Unit No.	Title	Weightage
1	Bit Level Operations: Masking, Binary Conversion, Bit Extraction, Bit Insertion, Setting a Bit, Toggling a Bit using bitwise operators. NOTE: All the operations must be performed using bitwise operators.	20
2	Establishing Connection Between Client and Server: Named pipe creation, Check for availability of connection, Establish connection through the program, Send request from client, Receive request at server and give appropriate response to client, Send received acknowledgement from client to server and vice versa.	20
3	Framing Techniques: Perform below framing techniques: <ul style="list-style-type: none">• Character Count• Bit Stuffing• Byte Stuffing	20
4	Error Detection Techniques: Perform below Error Detection Techniques: <ul style="list-style-type: none">• Single Bit Parity• Block Parity• Checksum• CRC• LRC• VRC	20
5	Error Correction Techniques: Perform Hamming Code Error Correction Technique.	20

Text Book (Theory):

1. Bhushan H Trivedi /"Computer Networks", Oxford University Press

Other Reference Book (Theory):

1. Internetworking with TCP/IP Douglas E Comer
2. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill, Fourth Edition
3. Andrew S. Tanenbaum, "Computer Networking", Prentice Hall, Fourth Edition

MCA
SEM – IV
0703411 Practical Based on 0702404 (DWDM)

Course Objective:

The main objective of this course is to acquaint the students with the core concepts of Data warehousing and data mining application. Practical will be based on the topics like:

- Association Rule Mining
- Clustering
- Sequential pattern mining
- OLAP Mining
- Information extraction and retrieval tools
- Algorithm implementation like Apriori, K-Means

List of practical/Exercise for Laboratory

1. Use data mining techniques for:
 1. To identify association among various items sold, for understanding buying behavior of customers, using algorithms like Apriori, Association Rule Mining
 2. To identify different groups containing objects with similar characteristic using algorithm like K-Means using Clustering.
 3. To identify the patterns containing similar sequences using algorithms like CloSpan, PrefixSpan Sequential pattern mining etc.
2. Use OLAP Mining:
To examine OLAP cubes (multidimensional databases) more thoroughly and easily by finding deviant values automatically.
3. Explore ETL tool to perform the following Exercise:
 1. Import metadata from specific business intelligence tool and populate a metadata repository.
 2. Publish metadata stored in the repository.
 3. Use ETL tools to Extract data from various outside sources, transform it to fit operational needs and, load it into end target database like operational data store, data mart or data warehouse
4. Implement Apriori Algorithm for association rule mining using C/Java
5. Implement K-Means Algorithm for Clustering using C/Java
6. Implement Association Rule Mining algorithms using appropriate programming language

Tools may be used for Lab Exercises:

- (1) Weka
- (2) XL Miner
- (3) MS OLAP Analytics
- (4) ETL Open Source Tools(<http://www.predictiveanalyticstoday.com/top-free-extract-transform-load-etl-software/>)
Talend Open Studio, Clover ETL, GeoKettle ETL, JasperSoft ETL etc
- (5) R Programming Language

- (6) Sipina Research
- (7) Tanagra
- (8) Rapid miner
- (9) RGUI
- (10) Orange canvas
- (11) SPMF

MCA – SEM – III
0703412 Practical Based on 0702405 (Android)

1. Course Objective:

The main objective of this course is to acquaint the students with the core concepts of mobile application development ANDROID. The students will learn the concepts starting from the basics like architecture of ANDROID, application development process, basic steps involved in application development, basic controls involved in application development, various layouts, design requirements, working with images and animations, preferences management, local data storage and database integration which are widely required when developing an entire application. Advanced features like integrating web services using JSON, working with location based services and sensor based programming, will also be the objective of the course. The course enables the students to visualize as well as synthesize a real world application scenario and makes them ready for development and implementation of such applications.

The practical to be developed will majorly be related to the following topics:

1. Building blocks of ANDROID
2. Various controls in ANDROID
3. Various layouts in ANDROID
4. Different resources in ANDROID
5. Handling images in ANDROID
6. Working with files
7. Working with shared preferences
8. Dealing with content providers
9. Working with database

The indicative list of the practicals are as follows:

1. Create an application that designs a layout with three check boxes named with the hobbies (e.g.: cricket, tennis, badminton etc). When the cricket check box is checked than a toast should be displayed with the message ‘Your hobby is Cricket’. When the tennis check box is checked than a toast should be displayed with the message ‘Your hobby is tennis’. When the badminton check box is checked than a toast should be displayed with the message ‘Your hobby is badminton’. When the cricket and badminton check boxes both are checked than a toast should be displayed with the message ‘Your hobby is cricket and

badminton'. When the cricket and tennis check boxes both are checked than a toast should be displayed with the message 'Your hobby is cricket and tennis'. When the badminton and tennis check boxes both are checked than a toast should be displayed with the message 'Your hobby is badminton and tennis'. When all the tree check boxes are checked than the toast should be displayed with the message 'Your hobbies are tennis, cricket and badminton'.

2. Create an application that designs a layout containing a list view having options:

- a. Create file

By clicking on first option Create file a new layout should be displayed having two text boxes file name and file data and one button save. Both file name and data of the file should be entered by the user and on clicking save the file should be saved and proper message should be displayed on saving a file.

- b. Delete file

By clicking on second option delete file a new layout should be displayed having one text box file name and one button delete. The file name should be entered by the user and on clicking delete the file should be deleted and proper message should be displayed on deleting a file.

- c. Display File.

By clicking on third option display file a new layout should be displayed having one text box for file name and one text view for file data and one button display. The file name should be entered by the user and on clicking the display button the contents of the file should be displayed in text view.

3. Create an application that designs a layout having a list view having two options:

- a. Add contacts

On selection of the first option a new layout should be displayed containing two text boxes name and phone no and a button save. The name and phone no should be entered by the user and on clicking the save button the contact should be saved in the contacts directory and appropriate message should be displayed.

- b. Display contacts.

On selection of second option display contacts a new layout should be displayed with list view and all the names from the contacts should be fetched and displayed in the list view.

4. Create an application that designs a layout with a text box and a button named next. The user will enter a number (e.g.:3) in the text box. When the button next is clicked than that number is passed to the next layout and that number of items should be displayed in the list view from the array resource (resources folder). In

case the number exceeds the available values in the array, display all the values from the array.

5. Create an application that designs a layout to store Cricket Player Details like name (textbox), team (textbox), role (radio buttons), date (date control) and a Button named Submit. Roles must be from (Roles: Bowler/ Batsman/ WicketKeeper / All Rounder). When the submit button is selected all the details should be saved in the database.

Also provide a layout to perform the following operations:

- a. List details of bowlers only.
- b. Update role of player in team.

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Reto Meier	Professional ANDROID 4 Application Development	WROX	Latest Edition

Tools to be used:

1. ANDROID Studio [Latest Version]
2. ANDROID Version [Jelly Bean and later]

MCA
SEM – IV
0703413 Practical based on 0703406 (Python)

1. Course Objective:

The main objective of this course is to make the students marketable with practical skills in developing any application using open source programming language Python and web application using Python-based web application framework Django.

2. Course Duration:

The course will have sessions which are divided into five modules.

3. Course Content:

The following is the indicative list of the practicals to be performed in the lab. The list is not exhaustive. Actual programs in the examination may vary from the given list.

Module No.	Modules/Sub-Modules																																														
I	<ol style="list-style-type: none"> 1. Write a program to get the Python version. 2. Write a program to display the current date and time. 3. Write a program to print the calendar of a given month and year using calendar module. 4. Write a program to calculate number of days between two dates. 5. Write a program to accept a filename from the user print the extension of that. 6. Write a program which accept the radius of a circle from the user and compute the area. 7. Use loops and nested loops to print out the calendar for the current month. Try to make sure that your columns line up correctly, like the given example. <div style="text-align: center;"> <p>May 2007</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Mo</td><td>Tu</td><td>We</td><td>Th</td><td>Fr</td><td>Sa</td><td>Su</td> </tr> <tr> <td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td> </tr> <tr> <td></td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td> </tr> <tr> <td></td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td> </tr> <tr> <td></td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td> </tr> <tr> <td></td><td>28</td><td>29</td><td>30</td><td>31</td><td></td><td></td><td></td> </tr> </table> </div>	Mo	Tu	We	Th	Fr	Sa	Su		1	2	3	4	5	6		7	8	9	10	11	12	13		14	15	16	17	18	19	20		21	22	23	24	25	26	27		28	29	30	31			
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	21	22	23	24	25	26	27																																								
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II	<ol style="list-style-type: none"> 1. Write a Python program to get the n (non-negative integer) copies of the first 2 characters of a given sting. Return the n copies of the whole string if the length is less than 2. 2. Write a Python program to count the number of strings where the string length is 3 or more and the first and last character are same from a given list of strings. Sample List : ['abc', 'xyz', 'aba', '1221'] Expected Result : 2 3. Write a program to check whether a specified value is contained in 																																														

	<p>a tuple of values.</p> <ol style="list-style-type: none"> 4. Write a program which accepts a string of comma-separated numbers and generate a list and a tuple with those numbers. 5. Write a program to get a list, sorted in increasing order by the last element in each tuple from a given list of non-empty tuples. Sample List : [(2, 5), (1, 2), (4, 4), (2, 3), (2, 1)] Expected Result : [(2, 1), (1, 2), (2, 3), (4, 4), (2, 5)] 6. Write a program to create a frequency table using a dictionary from a set of input numeric values. 7. Write a program to generate and print a dictionary that contains number (between 1 to n) in the form (x, x*x). Sample Dictionary (n = 5) : Expected Output : {1: 1, 2: 4, 3: 9, 4: 16, 5: 25} 8. Write a program to merge two Python dictionaries. (merge sorted dictionaries) 9. Create a program for storing a week's worth of rainfall data. Use a list to store each day's value, entered sequentially by the user. When an entire week has been input, display the days with the minimum and maximum rainfall. Also compute average rainfall. 10. Write a program to generate a list of odd numbers from 0 to 100 using filter and list comprehension. 11. Write a program to get all possible unique subsets from a set of distinct integers. Input : [4, 5, 6] Output : [], [6], [5], [5, 6], [4], [4, 6], [4, 5], [4, 5, 6] 12. Write a program to print out a set containing all the colors from a list which are not present in another list
III	<ol style="list-style-type: none"> 1. A “wobbly” number is one in which the digits alternate between being higher (or lower) than the preceding one. Here are some wobbly numbers: 19284756242, 90909, 0909. Write a function that accepts a list of digits to be checked for wobbliness. If the sequence of digits is wobbly, the function should return True, otherwise False. 2. Write a function that converts an integer amount into words. For example, amount 121567 is “One lac twenty one thousand five hundred sixty seven” in words. Implement using tuple, list and dictionary to store words like “hundred”, “thousand” etc. 3. Write a function print_board that takes a list of lists as an argument and prints out a Tic-Tac-Toe board in the following format. Consider argument [['#', 'o', 'x'], ['#', '#', 'o'], ['x', '#', 'o']]. Here, # symbols represent blank squares on the board. <pre> o x ----- o ----- x o </pre>

	<ol style="list-style-type: none"> 4. Write a function that takes an integer amount in rupees and returns a dictionary having equivalent amount with smallest number of currency notes of rupees 1000, 500, 100, 50, 20, 10, 5, 2 and 1. For example, for input 21729, return value should be { 1000:21, 500:1, 100:2, 20:1, 5:1, 2:2}. Store currency notes in a tuple. 5. Write a function to compute the greatest common divisor (GCD) of two positive integers. 6. Implement a recursive as well as an iterative Python function that returns the sum of the first n integers. 7. Implement a recursive as well as an iterative Python function to generate numbers in the Fibonacci sequence. 8. Write a class Account that stores the current balance, balance date and account number of a bank account. Provide methods to withdraw, deposit and add interest to the account. The user should only be allowed to withdraw money up to some overdraft limit. If an account goes overdrawn, there is fee charged. Interest rate, overdraft limit rule and overdraft charge are same for all accounts. <p>Create a subclasses of Account class called CreditAccount in which the user is charged a set amount for every withdrawal that is made. If the user is overdrawn, the withdrawal charge is doubled.</p> <p>Create a subclasses of Account class called StudentAccount in which new accounts start off with a balance of Rs.500 and an overdraft of up to Rs.3000 is allowed, with no charges for withdrawal.</p>
IV	<ol style="list-style-type: none"> 1. Write a program that counts the number of times each word appears in the data file. 2. Write a program to store a list of contact names and telephone numbers in the data file. Extend the program to add new contacts. It should check for duplicate names and numbers. If the new contact's name is already in the database, the message "This person is already entered." should appear. If the telephone number is already in the database, the program should display "This person's telephone number is already in the database. This could be an error, or a second contact at the same company. Add anyway?" If the user enters "Y", the contact is added. 3. Calculating statistics such as maximum, minimum, mean and standard deviation is a common task. Create a package to provide such functionality. 4. Create a module for banking operations.
V	<ol style="list-style-type: none"> 1. Develop a web application for online shopping. (Consider payment on delivery) 2. Develop a web application for online admission process for an institute.

Teaching Methods:

The following pedagogical tools will be used to teach this course:

- 1 (1) Practical
- 2 (2) Assignments & Presentations
- 3 (3) Case Analysis

Evaluation:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

1.	Assignments / Presentations/ Quizzes / Class Participation etc.	30% (Internal Assessment)
2.	Internal Examination	20% (Internal Assessment)
3.	External Examination (University Exam)	50% (External Assessment)

Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
T1	Wesley Chun	Core Python Programming	Pearson Education,	Second edition, 2008
T2	Brad Dayley	Sams Teach Yourself Django in 24 hours	Pearson Education	2009

Reference URLs:

Sr No.	URL
1	docs.python.org/3/tutorial/
2	www.tutorialspoint.com/python/python_tutorial.pdf
3	www.cs.uky.edu/~keen/115/Haltermanpythonbook.pdf
4	docs.djangoproject.com/en/1.9/intro/
5	media.readthedocs.org/pdf/django/latest/django.pdf