



15ECAP706

Rich Internet Application Lab.

**Program: MASTER OF COMPUTER APPLICATIONS**

**Course Title: Rich Internet Applications Lab.**

**Course Code: 15ECAP706**

**L-T-P : 0-1-1**

**Credits: 2**

**Contact Hours: 4 hrs**

**CIE Marks: 80**

**SEE Marks: 20**

**Total Marks: 100**

**Teaching Hours: 48hrs**

**Examination Duration: 3Hrs.**

- 1)a) Write the program which describes Boolean data type.
- b) Write the program which describes integer, float and string data type.
- c) Write the program for type casting of different data type
  
- 2) Find the biggest of 2 numbers.  
Find the biggest of 3 numbers.  
Check whether a number is positive or negative.  
Find the biggest of two numbers using ternary operator.  
Check whether the given number is odd or even.  
Find the factorial of a number (while loop)  
Reverse the digit (Use do while)  
Find the sum of the digits (Use for loop)  
Display the Fibonacci series for a particular limit.(Use for loop)  
Check the given letter is vowel or not.
- 3) Create an associative array with book details and display it in a table.  
Write a program to create an array and try with all array functions.
- 4) Find the length of a string  
Create a form with one text field and submit buttons for string length, string, reverse, uppercase, lowercase, string replace . Display the result according to it.
- 5) Write a program of function passing a two values and add the two values in the function.  
Write a program of function showing with return value.  
Create a registration form which contains fields name, Roll No, Gender and a submit button.  
All the details should be displayed in the server page when the user clicks the submit button.  
Write a program to check whether the given number is prime or not.
- 6) Create Cookie, store a value "Ram" in the cookie.  
Write a program of Cookie showing expire of cookie
- 7) Write a program to display the contents of a file(use fread, fgets, fgetc)  
Write a program to create a file and write contents to it  
Write a program to append data to an existing file.  
Write a program to upload a file and display the contents in server.
- 8) Write a program for cinema ticketing. All the age should be over 12 years, if less than,dont allow to get ticket.( apply the exception handling



9) Write a PHP code to connect MySql Database.  
Write a PHP code to select data,delete data and update data with MySql.  
Working with MVC framework(joomla) using PHP and MySql.

15ECAP708

Web Services Lab

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **15ECAP708**

Course Title: **Web Services Lab.**

L-T-P: **0-1-1**

Credits: 2

Contact Hrs: **4**

ISA Marks: **80**

ESA Marks: **20**

Total Marks: **100**

Teaching Hrs: **48**

Exam Duration: **3 Hours**

**1) PHP**

**2) AJAX**

1. XMLHttpRequest Object
2. Creating a request object
3. Sending a request to server
4. Receiving a response from the server
5. Ready State and Status of a request

**3) JQUERY**

6. Introduction and Installation
7. Syntax
8. jQuery Selectors
9. jQuery Events
10. jQuery Effects
  - i. jQuery Hide and Show Effect
  - ii. jQuery Fade Effect
  - iii. jQuery Slide Effect
  - iv. jQuery Animate
1. jQuery Callbacks
2. jQuery and HTML
  - i. jQuery Get
  - ii. jQuery Set
  - iii. jQuery Add
  - iv. jQuery Remove
  - v. jQuery css
  - vi. jQuery Width



- vii. jQuery Height
- 3. jQuery and AJAX (Pre-Requisite: ServerEnd Technology)
  - i. AJAX Function
- 4. JQuery UI
  - i. Implementing Accordion
  - ii. Implementing Date picker
  - iii. Implementing Slider
  - iv. Implementing Progressbar
  - v. Implementing Tabs

**4) HTML 5**

- 1. Introduction
- 2. HTML5 New Elements
- 3. HTML5 Video
- 4. HTML5 Video/DOM
- 5. HTML5 Audio
- 6. HTML5 Drag and Drop
- 7. HTML5 Canvas
- 8. HTML5 SVG
- 9. HTML5 Canvas vs. SVG
- 10. HTML5 Geolocation

**5) BOOTSTRAP**

**6) GOOGLE MAPS API**

**Evaluation Scheme**

- 1. In Semester Assessment (ISA) : Continuous Internal Assessment for 80 Marks.**
- 2. End Semester Assessment (ESA) for 20 Marks.**

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **15ECAE802**

Course Title: **Information Storage and Management**

L-T-P: **3-0-0**

Credits: **3**

Contact Hrs: **3**

ISA Marks: **50**

ESA Marks: **50**

Total Marks: **100**

Teaching Hrs: **42**

Exam Duration: **3 Hours**



No	Content	Hrs
<b>Unit I</b>		
1	<b>Chapter 1: Introduction to Information Storage:</b> Information Storage, Evolution of storage architecture, Data Center Infrastructure, Virtualization and Cloud Computing. Data center environment: Application, DBMS, Host, Connectivity, Storage, Disk Drive Components, Disk Drive Performance, Host Access To Data, Direct Attached Storage, Storage Design Based on Application, disk native Command Queuing	6 Hrs
2	<b>Chapter 2 : Data protection: RAID</b> RAID Implementation Methods, RAID Array Components, RAID Techniques, Raid Levels, RAID Impact on Disk performance, RAID Comparison, HOT Spares	6 Hrs
3	<b>Chapter 3. Intelligent Storage Systems:</b> Components of an Intelligent storage system, LUN Masking, Types of Intelligent storage Systems	5 Hrs
<b>Unit II</b>		
4	<b>Chapter 4: Fibre Channel Storage Area Networks:</b> Fiber channel :Overview, Components of SAN, FC Connectivity, Switched Fabric ports, Fibre Channel Architecture, Zoning, FC SAN Topologies, Virtualization in SAN. IP SAN: iSCSI, FCIP.	7 Hrs
5	<b>Chapter 5: Network Attached Storage (NAS):</b> Components of NAS, NAS Implementations, NAS File sharing Protocols, Factors Affecting NAS Performance, File Level Virtualization.	5 Hrs
6	<b>Chapter 6: Content Addressed Storage(CAS) and Unified Storage</b> Object Based Storage Devices, Content Addressed Storage, Unified Storage	5 Hrs
<b>Unit – III</b>		
7	<b>Chapter 7: Local Replication and Remote Replication :</b> Local Replication Technologies, Remote Replication Technologies .	4 Hrs
8	<b>Chapter 8: Securing &amp; Managing the Storage Infrastructure</b> Information security Framework, Risk Traid, Storage Security Domains ,Monitoring the Storage Infrastructure, Storage Infrastructure Management activities, Storage Infrastructure Management Challenges.	4 Hrs
Text Book:		
1. G.Somasundaram, Aloka Shrivastava, “ EMC Education Services, Information Storage and Management”, Wiley, 2009.		
References:		
1. Foundations ULF Troppens, Rainer Erkens and Wolfgang Muller, “ Storage Networks Explained”, John Wiley & Sons, 2003.		
2. Robert Spalding, “ Storage Networks: The complete Reference”, Tata Mc Graw Hill, 2003.		



3. Richard barker and Paul Massiglia, " Storage Area Networks Essentials: Acomplete Guide to understanding and Implementing SANS", John Wiley India, 2002.
4. Marc Farely, " Building Storage Networking Fundamentals", Cisco press, 2005

**Evaluation**

**Scheme**

**1. In Semester Assessment (ISA)**

Assessment	Weightage in Marks
ISA- 1	20
ISA- 2	20
Assignments	10
<b>Total</b>	<b>50</b>

**2. End Semester Assessment (ESA)**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2,3	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4,5,6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7,8	Any 1 question is to be answered

15ECAP804

Advance DBMS Lab.

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **15ECAP804**

Course Title: **Advance DBMS Lab.**

L-T-P: **0-0-1.5**

Credits: **1.5**

Contact Hrs: **3**

ISA Marks: **80**

ESA Marks: **20**

Total Marks: **100**

Teaching Hrs: **36**

Exam Duration: **3 Hours**

**PL/SQL programs on :Strings, Arrays, Cursors, Records, Exceptions, Triggers, Packages, Collections, Transactions& Stored Procedures.**

**EXERCISE 1**

Write a PL/SQL code to retrieve the employee name, join\_date, and designation from employee database of an employee whose number is input by the user.



Employee database with the tables and fields specified as below.

a) Employee: 

<u>Emp_no</u>	Employee_name	Street	City
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b) Works : 

<u>Emp_no</u>	Company_name	Joining_date	Designation	Salary
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c) Company : 

<u>Emp_no</u>	City
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d) Manages : 

<u>Emp_no</u>	Maanager_name	Mang_no
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Note: Primary keys are underlined.

#### EXERCISE 2

Write a PL/SQL code to calculate total and percentage of marks of the students in four subjects.

#### EXERCISE 3

Write a PL/SQL code to calculate the total and the percentage of marks of the students in four subjects from the table- Student with the schema given below.

STUDENT ( RNO , S1 , S2, S3, S4, total, percentage)

#### EXERCISE 4

Write a PL/SQL code to display employee number, name and basic of 5 highest paid employees. (Usage of cursors)

#### EXERCISE 5

Write a PL/SQL code to calculate the total salary of first n records of emp table. The value of n is passed to cursor as parameter.

#### EXERCISE 6

Write a trigger on the employee table which shows the old values and new values of Ename after any updations on ename on Employee table

#### EXERCISE 7

Write a row trigger to insert the existing values of the salary table in to a new table when the salary table is updated.

#### EXERCISE 8

Write a PL/SQL procedure to find the number of students ranging from 70-100%, 60-69%, 50-59% & below 49% in each course from the student\_course table .

Student database with the tables and fields specified as below.

a) Student : 

<u>Roll_no</u>	Student_name	Course	Gender
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b) Student Personal:

Roll_no	DOB	Father_name	Address	Place
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c) Student enrollment :

Roll_no	Course	Course_code	Sem	TotalMarks	Percentage
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**EXERCISE 9**

Create a store function that accepts 2 numbers and returns the addition of passed values. Also write the code to call your function.

**EXERCISE 10**

Write a PL/SQL function that accepts department number and returns the total salary of the department. Also write a function to call the function.

**EXERCISE 11**

Write a PL/SQL code to create:

- a) Package specification
- b) Package body.

For the insert, retrieve, update and delete operations on a student table.

**EXERCISE 12**

**Extending the power of PL/SQL:**

This experiment shows how to call a PL/SQL subprogram from a Java program. It's aimed at those PL/SQL programmers who have no previous experience of Java, and those Java programmers who have no previous experience of PL/SQL (to call Java from PL/SQL).

**Evaluation**

**Scheme**

- 1. In Semester Assessment (ISA) : Continuous Internal Assessment for 80 Marks.**
- 2. End Semester Assessment (ESA) for 20 Marks.**

17ECAP702

Web Programming Lab.

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **17ECAP702**

Course Title: **Web Programming Lab.**

L-T-P:**0-0-1.5**

Credits: **1.5**

Contact Hrs: **3**

ISA Marks: **100**

ESA Marks: **--**

Total Marks: **100**



Teaching Hrs: 36

Exam Duration: 3 Hours

**No** **Content** **Hrs**  
**Unit I**

**Laboratory Section**

<i>Expt./ Job No.</i>	<i>Lab assignments/experiment</i>	<i>No. of Lab. Slots per batch (estimate)</i>
<b>Demonstration</b>		
1-2	Web designing using all elements of HTML and HTML5.	02
3	Applying CSS and CSS3 to HTML pages	01
4-5	Client side scripting using JavaScript	02
<b>Exercises</b>		
6-7	Exercise programs on Web designing using all elements of HTML and HTML5.	02
8	Exercise programs on Applying CSS and CSS3 to HTML pages	01
9-10	Exercise programs on Client side scripting using JavaScript	02
<b>Structured enquiry</b>		
11	Develop a customized web based application.	02

17ECAC703

PHP Programming

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **17ECAC703**

Course Title: **PHP Programming**

L-T-P:**3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks Theory: **50 + Practice: 100**

ESA Marks: **50**

Total Marks: **200**





Teaching Hrs: 42 + 24

Exam Duration: 3 Hours

No	Content	Hrs
<b>Unit I</b>		
1	<b>Chapter No. 1- Introducing PHP</b> History, Unique features, Basic development concepts , Creating your first PHP script, Writing & running the script, Understanding the scripts , Handling script errors	3 Hrs
2	<b>Chapter No. 2- Using variables &amp; operators</b> Storing data in variables, Understanding PHP's data types, Setting & checking variable data types, Using constants, Manipulating variables with operators, Handling form input	3Hrs
3	<b>Chapter No. 3- Controlling Program Flow</b> Writing Simple Conditional Statements, Writing More Complex Conditional Statements , Combining Conditional Statements, Repeating actions with loops, Working with string & numeric functions	4Hrs
4	<b>Chapter No. 4- Working with Arrays</b> Storing data in Arrays, Processing arrays with loops & iterators, Using arrays with forms, Using arrays with forms, Working with array functions, Working with dates & times.	3Hrs
5	<b>Chapter No. 5- Using functions &amp; Classes</b> Creating user defined function, Creating classes ,Using Advanced OOP concepts	4Hrs
<b>Unit II</b>		
6	<b>Chapter No. 6. Working with Files &amp; Directories</b> Reading files, Writing files , Processing directories , Performing Other files & directory operations	6 Hrs
7	<b>Chapter No. 7. Working with databases &amp; SQL</b> Introducing databases & SQL, Using PHP MySQLi extension, Adding or modifying data, Handling errors , Using PHP's PDO extension, Building a Login form	6 Hrs
8	<b>Chapter No. 8. Working with XML</b> Introducing XML, Using PHP's Simple XML extension, Converting XML to SQL, Reading RSS feeds ,Using PHP's DOM extension, Recursively processing an XML document tree	5Hrs
<b>Unit – III</b>		
9	<b>Chapter No. 9. Working with Cookies, Sessions &amp; Headers</b> Working with Cookies ,Cookie Basics , Cookie Attributes , Cookie Headers , Setting Cookies ,Reading Cookies , Removing Cookies, Working with Sessions , Session Basics , Creating Sessions and Session Variables , Removing Sessions and Session Variables, Using HTTP headers	4Hrs



**10 Chapter No. 10. Securing PHP**

**4Hrs**

Sanitizing Input and Output , Securing Data , Securing Configuration Files, Securing Database Access , Securing Sessions , Validating User Input, Working with Required Fields , Working with Numbers , Working with Strings , Working with Dates

**Text Books :**

1. VikramVaswani, A Beginner's Guide PHP, Mc Graw Hill, 2009.

References:

1. Online tutorials websites - w3schools and tutorialspoint

**Laboratory Section**

<i>Expt./ Job No.</i>	<i>Lab assignments/experiment</i>	<i>No. of Lab. Slots per batch (estimate)</i>
<b>Demonstration</b>		
1	Scripts that helps to understand the syntax and grammar of PHP language.	01
2	Scripts to develop dynamic web pages that read and process the user input submitted via online form.	01
3	Scripts to Develop dynamic web pages that store and retrieve data from a file on a disk and database from the server	01
4	Scripts to Develop dynamic web pages that authenticate and track users with sessions and cookies	01
5	Scripts to Perform efficient exception handling and error processing on the developed web pages	01
6	Scripts to demonstrate Database Communication through PHP	01
<b>Exercises</b>		
7	Practice Scripts on developing dynamic web pages that read and process the user input submitted via online form	01
8	Practice Scripts on Developing dynamic web pages that store and retrieve data from a file on a disk and database from the server	01
9	Practice Scripts on Develop dynamic web pages that authenticate and track users with sessions and cookies	01



10	Practice Scripts on Performing efficient exception handling and error processing on the developed web pages	01
11	Practice Scripts on demonstrating Database Communication through PHP	01
<b>Structured enquiry</b>		
12	Develop dynamic, interactive and customized web portals	01

### Evaluation Scheme

#### 1. Assessment

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

#### 2. End Semester Assessment (ESA) Pattern:

UNIT	8 Questions to be set of 20 Marks each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2,3,4,5	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	6,7,8	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	9,10	Any 1 question is to be answered

16ECAP804

Programming in C# with .NET Lab.

#### Program: MASTER OF COMPUTER APPLICATIONS

Course Code: **16ECAP804**

Course Title: **Programming in C# with .NET Lab.**

L-T-P:**0-0-1.5**

Credits: **1.5**

Contact Hrs: **3**

ISA Marks:**100**

ESA Marks: **00**

Total Marks: **100**



Teaching Hrs: 36

Exam Duration: 3 Hours

**No** **Content** **Hrs**  
**Unit I**

Expt/Job No.	Brief description about the experiment / job	No. of Lab. Slots per batch (estimate)
<b>Demonstration</b>		
1.	C# programming constructs Arrays, Strings, Enumerations, Structures, Methods and Namespaces.	1
2.	Pillars of OOP - Encapsulation, Inheritance, Polymorphism.	1
3.	Interfaces & members of Systems.Collections namespace.	1
4.	Delegates, Events & Operator Overloading.	1
<b>Exercises</b>		
5.	Implementation of boxing & unboxing techniques, methods and Parameter Modifiers.	1
6.	Application of basic OOP concepts and ArrayList class.	1
7.	Building Structures in C#.	1
8.	Implementation of encapsulation, inheritance and polymorphism in C#.	1
9.	Implementation of interfaces.	1
10.	Operator Overloading and Exception handling.	1
11.	Building Delegates in C#.	1
<b>Structured Enquiry</b>		
12.	Designing a C# GUI application with database connection.	1

16ECAP805

PL - SQL Lab.

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **16ECAP805**

Course Title: **PL / SQL Lab.**

L-T-P: **0-0-1.5**

Credits: **1.5**

Contact Hrs: **3**

ISA Marks: **100**

ESA Marks: **00**

Total Marks: **100**

Teaching Hrs: **36**

Exam Duration: **3 Hours**



<i>Expt No.</i>	<i>Brief description about the experiment</i>	<i>Remarks</i>
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**Demonstration**

- |   |                                                  |               |
|---|--------------------------------------------------|---------------|
| 1 | Introduction to basic PL/SQL control structures. | No-Evaluation |
| 2 | Introduction to Functions                        | No-Evaluation |
| 3 | Introduction to Procedures                       | No-Evaluation |
| 4 | Introduction to cursers and curser variables.    | No-Evaluation |
| 5 | Introduction to Triggers and records.            | No-Evaluation |

**Exercise**

- |    |                                                                       |            |
|----|-----------------------------------------------------------------------|------------|
| 6  | Implementation of basic PL/SQL control structures on a given database | Evaluation |
| 7  | Implementation of PL/ SQL Functions on a given database               | Evaluation |
| 8  | Implementation of Procedures on a given database.                     | Evaluation |
| 9  | Implementation of Cursors and curser variables on a given database.   | Evaluation |
| 10 | Implementation of Triggers on a given database.                       | Evaluation |
| 11 | Implementation of Records on a given database.                        | Evaluation |

**Structured Enquiry**

- |    |                                                           |            |
|----|-----------------------------------------------------------|------------|
| 12 | Implementing a PL/SQL operations on a real time data base | Evaluation |
|----|-----------------------------------------------------------|------------|

**Evaluation Scheme**

**1. In Semester Assessment (ISA): Continuous Internal Assessment for 100 Marks.**

16ECAE802

NO SQL

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **16ECAE802**

Course Title: **NoSQL**

L-T-P: **3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks-Theory: **50** +Practice: **100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **50**

Exam Duration: **3 Hours**

**No**

**Content**

**Hrs**

**Unit I**



<b>1</b>	<b>Chapter 1 – Introduction to NoSQL</b> What it is & Why you need it, Hello NoSQL : Getting Initial hands-on Experience, Interfacing and Interacting with NoSQL	<b>8 Hrs</b>
<b>2</b>	<b>Chapter 2 – NoSQL Basics</b> Understanding the Storage Architecture, Performing CRUD operations, Querying NoSQL Stores, Modifying Data Stores & Managing Evolution, Indexing and ordering datasets.	<b>12Hrs</b>
<b>Unit II</b>		
<b>3</b>	<b>Chapter 3 – Advanced NoSQL</b> Using NoSQL in the CLOUD, Scalable Parallel Processing with MapReduce, Analyzing BigData with Hive.	<b>8 Hrs</b>
<b>4</b>	<b>Chapter 4 – Working with NoSQL</b> Surveying Database Internals, Using MySQL as a NoSQL solution, WebFrameworks and NoSQL, Migrating from RDBMS to NoSQL.	<b>12 Hrs</b>
<b>Unit – III</b>		
<b>5</b>	<b>Chapter 5 – Developing Web Application with NoSQL</b> Php and MongoDB – Comparing documents in MongoDB & PHP, MongoDB classes, Connecting & Disconnecting, Inserting Data, listing your data, Modifying data with PHP, Deleting data, DBRef, GridFS & PHP Driver, Creating a Blog Application with PHP driver - Designing the Application, Listing the Posts, Looking at a Single Post, Searching the Psots, Adding, Deleting & modifying Posts, Creating the Index Pages, Recapping the blog application.	<b>6 Hrs</b>
<b>6</b>	<b>Chapter 6 – NoSQL Database Administration</b> Using Administrative tools, Backing up the MongoDB Server, Digging Deeper into Backups, Restoring Individual Databases or Collections, Automating Backups, Backing up Large Databases, Importing Data into MongoDB, Exporting data into MongoDB, Securing.	<b>4 Hrs</b>



Text Book:

1. "Professional NoSQL" by Shashank Tiwari, 2011, WROX Press (Chapter 1,2,3,4,5,6,7,8,9,10,11,12,13,15)
2. The Definitive guide to MongoDB, The NoSQL Database for Cloud and Desktop Computing, Apress 2010. (Chapter 6,7,8,9).

**NOSQL PRACTICES**

**COURSE DESCRIPTION:**

The widespread emergence of big data storage needs has driven the development and adoption of a new class of non - relational databases commonly referred to as NoSQL databases. The NoSQL (or Not-Only SQL) databases are basically developed to meet the requirements of the modern cloud-based decentralized apps and are a good solution as compared to the relational databases in many ways. These unstructured databases are widely known for their non-relational and schema less data model, improved performance and scalability factors which are always an issue with relational database systems. This course will explore the origins of NoSQL databases and the characteristics that distinguish them from traditional relational database management systems. Core concepts of NoSQL databases will be presented followed by an exploration of how different database technologies implement these core concepts.

**OBJECTIVES**

- o Demonstrate competency in designing NoSQL database management systems.
- o Demonstrate competency in describing how NoSQL databases differ from relational databases from a theoretical perspective.
- o Demonstrate competency in selecting a particular NoSQL database for specific use cases.

**LAB REQUIREMENTS:**

- o Computer with latest configuration having Windows and Unix OS Versions.
- o Java software installed.

**LIST OF EXERCISES**

Expt./ Job No.	Lab assignments/experiment	Implementation	Number of Hours
1.	Set up MongoDB environment.	i. Installation of MongoDB on Windows and Unix platform. ii. Operations on Start, Stop and Restart MongoDB. iii. Using MongoDB Help. iv. Getting MongoDB Statistics.	02
2.	Create/Drop, NoSQL Datatypes	i. Differentiate between database, document and collection. ii. Create Database, Drop Database. iii. Create Collection, Drop Collection. iv. MongoDB Datatypes.	02
3.	Working with MongoDB Documents	Insert Document, Update Document, Delete Document,	02
4.	Data Retrieval	i. Projection ii. Limit Records iii. Sort Records iv. Indexing v. Aggregation	02
5.	Creating Backup	i. Replication ii. Sharding iii. Create Backup	02



		iv. Deployment	
6.	MongoDB in Java	Set up MongoDB JDBC driver, Connect to database, Create a Collection, Retrieve a Collection, Insert a Document, Retrieve a Documents, Update Document.	04

References:

- [https://www.tutorialspoint.com/mongodb/mongodb\\_tutorial.pdf](https://www.tutorialspoint.com/mongodb/mongodb_tutorial.pdf)
- [https://blog.codecentric.de/files/2012/12/MongoDB-CheatSheet-v1\\_0.pdf](https://blog.codecentric.de/files/2012/12/MongoDB-CheatSheet-v1_0.pdf)
- <http://www.guru99.com/mongodb-tutorials.html>

**Evaluation Scheme**

**1. Assessment**

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

**2. End Semester Assessment (ESA) Pattern:**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	3,4	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	5,6	Any 1 question is to be answered

16ECAE803

Database Administration

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **16ECAE803**

Course Title: **Database Administration**

L-T-P:**3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks-Theory: **50** +Lab: **100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **50**

Exam Duration: **3 Hours**

No	Content	Hrs
<b>Unit I</b>		
<b>1</b>	<b>Chapter No. 1 : Introduction</b> Why Learn Database Administration?, A Unique Vantage Point, The Management Discipline of Database Administration, Evaluating a DBA Job Offer, Database, Data and System Administration, DBA Tasks, DBMS Release Migration, Types of DBAs.	<b>7 Hrs</b>
<b>2</b>	<b>Chapter No. 2: Creating the Database Environment</b> Defining the Organization's DBMS Strategy, Installing the DBMS, Upgrading DBMS Versions and Releases, Database Standards and Procedures.	<b>7 Hrs</b>
<b>3</b>	<b>Chapter No. 3: Database Change Management</b>	<b>6 Hrs</b>





Change management Requirements, Types of changes, Impact of Change on Database Structures,

**Unit II**

<b>4</b>	<b>Chapter No. 4 Performance Management</b> Defining Performance, Monitoring versus Management, Service-Level Management, Types of performance tuning, Performance Tuning tools, DBMA performance Basics.	<b>7 Hrs</b>
<b>5</b>	<b>Chapter No. 5 System and Database Performance</b> The Larger Environment, DBMS Installation and Configuration Issues, System Monitoring, Techniques for optimizing Databases, Database reorganization.	<b>7 Hrs</b>
<b>6</b>	<b>Chapter No. 6 Application Performance</b> Designing Applications for Relational Access, Relational Optimization, Additional Optimization Considerations, Reviewing Access Paths, SQL Coding and Tuning for Efficiency.	<b>6 Hrs</b>

**Unit – III**

<b>7</b>	<b>Chapter No. 7 Database Security</b> Data Breaches, Database Security Basics, Granting and Revoking Authority, Authorization Roles and Groups, Other Database Security Mechanisms, Encryption.	<b>5 Hrs</b>
<b>8</b>	<b>Chapter No. 8 Database Backup and Recovery</b> The Importance of Backup and Recovery, Preparing for Problems, Backup, Recovery, Alternatives to Backup and Recovery	<b>5 Hrs</b>

Text Book:

- Craig S. Mullins "Database Administration: The complete guide to DBA Practices and Procedures" 2<sup>nd</sup> Edition, Addison Wesley.

**Evaluation Scheme**

**1. Assessment**

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

**2. End Semester Assessment (ESA) Pattern:**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2,3	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4,5,6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7,8	Any 1 question is to be answered



Course Code: **16ECAE804**

Course Title: **Web Content Management**

L-T-P:**3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks-Theory: **50** +Lab: **100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **50 + 24**

Exam Duration: **3 Hours**

No	Content	Hrs
<b>Unit I</b>		
<b>1</b>	<b>Chapter 1: What Content Management Is (and Isn't)</b> What Is Content?, What Is a Content Management System?, Types of Content Management Systems, What a CMS Does, What a CMS Doesn't Do	<b>6 Hrs</b>
<b>2</b>	<b>Chapter 2 :Points of Comparison</b> Target Site Type, Systems Versus Implementations, Platform Versus Product, Open Source Versus Commercial, Technology Stack, Management Versus Delivery, Coupled Versus Decoupled, Installed Versus Software-as-a-Service (SaaS), Code Versus Content, Code Versus Configuration, Uni- Versus Bidirectional Publishing, Practicality Versus Elegance, and the Problem of Technical Debt	<b>7 Hrs</b>
<b>3</b>	<b>Chapter 3 :Acquiring a CMS</b> Open Source CMSs, Commercial CMSs, Software-as-a-Service, Build Your Own, Questions to Ask	<b>7 Hrs</b>
<b>Unit II</b>		
<b>4</b>	<b>Chapter 4: The Content Management Team</b> Editors, Site Planners, Developers, Administrators, Stakeholders	<b>7 Hrs</b>
<b>5</b>	<b>Chapter 5: CMS Feature Analysis</b> The Difficulties of Feature Analysis, An Overview of CMS Features	<b>6 Hrs</b>
<b>6</b>	<b>Chapter 6 Content Modeling</b> Data Modeling 101, Data Modeling and Content Management, Separating Content and Presentation, Defining a Content Model, Relationships, Content Composition, Content Model Manageability, A Summary of Content Modeling Features	<b>7 Hrs</b>
<b>Unit – III</b>		
<b>7</b>	<b>Chapter 7 :Content Aggregation</b> The Shape of Content, Content Geography, Aggregation Models: Implicit and Explicit, Aggregation Functionality, By Configuration or by Code, A Summary of Content Aggregation Features	<b>5 Hrs</b>
<b>8</b>	<b>Chapter 8 :Editorial Tools and Workflow</b> The Content Lifecycle, The Editing Interface, Versioning, Version Control, and Version Labels, Dependency Management, Content Scheduling and Expiration, Workflow and	<b>5 Hrs</b>



Approvals, Collaboration, Content File Management, Permissions, A Summary of Editorial Tools

Text Book:

1. "Web Content Management", Systems, Features, and Best Practices, Publisher: O'Reilly Media, March 2016.

### WEB CONTENT MANAGEMENT SYSTEM – COURSE PROJECT

#### COURSE DESCRIPTION:

Today, many web publishers use content management systems (CMS) to allow them to instantly and dynamically update web pages and properties as new content becomes available so that every visit to a site is engaging, informative, and meaningful. The course project shall explore any one of the three most popular open source web-based content management systems—**WordPress, Joomla, and Drupal**—to create dynamic and flexible websites and landing pages. Students shall explore the fundamentals of planning dynamic websites, CMS database management, developing CSS-controlled site templates, and creating database-driven websites through the planning and creation of their own topic-based sites.

#### OBJECTIVES

- Introduce learners to any one of the three most popular open source content management systems (CMS) such as WordPress, Drupal, or Joomla.
- Create, deploy and Maintain websites using CMS, including creating and editing content, adding functionality, and creating custom templates and themes.

#### COURSE PROJECT TITLE: BUILDING WEBSITE USING CMS (Joomla / WORDPRESS OR DRUPAL)

To build website for any real world examples such as Corporate web sites or portals, Online magazines, newspapers, and publications, E-commerce and online reservations, Government applications, Small business web sites, Community-based portals, School, religious web sites or Personal or family homepages using popular Web Content Management System. The website shall facilitate to create, manage, store and deploy content on the Web, including text, graphics, video or audio as a part of Enterprise Content Management.

#### EXECUTION PLAN:

Sl.No	Demonstration	Implementation	Number of Slots
1.	<b>Introducing Content Management Systems</b> <ul style="list-style-type: none"> <li>○ An overview of some of the different tools and methods that today's web publishers are using to create highly-tailored dynamic web content.</li> <li>○ Purchasing and configuring a domain name and web hosting.</li> </ul>	<ol style="list-style-type: none"> <li>1. Introduction to Joomla &amp; Installation</li> <li>2. Domain Name Registration &amp; Configuration and Hosting</li> <li>3. Create a Database</li> <li>4. Content Preparation and Planning</li> </ol>	02



2.	<p><b>Introduction to Joomla</b></p> <ul style="list-style-type: none"> <li>○ Explore the CAM model (Categories, Articles, and Menus) approach to creating content for Joomla environments.</li> <li>○ Administration and management of users and media.</li> <li>○ Installing Joomla</li> <li>○ Exploring the Admin Interface</li> <li>○ Content creation using the CAM model</li> <li>○ Content customization: images, video, audio, tags, formats, etc.</li> </ul>	<ol style="list-style-type: none"> <li>1. Write an article &amp; put your articles in order with categories.</li> <li>2. Customize Administrator's Panel</li> <li>3. Change your website's look with Templates.</li> <li>4. Expand your website's functionality with different extensions.</li> <li>5. Content creation &amp; Customization using the CAM model</li> </ol>	02	
3.	<p><b>Joomla Menus</b></p> <ul style="list-style-type: none"> <li>○ Creating and controlling menus for Joomla site.</li> <li>○ To link to articles and create special menu items.</li> <li>○ Adding and displaying menus</li> <li>○ Linking menus to articles and other features</li> </ul>	<ol style="list-style-type: none"> <li>1. Categorize the articles which allow grouping your content better.</li> <li>2. Create menu items for website.</li> </ol>	02	
4.	<p><b>Extending Joomla –Plug-ins, Modules</b></p> <ul style="list-style-type: none"> <li>○ Use of Joomla, Plug-ins, Modules, Components and other extensions.</li> <li>○ Installation of extensions, Finding and adding Joomla extensions</li> <li>○ Adding and setting up 2 “big” extensions (choose blog, calendar, image gallery, Paypal-based shopping cart, or portfolio. Other extensions on approval )</li> </ul>	<p>Select Create Joomla Modules for the website such as Feed Display Module, Footer Module, Latest News Module, Search Module, Random Image Module, Who's Online Module etc.</p>	02	
5.	<p><b>Custom Templates</b></p> <ul style="list-style-type: none"> <li>○ Explore the addition of creation and uses of customized Joomla templates</li> <li>○ Modifying templates using CSS and HTML tricks.</li> </ul>	<p>Select and Customize template for website.</p>	02	
6.	<p><b>User management and permissions</b></p> <ul style="list-style-type: none"> <li>○ Explore how to manage users in Joomla site, including managing who sees what based on login, as well as who can do what based on permissions assigned.</li> </ul>	<p>Control the use of Captcha, registration allowed and type of registration, default user group new users, reset password, and new user registration email notice to administration.</p>	02	



### Evaluation Scheme

#### 1. Assessment

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

#### 2. End Semester Assessment (ESA) Pattern:

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2,3	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4,5,6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7,8	Any 1 question is to be answered

16ECAE807

IT Infrastructure & Management

#### Program: MASTER OF COMPUTER APPLICATIONS

Course Code: 16ECAE807

Course Title: IT Infrastructure Management

L-T-P:3-0-1

Credits: 4

Contact Hrs: 5

ISA Marks-Theory: 50 +Lab: 100

ESA Marks: 50

Total Marks: 200

Teaching Hrs: 50

Exam Duration: 3 Hours

No	Content	Hrs
	<b>Unit I</b>	
1	<b>Chapter 1. Introduction</b> Basic Conceptual Overview of Router, Routing Protocols and Routed Protocols & Conceptual Overview of the concept of Zoning, Internet, Extranet, Intranet (Military Zone), De-Military Zones.	5 Hrs
2	<b>Chapter 2. IT Infrastructure Components and their associated Zones</b> Firewall , IPS (Intrusion Prevention System) , VPN (Virtual Private Network), NATing, Servers-Domain Name System Server, Proxy Server, Web Application Server, DHCP Server, FTP Server, Mail Server	5 Hrs
3	<b>Chapter 3. Firewall :</b>	5 Hrs



Basic Operation of Firewall, Types of Firewall-Stateless-Static Packet Filtering Firewall, Stateful-Dynamic Filtering Firewall, Firewall Rule Set-Conceptual Overview, Standard Firewall Rules, How to Create a Firewall Rule ;Windows Firewall -Configuration of a Windows Based Firewall on PC, Host Based Firewall, Security Products ;Modern Firewall Architecture- Deep Packet Inspection; Essence of a Firewall in the Corporate IT Infrastructure- How it protects the Servers in the Corporate Infrastructure; Protection to Corporate IT Infrastructure in absence of a Firewall.

**4 Chapter 4. IPS (Intrusion Prevention System) 5 Hrs**

What is an IPS Device, Uses of IPS Device, Modes of Operation of IPS Device, IPS Device Update Mechanism, Advantages of IPS Device, Disadvantages of IPS Device

**Unit II**

**5 Chapter 5. VPN (Virtual Private Network) 10Hrs**

Leased Line Network and the Advnet of VPN, What is VPN (Virtual Private Network? How VPN can be Helpful? How does VPN Work? Types of VPN - Remote Access, VPN Tunneling, Equipments to set up VPN Connectivity, VPN Case let – Challenge, VPN Technology - SSL VPN and IPsec VPN, Encryption and Security Protocols in VPN, Advantages of VPN, VPN Related Threats- End Point Security Posture , Split Tunneling- Concept, Advantages, Configuration, ICS Split Tunneling Problem, Web Application Attacks, Unauthorized Access to Host, Insecure Storage of Authentication Credentials by VPN Clients, Misconfiguration, RSA - VPN Implementation, Setting Client Based VPN Connection

**NATing-** Conceptual Overview, NATing Operation - How it works? Applications of NATing

**6 Chapter 6. Domain Name System Server- 10Hrs**

Conceptual Overview, DNS Hierarchical Structure, Distributed Database- Top Level Domains Classification - Geographical and organizational, Fully Qualified Domain Name; DNS Server Classification - Zone Information/ Function, DNS Operation Modes - Recursive and Iterative, DNS Caching-a. Conceptual Overview, How DNS Resolves Queries; DNS Records - A, AAAA, MX, NS, PTR, CNAME-Registering DNS Records in Corporate/ ISP DNS Servers; DNS Zone Files, DEMO:nslookup utility -Command Line tool for forward DNS query, Reverse DNS Queryand Extracting Domain Related Information; DNS Threats and Mitigation- Split Zone Architecture, Zone Information Leakage -Unauthorized Zone Zone Transfer, Reverse DNS Lookup, Zone Transfers Applications to keep DNS updated, Security Zone Transfers using DNS/ TSIG, Security Zone Transfers using DNSSEC (DNS Security) Protocol- How DNSSEC Works? Difference between DNS TSIG and DNSSEC; Cache Poisoning Attack, Conceptual Overview - How it happens, Implications- Mail Redirection, Web Redirection, URL Redirection; Deletion Attack, DoS Attack-Demo:DoS Attack on a DNS Server, Dynamic Updates using DHCP Client/ Server, Integrated with ADS, Wrong Configuration - Non-Authoritative, Recursive Mode, Integrity Compromise of ROOT Hints File, DNS Amplification Attacks, Other Security Parameters- Restrict DNS servers to listen on specific addresses, Configure Global Query Block List.

**Unit – III**

**7 Chapter 7. Proxy Server- Conceptual Overview, Operation - How Proxy Server Works , 5 Hrs Applications of Proxy Server; Antivirus - Types of Malwares - Virus, Worms, Trojans, Spyware,**



Ghostware, RansomWare etc., What is an Antivirus- How does an Antivirus Work? **Web Application Server**- Conceptual Overview, Web Application Attacks

**8 Chapter 8. DHCP Server** -Conceptual Overview, Overview of DHCP Operation, Uses of DHCP **5 Hrs**  
Server; **FTP Server**- Conceptual Overview, FTP Operations - Active and Passive FTP, Uses of FTP Server; **Mail Server**- Conceptual Overview, Overview of Email Filter Devices.

References:

1. Kemp, Juliet, Spinger, "Linux System Administration"
2. Anita Sengar "IT Infrastructure Management" 2012 Edition, publisher: S K Kataria and Sons
3. Sjaak Laan "Infrastructure Architecture - Infrastructure Building Blocks and Concepts Second Edition, Kindle Edition, Lulu Press Inc; Second Edition

**IT Infrastructure Management Practices**

**COURSE DESCRIPTION:**

IT infrastructure consists of a set of physical devices and software applications that are required to operate the entire enterprise. IT infrastructure is also consists both human and technical capabilities. These services include the following- Computing platforms used to provide computing services, that connect employees, customers, and suppliers into a coherent digital environment, including servers ,Data management services that store and manage corporate data and provide capabilities for analyzing the data and Application software services that provide enterprise-wide capabilities such as enterprise resource planning, customer relationship management, supply chain management, and knowledge management systems that are shared by all business units. It allows an organization to deliver IT solutions and services to its employees, partners and/or customers and is usually internal to an organization and deployed within owned facilities.

**OBJECTIVES**

- Acquire comprehensive knowledge, technical expertise and hands-on experience in IT Infrastructure Management
- To learn all aspects of IMS such as Networking, Operating Systems, Virtualizations and Data Center technologies.

**LAB REQUIREMENTS:**

- A modern web-browser with HTML5 and JavaScript enabled.
- Remote Desktop Client connection software.
- Internet connectivity Microsoft Account (LiveID).

**LIST OF EXERCISES**

<b>Expt./ Job No.</b>	<b>Lab assignments/experiment</b>	<b>Implementation</b>	<b>Number of Slots</b>
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1.	Web Server	Apache Web Server, IIS Server: Install and Configure the Apache Web Server on Linux and IIS server on windows.	01
2.	Samba Server	Implementation of Windows files and print services for Linux allowing the sharing of files and printers between Windows and Linux.	01
3.	LDAP Server	LDAP Server: Lightweight Directory Access Protocol- Server Installation to access a directory service.	01
4.	Mail Server	Mail Server configuration- POP3 Server, IMAP Server	01
5.	Proxy Server	Develop a small web proxy server, which is able to cache web pages. It is a very simple proxy server which only understands simple GET-requests, but is able to handle all kinds of objects - not just HTML pages, but also images.	01
6.	Firewalls and NAT (Network Address Translation)	Use of iptables to build a permissive firewall by selectively filtering packets based on protocol type.  To demonstrate how addresses may be translated from private addresses to public and vice versa as they pass in and out of the firewall.	01
7.	Cloud Infrastructure: Azure Hands-on Lab (HOL) Build your Infrastructure in the Cloud using Windows Azure Infrastructure Services -	1. Login to the Windows Azure Management Portal, Define a new Windows Azure Affinity Group and Create a new Windows Azure Storage Account. 2. Register a DNS Server in Windows Azure. 3. Define a Virtual Network in Windows Azure. 4. Configure Windows Server Active Directory in a Windows Azure VM. 5. Configure New Machine for File Services in a Windows Azure VM.	01

**References:**

- <https://amizone.net/AdminAmizone/WebForms/Academics/NewSyllabus/194201472058683.pdf>
- <http://itproguru.com/azurehol/#sthash.HMydlzVA.dpuf>
- <https://simms-teach.com/docs/cis192/cis192lab08.pdf>
- <https://simms-teach.com/resources.php>
- [http://www.cs.rpi.edu/~kotfid/security1/PDF2/NS1\\_lab\\_6\\_1\\_4\\_en.pdf](http://www.cs.rpi.edu/~kotfid/security1/PDF2/NS1_lab_6_1_4_en.pdf)
- <http://www.cse.unsw.edu.au/~cs3331/12s1/Labs/>
- <https://www.6diss.org/workshops/ca/dns-practical.pdf>
- <http://www.dwaynewhitten.com/info306/pages/lab.html>
- [http://www.bo.ingv.it/~scacciag/home\\_files/teach/netadminguide.pdf](http://www.bo.ingv.it/~scacciag/home_files/teach/netadminguide.pdf)
- <https://techpolymath.com/2015/02/16/how-to-setup-a-dns-server-for-a-home-lab-on-ubuntu-14-04/>
- <http://www.dwaynewhitten.com/info306/lab2.pdf>

**Evaluation Scheme**

**1. Assessment**

Assessment	Theory	Lab.
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ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

**2. End Semester Assessment (ESA) Pattern:**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2, 3, 4	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	5, 6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7, 8	Any 1 question is to be answered

15ECAP901

Big Data Analytics Lab.

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **15ECAP901**

Course Title: **Big Data Analytics Lab.**

L-T-P:**0-0-1**

Credits: **1**

Contact Hrs: **2**

ISA Marks:- **100**

ESA Marks: --

Total Marks: **100**

Teaching Hrs: **24**

Exam Duration: **3 Hours**

No	Content	Hrs
1.	Installation of R and RStudio	
2.	Demonstration of R programing.	
3.	Demonstration of data handling in R	
	Write R programs for following:	
4.	Compute measures of central tendency and dispersion for a given data.	
5.	Demonstrate data visualization using histogram, bar/line chart, boxplot and scatter plot for given data.	
6.	Demonstrate predictive analysis using regression	
7.	Demonstrate clustering using k-means.	



8. Demonstrate classification using KNN, decision tree, Bayesian classifier and random forest.

9. Demonstrate time series analysis using moving average, ARMA and ARIMA techniques.

Note:

Test the R programs using publicly available data sets in the websites. The data can be numeric or text.

15ECAP902

Advance Java Programming Lab.

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **15ECAP902**

Course Title: **Advance Java Programming Lab.**

L-T-P:**0-0-1**

Credits: **1**

Contact Hrs: **2**

ISA Marks:- **100**

ESA Marks: **00**

Total Marks: **100**

Teaching Hrs: **24**

Exam Duration: **3 Hours**

**No**

**Content**

**Hrs**

**Unit I**

<b>Expt No.</b>	<b>Brief description about the experiment</b>	<b>Slots</b>
<b>DEMONSTRATION</b>		
1	Introduction to Session management in JSP.	1
2	Introduction to Java Beans.	
3	Introduction to RMI.	1
4	Introduction to Struts Action class and Action Form class	1
5	Introduction to Springs.	1
6	Introduction to ORM	1
<b>EXERCISE</b>		



7	Implementation of session management in JSP application.	1
8	Implementation of Java Bean application	1
9	Implementation of RMI application.	1
10	Implementation of Springs application.	1
11	Implementation of ORM using Hibernate.	1
<b>STRUCTURED ENQUIRY</b>		
12	Design and Develop Java Web application using Spring and Hibernate framework.	2

15ECAE901

Internet of Things

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **15ECAE901**

Course Title: **Internet of Things**

L-T-P:**3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks-Theory: **50** +Lab: **100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **50+ 24**

Exam Duration: **3 Hours**

No	Content	Hrs
<b>Unit I</b>		
<b>1</b>	<b>Chapter No. 1.Introduction to Internet of Things (IoT)</b> Definition & Characteristics of IoT, Physical Design of IoT: IoT protocols, Logical Design of IoT: IoT functional blocks, communication models and APIs.	<b>6 Hrs</b>
<b>2</b>	<b>Chapter No. 2. IoT Enabling Technologies</b> Wireless Sensor Networks, Cloud Computing, Big Data Analytics, Communication Protocols, Embedded Systems, IoT Levels and Deployment Templates.	<b>7 Hrs</b>
<b>3</b>	<b>Chapter No. 3. Domain specific IoTs</b> Home Automation ,Cities, Environment ,Energy, Retail, Logistics, Agriculture, Industry ,Health and Lifestyle	<b>7 Hrs</b>
<b>Unit II</b>		
<b>4</b>	<b>Chapter No. 4. IoT Platforms Design Methodology</b> IoT Design Methodology, Case Study on IoT System for Weather Monitoring.	<b>5 Hrs</b>
<b>5</b>	<b>Chapter No. 5. IoT systems – Logical design using Python</b>	<b>8 Hrs</b>



Introduction to Python, Data types, data structures, Control of flow, functions modules, packages, file handling, data/time operations, classes, Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib.

<b>6</b>	<b>Chapter No. 6. IoT Physical Devices and Endpoints</b> Basic building blocks of an IoT device, Exemplary device: Rasyberry Pi, interface (serial, SPI, I2C), Programming Rasyberry Pi with Python.	<b>7 Hrs</b>
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**Unit – III**

<b>7</b>	<b>Chapter No. 7. IoT Physical Servers &amp; Cloud Offerings</b> Introduction to Cloud Storage models and communication APIs ,Webserver – Web server for IoT, Cloud for IoT, Python web application framework, Designing a RESTful web API	<b>5 Hrs</b>
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<b>8</b>	<b>Chapter No. 8. Case Studies Illustrating IoT Design</b> Home Automation-smart lighting, home intrusion detection, Cities-smart parking.	<b>5 Hrs</b>
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Text Book:

1. Arshdeep Bahga and Vijay Madiseti, "Internet of Things - A Hands-on Approach", Universities Press, 2015

References:

1. Matt Richardson & Shawn Wallace, "Getting Started with Raspberry Pi", O'Reilly (SPD), 2014

**IoT Practices**

<b>Expt No.</b>	<b>Brief description about the experiment</b>	<b>Slots</b>
<b>DEMONSTRATION</b>		
1	Introduction to preparing the OS for Raspberry Pi	1
2	Introduction to Shell basic for Raspberry Pi	
3	Introduction to GPIO Input/output	1
4	Introduction GPIO using Python	1
5	Introduction to Python and SPI	1
<b>EXERCISE</b>		
6	Creating a Shell scripts for Hook up circuit.	1
7	Implementing PHP and AJAX Calls.	1



8	Working with SPI Protocol.	1
9	Creating Web interface for ADC	1
10	Creating GPIO using Python	1
11	Working with SPI using Python	1
<b>STRUCTURED ENQUIRY</b>		
12	Design and Develop flow control using Raspberry pi kit	2

### Evaluation Scheme

#### 1. Assessment

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

#### 2. End Semester Assessment (ESA) Pattern:

UNIT	8 Questions to be set of 20 Marks each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	3,4	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	5	Any 1 question is to be answered

15ECAE908

E-Commerce

#### Program: MASTER OF COMPUTER APPLICATIONS

Course Code: **15ECAE908**

Course Title: **E-Commerce**

L-T-P:**3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks-Theory: **50** +Lab: **100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **50+ 24**

Exam Duration: **3 Hours**



No	Content	Hrs
<b>Unit I</b>		
1	<b>Chapter 1:</b> Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.	7 Hrs
2	<b>Chapter 2:</b> Consumer Oriented Electronic commerce - Mercantile Process models.	6 Hrs
3	<b>Chapter 3:</b> Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems.	7 Hrs
<b>Unit II</b>		
4	<b>Chapter 4:</b> Inter Organizational Commerce - EDI, EDI Implementation, Value added networks.	6 Hrs
5	<b>Chapter 5:</b> Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.	7 Hrs
6	<b>Chapter 6:</b> Corporate Digital Library - Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.	7 Hrs
<b>Unit – III</b>		
7	<b>Chapter 7:</b> Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering.	5 Hrs
8	<b>Chapter 8:</b> Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processings, Desktop video conferencing.	5 Hrs

Text Book:

1. Frontiers of electronic commerce – Kalakota, Whinston, Pearson

References:

1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
2. E-Commerce, S.Jaiswal – Galgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
4. Electronic Commerce – Gary P.Schneider – Thomson.
5. E-Commerce – Business, Technology, Society, Kenneth C.Taudon, Carol Guyerico Traver



E-Commerce and Security Practices

<i>Expt./ Job No.</i>	<i>Lab assignments/experiment</i>	<i>Slots</i>
<b>Demonstration</b>		
1	Introduction to Secure Web Transaction.	1
2	Introduction to Web Server Security.	1
3	Introduction to SQL Injection.	1
4	Introduction to Cross site Scripting	1
5	Introduction to SSL/TLS Configuration in Apache Web Server.	1
6	Introduction to Payment Gateway Transaction.	1
<b>Exercises</b>		
1	Implementation of Secure Web Transaction.	1
2	Implementation of Web Server Security.	1
3	Implementation of SQL Injection	1
4	Implementation of Cross Site Scripting	1
5	Implementation of SSL/TLS Configuration in Apache Web Sever.	1
6	Implementation of Payment Gateway for given application	1
<b>Structures enquiry</b>		
12	Design and Develop a customized E-Commerce Web Application.	02

**Evaluation Scheme**

**1. Assessment**

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	



ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

**2. End Semester Assessment (ESA) Pattern:**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2,3	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4,5,6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7,8	Any 1 question is to be answered

18ECAC702

Web Programming

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **18ECAC702**

Course Title: **Web Programming**

L-T-P: **2-1-0**

Credits: **3**

Contact Hrs: **4**

ISA Marks: **50**

ESA Marks: **50**

Total Marks: **100**

Teaching Hrs: **42**

Exam Duration: **3 Hours**

No	Content	Hrs
<b>Unit I</b>		
<b>1</b>	<b>Chapter 1: Introduction to HTML</b>  HTML Attributes, Styles in Tags, Current and Evolving Standard: HTML5, Headings, Paragraphs, Comments	<b>4 Hrs</b>
<b>2</b>	<b>Chapter 2: Organizing Information with List &amp; Link</b>  Numbered Lists, Customizing Ordered Lists & Unordered Lists, Nesting Lists, Creating Links, Linking Local Pages Using Relative and Absolute Pathnames, Anatomy of a URL, Kinds of URLs, HTTP and Anonymous FTP.	<b>8 Hrs</b>
<b>3</b>	<b>Chapter 3: Formatting Text with HTML</b>  Character-Level Elements, Semantic HTML Tags, Font Properties, Quotations, Special Characters, Character Encoding	<b>4 Hrs</b>
<b>Unit II</b>		
<b>5</b>	<b>Chapter 4: Structuring a Page with HTML5 Tables &amp; Forms</b>  Cell Padding, Cell and Caption Alignment, Spanning Multiple Rows or Columns, Dynamic Overlays, Controlling Stacking, Creating Drop-Down Menus, Creating Form Controls, Access Keys, Displaying Updates with progress and meter	<b>6 Hrs</b>
<b>6</b>	<b>Chapter 5: Creating CSS with Images</b>	<b>10 Hrs</b>





Creating Page-Level Styles, Contextual Selectors, Classes and IDs, Editing Styles with Developer Tools, The Box Model, Borders, Margins and Padding, Controlling Size and Element Display, Inline Images in HTML, Image Dimensions and Scaling, usemap Attribute, Image Etiquette, Integrating Multimedia: Video and Sound

**Unit – III**

**7 Chapter 6: Using JavaScript and jQuery 5 Hrs**

Overview of JavaScript, Syntactic characteristics, Primitives, operations and expressions, Control statements, Object creation and modification, Arrays, Functions, Constructor, Pattern matching using regular expressions, Errors in scripts, Getting Started with jQuery, Selecting Elements from the Document, Binding Events, Retrieving and Changing Style Sheet Properties, Special Effects.

**8 Chapter 7: XML 5 Hrs**

Document structure; Document Type definitions; Namespaces; XML schemas; Displaying raw XML documents; Displaying XML documents with CSS; XSLT style sheets; XML processors; Web services.

Text Book:

1. Laura Lemay, Rafe colburn, jennifer Kyrnin, MASTERING HTML, CSS & Java Script Web Publishing, BPB publications, 2016.
2. Sebesta, R.W., Programming the World Wide Web, 3rd, Pearson education, 2013.

**Evaluation Scheme**

**1. Assessment**

Assessment	Theory
ISA- 1	25
ISA- 2	25
ESA	50
<b>Total</b>	<b>100</b>

**2. End Semester Assessment (ESA) Pattern:**

UNIT	8 Questions to be set of 20 Marks each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2, 3, 4	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	5,6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7,8	Any 1 question is to be answered



17ECAC804

Python Programming

Course Code: **17ECAC804**

Course Title: **Python Programming**

L-T-P:**3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks: **50**

ESA Marks: **50**

Total Marks: **100**

Teaching Hrs: **42 + 24**

Exam Duration: **3 Hours**

No	Content	Hrs
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**Unit I**

<b>1</b>	<b>Chapter No. 1: Introduction to python</b>	<b>4 Hrs</b>
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How Programming is Different from Using a Computer, The First Steps; Installing Python 3.1 on Non-Windows Systems 6, Using the Python Shell, Beginning to Use Python — Strings, Putting Strings Together in Different Ways; Joining Strings with the Print() Function. Numbers in Python, Program Files; Using the Different Types ,Basic Math, Some Surprises; Order of Evaluation, Number Formats, Using Numbers, Referring to Data — Using Names for Data; Changing Data Through Names, Copying Data, Built in types ; Tuples — Unchanging Sequences of Data, Lists — Changeable Sequences of Data, Treating a String Like a List, Common Sequence Properties; Referencing the Last Elements, Ranges of Sequences, Growing Lists by Appending Sequences, Using Lists to Temporarily Store Data.

<b>2</b>	<b>Chapter No. 2: Making Decisions &amp; Functions</b>	<b>6 Hrs</b>
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Comparing Values, Reversing True and False, Looking for the Results of More Than One Comparison, Handling Errors, Grouping Code under a Name; Choosing a Name, The Same Name in Two Different Places, Checking Your Parameters, Calling Functions from within Other Functions, Flagging an Error on Your Own Terms, Layers of Functions.

<b>3</b>	<b>Chapter No. 3: Classes and Objects, Organizing Programs</b>	<b>6 Hrs</b>
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Thinking About Programming; What is an Object?, Defining a Class; How Code Can Be Made into an Object, Objects and Their Scope, Modules and Packages; Importing a Module, Making a Module from Pre-existing Code, Using Modules — Starting with the Command Line, Basics of Testing Your Modules and Packages; Re-importing Modules and Packages..

**Unit II**

<b>4</b>	<b>Chapter 4: Files and Directories, Modules , Text Processing</b>	<b>10Hrs</b>
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File Objects; Writing Text Files, Appending Text to a File, Reading Text Files, File Exceptions, Paths and Directories, Exceptions in os; Paths, Directory Contents, Obtaining Information about Files, Renaming, Moving, Copying, and Removing Files, Rotating Files, Creating and Removing Directories, Globbing; Exploring Modules; Importing Modules, Finding Modules, Digging through Modules, Creating Modules and Packages; Finishing Your Modules; Defining Module-Specific Errors, Choosing What to



Export , Documenting Your Modules, Testing Your Module, Running a Module as a Program; Why Text Processing Is So Useful; Searching for Files, Clipping Logs, Navigating the File System with the os Module, Working with Regular Expressions.

**5 Chapter 5: Accessing Databases**

**6 Hrs**

Working with DBM Persistent Dictionaries; Choosing a DBM Module ,Creating Persistent Dictionaries, Accessing Persistent Dictionaries, Working with Relational Databases; Writing SQL Statements, Defining Tables , Setting Up a Database, Using the Python Database APIs; Downloading Modules, Creating Connections, Working with Cursors , Working with Transactions and Committing the Results, Examining Module, Capabilities and Metadata, Handling Errors.

**Unit – III**

**6 Chapter 6: Testing, GUI with Python**

**5 Hrs**

Creating GUI Widgets with Tkinter; Resizing the Widget , Configuring Widget Options, Putting the Widgets to Work , Creating Layouts, Packing Order, Controlling Widget, Appearances, Radio Buttons and Checkboxes , Dialog Boxes, Other Widget Types.

**7 Chapter 7: Network Programming**

**5 Hrs**

Understanding Protocols; Comparing Protocols and Programming Languages, The Internet Protocol Stack, A Little Bit About the Internet Protocol, Sending Internet E-mail; The E-mail File Format, MIME Messages, Sending Mail with SMTP and smtplib, Retrieving Internet E-mail; Parsing a Local Mail Spool with mailbox, Fetching Mail from a POP3 Server with poplib, Fetching Mail from an IMAP Server with imaplib, Secure POP3 and IMAP , Webmail Applications Are Not E-mail Applications, Socket Programming; Introduction to Sockets, Binding to an External Hostname, The Mirror Server, The Mirror Client, SocketServer, Multithreaded Servers, The Python Chat Server, Design of the Python Chat Server , The Python Chat Server Protocol, The Python Chat Client, Single-Threaded Multitasking with select.

Textbooks:

1. James Payne, Beginning Python using python 2.6 and Python 3.1,Wiley Publishing Inc, 2010

References:

1. Kent D Lee, Python Programming Fundamentals,2<sup>nd</sup> Edition, 2014
2. Jennifer Camphell, Paul Gries, Greg Wilson, Practical Programming-An Introduction to Computer science using python, 2011



### 1. Assessment

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

### 2. End Semester Assessment (ESA) Pattern:

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2,3	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4,5	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	6,7	Any 1 question is to be answered

\* **Course project:** In this course, group of 2 students will carry out project using Python.

#### Python Programming

Expt No.	Brief description about the experiment	Number Of Slots
<b>DEMONSTRATION</b>		
1	To write, test, and debug simple Python programs using Spyder IDE 3.x	1
2	To implement Python programs with conditionals and loops.	1
3	To demonstrate functions for structuring Python programs.	1
4	Represent compound data using Python lists, tuples, and dictionaries.	2
<b>EXERCISE</b>		
5	Write a code to read and write the data to the text files.	1
6	Write a code to find the most frequent words in a text read from a file.	1



7	Demonstrate the pandas library to perform the different mathematical functions by reading data from excel file.	1
8	Explore the sci-kit learn libraries to implement different algorithms.	1
9	Explore the matplotlib library for the visualization of data.	2
10	Write a code to Simulate bouncing ball using Pygame.	1
<b>STRUCTURED ENQUIRY</b>		
11	Develop an application to plot the visualization using 3d graph of real time data from excel file and plot it online in cloud using plotly .	2

17ECAC805

Data Mining

Course Code: **17ECAC805**

Course Title: **Data Mining**

L-T-P: **3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks: **50 + 100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **42 + 24**

Exam Duration: **3 Hours**

**No**

**Content**

**Hrs**

**Unit I**

**1 Chapter No. 1. Introduction**

**8 Hrs**

Fundamentals of data mining, Kinds of pattern, technologies used, and technologies used, applications, issues, data objects and attribute types, Basic Statistical Descriptions of Data, Data Visualization,.



**2 Chapter No. 2. Data Preprocessing** **5 Hrs**  
Need of preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization.

**3 Chapter No. 3. . Data Warehousing and Online Analytical Processing** **7 Hrs**  
Data Warehouse: Basic Concepts, Data Warehouse Modeling: Data Cube and OLAP, Data Warehouse Design and Usage, Data Warehouse Implementation, Data Generalization by Attribute-Oriented Induction.

**Unit II**

**4 Chapter No. 4. Mining Frequent Patterns, Associations, and Correlations** **6 Hrs**  
Basic Concepts, Frequent Itemset Mining Methods, Which Patterns Are Interesting?: Pattern Evaluation Methods, Pattern Mining in Multilevel, Multidimensional Space, Constraint-Based Frequent Pattern Mining.

**5 Chapter No. 5. . Classification** **7 Hrs**  
Basic Concepts, Decision Tree Induction, Bayes Classification Methods, Rule-Based Classification, Model Evaluation and Selection, Techniques to Improve Classification Accuracy, Bayesian Belief Networks, Classification by Backpropagation.

**6 Chapter No. 6. Graph Mining, Social Network Analysis, and Multi-relational Data Mining** **7 Hrs**  
Methods for Mining Frequent Sub graphs, Mining Variant and Constrained Substructure Patterns, Characteristics of Social Networks, Mining on Social Networks, Multirelational mining, Multirelational Classification, Multirelational Clustering with User Guidance..

**Unit – III**

**7 Chapter No. 7. . Cluster Analysis** **5 Hrs**  
Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Evaluation of Clustering..

**8 Chapter No. 8. Mining Complex Types of Data** **5 Hrs**  
Multidimensional Analysis and Descriptive Mining of Complex, Data Objects, Mining Spatial Databases, Mining Multimedia Databases, Mining Time Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

Text Book:

1. J. Han, M. Kamber., Data Mining Concepts and Techniques, 3<sup>rd</sup> edition, Kaufmann publishers, 2011.

References

1. Pujari, A.K, Datamining Techniques, 1, Universities Press, 2010

**Evaluation Scheme**

**In Semester Assessment (ISA)**

**Assessment**

**Marks**



ISA 1	20
ISA 2	20
Seminar by individual student*	05
Course Project Activity**	05
<b>Total</b>	<b>50</b>

\* **Seminar** topic should be on application of DM in various domains such as health, insurance, sports, social networks, education, politics, business and so on.

\*\***Course Project Activity:** Group of 2 students need to demonstrate the DM tool/s for the extraction of various knowledge from real life data.

**End Semester Assessment (ESA)**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2, 3	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4, 5, 6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7, 8	Any 1 question is to be answered

**Data Mining**

**List of Practices**

S. No	Assignment	
1	Demonstration of preprocessing on given dataset	Using DM tools such as Weka Rapid Miner Orange KNIME Tableau Excel Google Analytics
2	Demonstration of mining Discrimination between different Classes in given dataset	
3	Demonstration of Association rule process on given dataset using Apriori algorithm	
4	Demonstration of classification rule process on given dataset using Decision tree algorithm	
5	Demonstration of classification rule process on dataset using naïve Bayes algorithm	
6	Demonstration of prediction on given dataset using regression techniques	
7	Demonstration of data visualization on given dataset	
8	Demonstration of quartiles using FIVE number summary on given dataset	
9	Demonstration of Graph displays of statistical class description on given dataset using:  1. Histogram 2. A quantile plot 3. A quantile-quantile plot 4. A scatter plot	



	5. A loess curv	
10	Demonstration of web mining for given portal.	

17ECAC806	Programming in C# with .NET
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Course Code: **17ECAC806** Course Title: **Programming in C# with .NET**  
 L-T-P:**2-1-0** Credits: **3** Contact Hrs: **4**  
 ISA Marks Theory: **50** ESA Marks: **50** Total Marks: **100**  
 Teaching Hrs: **42** Exam Duration: **3 Hours**

No	Content	Hrs
<b>Unit I</b>		
<b>1</b>	<b>Chapter No. 1.The Philosophy of .NET</b> Understanding the Previous State of Affairs, The .NET Solution, Introducing the Building Blocks of the .NET Platform (CLR,CTS, and CLS), The Role of the .NET Base Class Libraries, What C# Brings to the Table, An Overview of .NET Assemblies, The Role of the Common Intermediate Language , The Role of .NET Type Metadata, The Role of the Assembly Manifest, Compiling CIL to Platform –Specific Instructions, Understanding the Common Type System, Intrinsic CTS Data Types, Understanding the Common Languages Specification, Understanding the Common Language Runtime, The Assembly/namespace/type Distinction, Using ildasm.exe, Deploying the .NET Runtime, The Platform independent nature of .NET, Installing the .NET Framework, C# Command-Line Compiler, Building C# Applications using csc.exe, Working with csc.exe Response Files.	<b>6 Hrs</b>
<b>2</b>	<b>Chapter No. 2.C# Language Fundamentals.</b> The Anatomy of a Simple C# Class, An Interesting Aside : The System.Environment Class, Defining Classes and Creating objects, The System.Console Class, Establishing Member Visibility, Default Values of Class Member Variables, Member Variable Initialization Syntax, Defining Constant Data, Defining Read-only fields, Understanding the static keyword, Method Parameter Modifiers, Iteration Constructs, Decision Constructs and the Relational/Equality Operators, Understanding Value Types and Reference Types, Understanding Boxing and Unboxing Operations, Working with .NET Enumerations, The Master Class: System.Object, Overriding some default behaviours of System.Object, The System Data types( and C# Shorthand notation), The System.String data types, The role of System.Text.StringBuilder, .NET Array Types, Understanding C# Nullable Types, Defining Custom Namespaces	<b>5 Hrs</b>
<b>3</b>	<b>Chapter No. 3. Object-Oriented Programming with C#</b> Understanding the C# Class Type, Reviewing the Pillars of OOP, The First Pillar: C#'s Encapsulation Services, The Second Pillar: C#'s Inheritance Support, Programming for Containment/Delegation, The Third Pillar: C #'s Polymorphic Support, C# Casting rules, Understanding C# Partial types, Documenting C# Source Code via XML	<b>5 Hrs</b>

**Unit II**





- 4 Chapter No. 4.Object Lifetime and Exceptions Handling. 6 hrs**  
Classes, Objects and References, the basics of Object Lifetime, The role of Application Roots, Understanding Object Generations, System.GC type, Building Finalizable Objects, Building Disposable Objects, Building Finalizable and Disposable types. Ode to Errors, Bugs, and Exceptions, The Role of .NET Exception Handling, The Simplest possible example, Configuring the state of an exception, System – Level Exception (System. System Exception), Application-Level Exception (System.ApplicationException), Processing Multiple Exception, The Finally Block, The result of unhandled exceptions, Debugging Unhandled exceptions using VS. NET .
- 5 Chapter No. 5.Interfaces and Collections 5 Hrs**  
Defining Interfaces in C#, Implementing an Interface in C#, Contrasting Interfaces to Abstract Base Classes, Invoking Interface Members at the Object Level, Interfaces As Parameters, Interfaces As Return Values, Arrays of Interfaces Types, Understanding Explicit Interface Implementation, Building Interface Hierarchies, Implementing Interfaces Using Visual Studio 2005, Building Enumerable Types(IEnumerable and IEnumerator), Building Cloneable Objects(IConeable), Building Comparable Objects(Comparable), The Interfaces of the System.Collections Namespace, The Class Types of System.Collections.
- 6 Chapter No. 6.Callback Interfaces, Delegates, and Events, Advanced C# Techniques 5 Hrs**  
Understanding Callback Interfaces, Understanding the .NET Delegate type, Defining a Delegate in C#, The System.multicastDelegate and System.Delegate Base Classes, Investigating a Delegate Object, Delegates as Parameters, Understanding C# Events Building a Custom Indexer, Internal Representations of Type Indexers: Final Details, Understanding Operator Overloading Binary Operators, Unary Operators, Equality Operators, Comparison Operators, Understanding Custom Type Conversions, The Advanced Key words of C#, C# Preprocessor Directives.
- Unit – III**
- 7 Chapter No. 7.Programming with Windows Forms. 5 hrs**  
Controls - Labels, Text boxes, Masked Text boxes, Buttons, Check boxes, Radio Buttons, Group Boxes, Checked List Boxes, List Boxes, Combo Boxes, Configuring the Tab Order, Setting the Form's Default Input Button, Working with more Exotic Controls – Month Calendars, Tool Tips, Tab Controls, Track Bars, Panels, Up Down Controls, Error Providers, Tree Views, Web Browsers, Building Custom Windows Forms Controls – Creating Images, Building Design-Time UI, Defining Custom Events, Defining Custom Properties.
- 8 Chapter No. 8.Database Access with MSSQL Server 5 hrs**  
Overview of Data Access, Creating database connections, connecting to MSSQL Server, Dataset and Data table features, using inline SQL Statements, using stored procedures , Executing select commands, SQL transaction

Text Book:

1. Andrew Troelsen: Pro C# with .NET 3.0, Special Edition, Dream tech Press, India, 2007.Chapters: 1 to 11 (up to pp.389, except Chapter 10)



### Evaluation Scheme

#### Assessment

Assessment	Theory
ISA- 1	25
ISA- 2	25
ESA	50
<b>Total</b>	<b>100</b>

#### End Semester Assessment (ESA) Pattern:

UNIT	8 Questions to be set of 20 Marks each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2, 3	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4,5,6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7,8	Any 1 question is to be answered

17ECAP803

Mini Project-3

Course Code: **17ECAP803**

Course Title: **Mini Project-3**

L-T-P: **0-0-2**

Credits: **2**

Contact Hrs: **4**

ISA Marks: **100**

ESA Marks: **100**

Total Marks: **200**

Teaching Hrs: **72 approx.**

Exam Duration: **3 Hours**

#### Theme: "Mini project Using Java"

Java is one of the fundamental programming languages that can be used in many applications as well as product developments. The simple reason for this is because Java can be put to use in various platforms due to its multi-platform nature. Java is one of the favorite choices for developers for many reasons like security, object oriented(reusability), cross platform computing, multithreaded capability, Rich API, Powerful development tools ,availability of various frameworks, Great collection of open source libraries, wonderful community support, Excellent documentation support. Support for various databases and many more.

Students can use the following tools in web and mobile applications as well as product developments:

- ☑ Struts, Spring, Hibernate and JPA
- ☑ JAXB and Apache Axis 2/Java
- ☑ JSP, Servlets, JDBC, EJB, JMS, JTA and JUnit
- ☑ Apache Tomcat, JBoss and GlassFish
- ☑ JavaScript, JSF, GWT and jQuery
- ☑ Eclipse, Netbeans and JBoss tools
- ☑ TestNG



☑ jBPM and Drools

☑ JCR

**Objectives:**

Help students to utilize and strengthen the knowledge of java which they have learnt in previous semester.

**Methodology:**

Students are asked to make a team of 3-4 members and can choose the different categories of projects like desktop applications, web applications, mobile application and distributed application and work once it is approved by the coordinator.

**Assessment:**

Students Assessment through CIE (80%) + SEE (20%)

Continuous Internal Evaluation	Assessment	Marks
	Problem Definition, Literature Review	10
	Synopsis and SRS Deliverables	10
	Design (Module wise algorithmic design)	20
	Coding	10
	Integration and testing	10
	Report	10
	Presentation skills and Viva-voce	10
	<b>Total</b>	<b>80</b>
<b>Semester End Examination</b>	Presentation	10
	Viva-voce	10
	<b>Total</b>	<b>100</b>

1.1 Course Objectives:

The Mini Project being part of the course work is not only a mechanism to demonstrate the abilities and specialization but also provides the opportunity to demonstrate originality, teamwork, inspiration, planning and organization in a software project. One can put into practice the techniques that have been taught throughout the previous courses. Mini-projects develop practical skills in students. The idea is to propose a problem that one might encounter in future career (be it in academia, industry, or government). Then propose a solution and implement it.

**Theme: Java Based E-Commerce Applications with Multilingual Support**

**E-commerce Objectives:**



Most business houses are shifting their operations to the online world. Right from buying apparels to computers to booking tickets and renting out apartments, everything can be done through the Internet now. It is a win-win formula for both the customers and the business houses. Digital India aims to boost E-business and the E-commerce industry with the vision that it would in turn boost the economy is a whole.

**Multilingual Objectives:**

Language is an essential driver of enterprise growth. The user interface is the key component of any application that needs to support various language speaking audiences. Making an app that appeals to and is available for more users broadens the market and brings more revenue in the app sales and there will be more exposure to the business.

**Evaluation:**

- The project assessment is done by an evaluation team as per the schedule.

**Guidelines for In Semester Assessment (ISA) Scheme**

Phase wise distribution of marks	Marks
Identification and defining the problem	15
Software Requirement Specification	20
Software Design	15
Mid-way Implementation	10
Final Demo and Report Submission	20
Total	80

**End Semester Assessment (ESA):**

There will be a final presentation /demonstration//viva-voce at the end of the semester for 20 Marks

17ECAE802

Linux Administration

Course Code: **17ECAE802**

Course Title: **Linux Administration**

L-T-P:**3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks-Theory: **50** +Lab: **100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **42+24**

Exam Duration: **3 Hours**

**No**

**Content**

**Hrs**

**Unit I**



**1 Chapter 1. Basic System Configuration 6 Hrs**

Opening Graphical Applications, System Locale and Keyboard Configuration: Setting the System Locale, Changing the Keyboard Layout, Managing Users and Groups; Introduction to Users and Groups, Managing Users in a Graphical Environment..

**2 Chapter 2. Package Management, Services and Daemons 6 Hrs**

Yum: Checking For and Updating Packages, Packages and Package Groups, Configuring Yum and Yum Repositories. Configuring Services, Running Services OpenSSH: The SSH Protocol, An Open SSH Configuration, Open SSH Clients

**3 Chapter 3. Web & Mail Servers : 8 Hrs**

**Web Servers: The Apache HTTP Server** Updating the Configuration, Running the httpd Service, Editing the Configuration Files, Working with Modules , Setting Up Virtual Hosts, Setting Up an SSL Server.

**Mail Servers-** Email Protocols, Email Program Classifications, Mail Transport Agents, Mail Delivery Agents, Mail User Agents

**Unit II**

**4 Chapter 4. File & Directory Servers : 10 Hrs**

**FTP Servers :** The File Transfer Protocol, FTP Servers, Files Installed with **vsftpd**, Starting and Stopping **vsftpd**, **vsftpd** Configuration Options. Runing FTP Server

**Samba Server :** Introduction to Samba, Samba Daemons and Related Services, Connecting to a Samba Share, Configuring a Samba Server ,Starting and Stopping Samba, Samba Server Types and the smbconf File, Samba Security Modes, Samba Account Information Databases, Samba Network Browsing , Samba with CUPS Printing Support, Samba Distribution Programs

**Directory Servers** -OpenLDAP, Introduction to LDAP, Installing the OpenLDAP Suite , Configuring an OpenLDAP Server , SELinux Policy for Applications Using LDAP, Running an OpenLDAP Server, Configuring a System to Authenticate Using OpenLDAP

**5 Chapter 5 Viewing and Managing Log Files - 5 Hrs**

Locating Log Files, Basic Configuration of Rsyslog, Working with Queues in Rsyslog , Using Rsyslog Modules , Interaction of Rsyslog and Journal, Structured Logging with Rsyslog , Debugging Rsyslog, Using the Journal, Managing Log Files in a Graphical Environment.

**Unit – III**

**6 Chapter. 6. Working with the GRUB 2 Boot Loader 5 Hrs**

Configuring the GRUB 2 Boot Loader, Customizing GRUB Menu, GRUB 2 Password Protection, Reinstalling GRUB , GRUB 2 over Serial Console, Terminal Menu Editing During Boot, UEFI Secure Boot



## 8 Chapter 7. Automating System Tasks

5 Hrs

-Cron and Anacron- Installing Cron and Anacron, Running the Cron Services, Configuring Anacron Jobs, Configuring Cron Jobs, Controlling Access to Cron, Black and White Listing of Cron Jobs At and Batch-Installing At and Batch, Running the At Service, Configuring an At Job, Configuring a Batch Job, Viewing Pending Jobs, Additional Command Line Options, Controlling Access to At and Batch.

Textbook:

4. Fedora 21 System Administrator's Guide Deployment, Configuration, and Administration of Fedora 21 Edition 1.0, Author Jaromír Hradílek [jhradilek@redhat.com](mailto:jhradilek@redhat.com), Douglas Silas [silas@redhat.com](mailto:silas@redhat.com), Martin Prpič [mprpic@redhat.com](mailto:mprpic@redhat.com) etc.

References:

1. Kemp, Juliet, Spinger, "Linux System Administration"
2. Anita Sengar "IT Infrastructure Management" 2012 Edition, publisher: S K Kataria and Sons
3. Sjaak Laan "Infrastructure Architecture - Infrastructure Building Blocks and Concepts Second Edition, Kindle Edition, Lulu Press Inc; Second Edition

### Linux Administration Practices

#### COURSE DESCRIPTION:

IT infrastructure consists of a set of physical devices and software applications that are required to operate the entire enterprise. IT infrastructure also consists both human and technical capabilities. These services include the following- Computing platforms used to provide computing services, that connect employees, customers, and suppliers into a coherent digital environment, including servers, Data management services that store and manage corporate data and provide capabilities for analyzing the data and Application software services that provide enterprise-wide capabilities such as enterprise resource planning, customer relationship management, supply chain management, and knowledge management systems that are shared by all business units. It allows an organization to deliver IT solutions and services to its employees, partners and/or customers and is usually internal to an organization and deployed within owned facilities.

#### OBJECTIVES

- Acquire comprehensive knowledge, technical expertise and hands-on experience in IT Infrastructure Management
- To learn all aspects of IMS such as Networking, Operating Systems, Virtualizations and Data Center technologies.

#### LAB REQUIREMENTS:

- A modern web-browser with HTML5 and JavaScript enabled.
- Remote Desktop Client connection software.
- Internet connectivity Microsoft Account (LiveID).

#### LIST OF EXERCISES



Expt./ Job No.	Lab assignments/experiment	Implementation	Number of Slots
8.	Web Server	Apache Web Server, IIS Server: Install and Configure the Apache Web Server on Linux and IIS server on windows.	01
9.	Samba Server	Implementation of Windows files and print services for Linux allowing the sharing of files and printers between Windows and Linux.	01
10.	LDAP Server	LDAP Server: Lightweight Directory Access Protocol- Server Installation to access a directory service.	01
11.	Mail Server	Mail Server configuration- POP3 Server, IMAP Server	01
12.	Proxy Server	Develop a small web proxy server, which is able to cache web pages. It is a very simple proxy server which only understands simple GET-requests, but is able to handle all kinds of objects - not just HTML pages, but also images.	01
13.	Firewalls and NAT (Network Address Translation)	Use of iptables to build a permissive firewall by selectively filtering packets based on protocol type.  To demonstrate how addresses may be translated from private addresses to public and vice versa as they pass in and out of the firewall.	01
14.	Cloud Infrastructure: Azure Hands-on Lab (HOL) Build your Infrastructure in the Cloud using Windows Azure Infrastructure Services -	6. Login to the Windows Azure Management Portal, Define a new Windows Azure Affinity Group and Create a new Windows Azure Storage Account. 7. Register a DNS Server in Windows Azure. 8. Define a Virtual Network in Windows Azure. 9. Configure Windows Server Active Directory in a Windows Azure VM. 10. Configure New Machine for File Services in a Windows Azure VM.	01

**References:**

12. <https://amizone.net/AdminAmizone/WebForms/Academics/NewSyllabus/194201472058683.pdf>
13. <http://itproguru.com/azurehol/#sthash.HMydlzVA.dpuf>



14. <https://simms-teach.com/docs/cis192/cis192lab08.pdf>
15. <https://simms-teach.com/resources.php>
16. [http://www.cs.rpi.edu/~kotfid/security1/PDF2/NS1\\_lab\\_6\\_1\\_4\\_en.pdf](http://www.cs.rpi.edu/~kotfid/security1/PDF2/NS1_lab_6_1_4_en.pdf)
17. <http://www.cse.unsw.edu.au/~cs3331/12s1/Labs/>
18. <https://www.6diss.org/workshops/ca/dns-practical.pdf>
19. <http://www.dwaynewhitten.com/info306/pages/lab.html>
20. [http://www.bo.ingv.it/~scacciag/home\\_files/teach/netadminguide.pdf](http://www.bo.ingv.it/~scacciag/home_files/teach/netadminguide.pdf)
21. <https://techpolymath.com/2015/02/16/how-to-setup-a-dns-server-for-a-home-lab-on-ubuntu-14-04/>
22. <http://www.dwaynewhitten.com/info306/lab2.pdf>

### Evaluation Scheme

#### Assessment

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

#### End Semester Assessment (ESA) Pattern:

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2, 3, 4	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	5, 6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7, 8	Any 1 question is to be answered

(01FM16MCAXXX)

16ECAC901

Big Data Analytics

#### Program: MASTER OF COMPUTER APPLICATIONS

Course Code: 16ECAC901

Course Title: **Big Data Analytics**

L-T-P: **2-1-0**

Credits: **3**

Contact Hrs: **4**

ISA Marks-Theory: **50**

ESA Marks: **50**

Total Marks: **100**

Teaching Hrs: **42**

Exam Duration: **3 Hours**

No

Content

Hrs





**Unit I**

- 1 Chapter 1: Types of digital data and concept of big data** **4 Hrs**  
Classification of digital data: Unstructured, Semi-structured, and Structured;  
Characteristics of data, Evolution of big data, and definition of big data: 5 Vs, challenges  
with big data, typical data warehouse environment: Hadoop Environment.
- 2 Chapter 2: Big Data Analytics** **8 Hrs**  
What is big data analytics? What big data analytics is not? Classification of analytics, Top  
challenges facing big data, Importance of big data analytics, Need of technology to meet  
big data challenges, Data science: business acumen skills, technology expertise,  
mathematics expertise, Data scientist, terminologies used in big data environments,  
BASE, top analytics tools.
- 3 Chapter 3: Big data technology landscape** **4 Hrs**  
Not Only SQL (NOSQL): Types of NoSQL, Advantages of NoSQL, Use of NoSQL in industry,  
NewSQL, Hadoop: features, key advantages, versions, overview of Hadoop ecosystem,  
Hadoop distributions, Hadoop versus SQL, Cloud-based Hadoop solutions.

**Unit II**

- 4 Chapter 4: Hadoop distributed file system** **8 Hrs**  
Introduction, Why Hadoop, RDBMS versus Hadoop, distributed computing challenges:  
hardware failure, how to process gigantic store of data, history of Hadoop, Hadoop  
overview, use case of Hadoop, Hadoop distributors, Hadoop Distributed File System  
(HDFS): Name node, Data node, secondary Name node, anatomy of file read, anatomy of  
file write; replica placement, processing of data with Hadoop, Managing resources an  
applications with Hadoop, Interacting with Hadoop ecosystem.
- 5 Chapter 5: MongoDB and query language** **4 Hrs**  
Introduction, Why MongoDB, Terms used in RDBMS and MongoDB, data types in  
MongoDB, MongoDB query language: basic functions, Arrays, aggregate functions,  
MapReduce function, Java script programming, Cursors in MongoDB, MongoImport and  
MongoExport..
- 6 Chapter 6: Cassandra and MapReduce programming** **4 Hrs**  
Introduction, Apache Cassandra, features of Cassandra, data types, CQLSH,  
Keyspaces, CRUD operations, Introduction to MapReduce, Mapper, Reducer,  
Combiner, partitioner, searching, Sorting, and compression..

**Unit – III**

- 7 Chapter 7: Hive and query language** **5 Hrs**  
Introduction, What is Hive, History of Hive and recent releases of Hive, Hive integration  
and work flow, Hive data units; Hive architecture, Hive data types, Hive file format, Hive  
Query Language (HQL): DDL, DML, Hive shell, database, tables, Partitions, Bucketing,  
Views, Sub-query: RCFile implementation, SERDE, User defined function.



**8 Chapter 8: PIG**

**5 Hrs**

Introduction, What is PIG, Key features of PIG; The anatomy of PIG, PIG philosophy, use case for PIG: ETL processing, PIG Latin overview, Data types in PIG, Running PIG, execution modes of PIG, HDFS commands, relational operators, eval function, complex data types, piggy bank, user defined function.

Text Book

1. Seema Acharya, Subhashini Chellapan, Big Data and Analytics, First edition, 2015, Wiley publications.

References

1. EMC Education Services, Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, Wiley Publications.
2. Frank J Ohlhorst, Big Data Analytics: Turning Big Data into Big Money||, Wiley and SAS Business Series, 2012.
3. Colleen Mccue, Data Mining and Predictive Analysis: Intelligence Gathering and Crime Analysis||, Elsevier, 2007.
4. Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer, 2007.
5. Bill Franks, Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics||, Wiley and SAS Business Series, 2012.
6. Paul Zikopoulos, Chris Eaton, Paul Zikopoulos, Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data||, McGraw Hill, 2011.
7. Jiawei Han, Micheline Kamber, Data Mining Concepts and Techniques||, Second Edition, Elsevier, Reprinted 2008.

**Evaluation Scheme**

**1. Assessment**

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

**2. End Semester Assessment (ESA) Pattern:**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	3,4	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	5,6	Any 1 question is to be answered



16ECAC902

Advanced Java Programming

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: 16ECAC902

Course Title: **Advanced Java Programming**

L-T-P: **2-1-0**

Credits: **3**

Contact Hrs: **4**

ISA Marks-Theory: **50**

ESA Marks: **50**

Total Marks: **100**

Teaching Hrs: **42**

Exam Duration: **3 Hours**

No	Content	Hrs
<b>Unit I</b>		
<b>1</b>	<b>Chapter 1: Java Server Pages</b> JSP Technologies, Understanding the Client-Server Model, Understanding Web server software, Configuring the JSP Server, Handling JSP Errors, JSP Translation Time Errors, JSP Request Time Errors o Creating a JSP Error Page.	<b>9 Hrs</b>
<b>2</b>	<b>Chapter 2: Session Management</b> HTTP as a stateless protocol, Hidden form fields, Cookies, session tracking Http Session, Exception handling and error pages, Directives	<b>3 Hrs</b>
<b>3</b>	<b>Chapter 3: Java Beans</b> Concepts of Java Beans, Developing Java Beans, Controls and Properties of a Bean, Types of Properties.	<b>5 Hrs</b>
<b>Unit II</b>		
<b>4</b>	<b>Chapter 4: Struts</b> Introduction to the Apache Struts o MVC Architecture o Struts Architecture, How Struts Works?, Introduction to the Struts Controller o Introduction to the Struts Action Class ,Using Struts Action From Class Using Struts HTML Tags Introduction to Struts Validator Framework ,Client Side Address Validation in Struts o Custom Validators Example, Developing Application with Struts Tiles	<b>7 Hrs</b>
<b>5</b>	<b>Chapter 5: Spring Framework</b> Introduction to spring 3.0, steps to use spring framework in applications, understanding IOC and Dependency Injection, Understanding the bean life-cycle, annotation based dependency injection.	<b>7 Hrs</b>
<b>6</b>	<b>Chapter 6: Hibernate</b> Introduction to Hibernate 3.0 ,Hibernate Architecture ,First Hibernate Application	<b>3 Hrs</b>
<b>Unit – III</b>		
<b>7</b>	<b>Chapter 7: RMI</b> RMI Architecture, Designing RMI application, Executing RMI application.	<b>4 Hrs</b>
<b>8</b>	<b>Chapter 8: Maven (Project Management Tool)</b>	<b>4 Hrs</b>



What is Maven, Ant Vs Maven, Install Maven ,Maven Repository(Local, Central ,Remote) , Maven pom.xml, Maven web App, Maven plugin

Text Book:

1. Java Server Programming Java EE7 (J2EE 1.7), Black Book Kindle Edition 2014
2. Spring in action 4th edition by Carig walls

References:

1. www.Javatpoint.com
2. www.tutorialspoint.com

### Evaluation Scheme

#### 1. Assessment

Assessment	Theory
ISA- 1	25
ISA- 2	25
ESA	50
<b>Total</b>	<b>100</b>

#### 2. End Semester Assessment (ESA) Pattern:

UNIT	8 Questions to be set of 20 Marks each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2,3	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4,5,6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7,8	Any 1 question is to be answered

16ECAC903

Mobile Application Development

#### Program: MASTER OF COMPUTER APPLICATIONS

Course Code: 16ECAC903

Course Title: **Mobile Application Development**

L-T-P:**3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks-Theory: **50** +Lab: **100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **42 + 24**

Exam Duration: **3 Hours**

**No**

**Content**

**Hrs**

**Unit I**



<b>1</b>	<b>Chapter No. 1- Mobility and Android</b> Introduction, Mobility Panorama, Mobile Platforms, App Development Approaches, Android Overview.	<b>2 Hrs</b>
<b>2</b>	<b>Chapter No. 2- Getting Started with Android</b> Introduction, Setting up Development Environment, Saying Hello to Android, Traversing an Android App, Project Structure, Logical Components of an Android App, Android Tool Repository, Installing and Running App Devices.	<b>2 Hrs</b>
<b>3</b>	<b>Chapter No. 3- Learning with an Application</b> Introduction, 3CheersCable App, Mobile App Development, Challenges, Tenets of a Winning App.	<b>3 Hrs</b>
<b>4</b>	<b>Chapter No. 4- App User Interface</b> Introduction, Activity, UI Resources, UI Elements and Events, Interaction among Activities, Fragments, Action Bar and Applications.	<b>5 Hrs</b>
<b>5</b>	<b>Chapter No. 5- App Functionality - Beyond UI</b> Introduction, Threads, AsyncTask, Service, Notifications, Intents and Intent Resolution, Broadcast Receivers, Telephony and SMS- Their Application.	<b>4 Hrs</b>
<b>Unit II</b>		
<b>6</b>	<b>Chapter No. 6. App Data - Persistence and Access</b> Introduction, Flat Files, Shared Preferences, Relational Data, Data Sharing Across Apps, Enterprise Data.	<b>4 Hrs</b>
<b>7</b>	<b>Chapter No. 7. Graphics and Animation</b> Introduction, Android Graphics, Android Animation.	<b>4 Hrs</b>
<b>8</b>	<b>Chapter No. 8. Multimedia</b> Introduction, Audio, Video and Images, Playback, Capture and Storage.	<b>4 Hrs</b>
<b>9</b>	<b>Chapter No. 9. Location Services and Maps</b> Introduction, Google Play Services, Location Services, Maps	<b>4 Hrs</b>
<b>Unit – III</b>		
<b>10</b>	<b>Chapter No. 10. Sensors</b> Introduction, Sensors in Android, Android Sensor Framework, Motion Sensors, Position Sensors, Environment Sensors.	<b>4 Hrs</b>
<b>11</b>	<b>Chapter No. 11. Testing Android Apps</b> Introduction, Testing Android App Components, App Testing Landscape Overview Publishing Apps: Introduction, Groundwork, Configuring, Packaging, Distributing.	<b>4 Hrs</b>
<b>12</b>	<b>Chapter No. 12. Publishing Apps</b> Introduction, Groundwork, Configuring, Packaging, Distributing.	<b>2 Hrs</b>

Text Book:

1. AnubhavPradhan, Anil V Deshpande, Composing Mobile Apps using Android, 2010, Wiley, 2010

References:

1. Barry Burd, Android Application Development All in one for Dummies.
2. Ian F Darwin, Android Cookbook.
3. Frank Ableson, RobiSen, Chris King, C. Enrique Ortiz, Android in Action, Manning



Publications.

### Mobile Application Development Course Project

#### Objective:

This is the course Project for the Mobile App Development. The students will be divided into project teams, and each team will develop a marketable mobile app. ideally, each project team will have 2 or 3 students with a maximum of 4. The goals are to expose students to the process of developing a new mobile app from start to finish and to provide an experience very similar to what a developer would have at any company where they work to produce an app that not only works but is also something that meets the needs of their clients.

#### Concepts:

Mobile app development, project management, and quality assurance.

#### Required Textbooks

AnubhavPradhan, Anil V Deshpande, Composing Mobile Apps using Android, 2010 wiley, 2010.

Chapters	Topic	Course Project	Slots
Ch-01: Mobility and Android. Ch-02: Getting Started with Android. Ch-03: Learning with an Application.	Mobility Panorama, App Development Approaches, Setting Development Environment, Installing and Running App Devices, Mobile App Development Challenges.	Development of logical Architecture for given Mobile Application.	2
Ch-04: App User Interface. Ch-05: App Functionality.	Activity, UI Resources, UI Elements and Events, Threads, AsyncTask, Notification, Broadcast Receivers	Building User Interface for given Application.	2



Ch-06: App Data – Persistence and Access.	Flat Files, Shared Preferences, Relational Data, Data Sharing Across Apps.	Exchanging a Data with in Enterprise Application.	2
Ch-07: Graphics and Animation.	Android Graphics, Android Animation.	Adding Animation and Graphics into Application.	2
Ch-11: Testing Android Apps.	Testing Android App Components, App testing Landscape Overview.	Testing an App.	2
Ch-12: Publishing Apps.	Groundwork, Configuring, Packaging, Distribution.	Deploying an App.	2

**Evaluation Scheme**

**1. Assessment**

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

**2. End Semester Assessment (ESA) Pattern:**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2,3,4,5	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	6,7,8,9	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	10,11,12	Any 1 question is to be answered

16ECAE906

Machine Learning

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **16ECAE906**

Course Title: **Machine Learning**

L-T-P:**3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks-Theory: **50** +Lab: **100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **42 + 24**

Exam Duration: **3 Hours**

**No**

**Content**

**Hrs**



**Unit I**

**1 Chapter 1. Introduction 4 Hrs**

Introduction: Statistical Decision Theory - Regression, Classification, Bias Variance:

**2 Chapter 2. Linear Regression and Linear Classification 6 Hrs**

Linear Classification, Logistic Regression, Linear Discriminant Analysis; Perceptron; Linear Regression, Multivariate Regression, Subset Selection, Shrinkage Methods, Principal Component Regression, Partial Least squares.

**3 Chapter 3. Support Vector Machines and Artificial Neural Networks 6 Hrs**

Support Vector Machines, Neural Networks - Introduction, Early Models, Perceptron Learning, Backpropagation, Initialization, Training & Validation.

**Unit II**

**4 Chapter 4. Bayesian Learning and Decision Trees 6 Hrs**

Parameter Estimation - MLE, MAP, Bayesian Estimation  
Decision Trees, Regression Trees, Stopping Criterion & Pruning  
Loss functions, Categorical Attributes, Multiway Splits, Missing Values  
Decision Trees - Instability.

**5 Chapter 5. Evaluation Measures and Hypothesis Testing 4 Hrs**

Evaluation Measures, Bootstrapping & Cross Validation, Class Evaluation Measures, ROC curve, MDL

**6 Chapter 6. Ensemble Methods and Clustering 6 Hrs**

Ensemble Methods - Bagging, Committee Machines and Stacking, Boosting, Gradient Boosting, Random Forests, Multi-class Classification, Naive Bayes, Bayesian Networks; Partitional Clustering, Hierarchical Clustering, Birch Algorithm, CURE Algorithm, Density-based Clustering.

**Unit – III**

**7 Chapter 7. Graphical Models and Expectation Maximization 5 Hrs**

Undirected Graphical Models, HMM, Variable Elimination, Belief Propagation; Gaussian Mixture Models, Expectation Maximization.

**8 Chapter8. Learning Theory and Reinforcement Learning 5 Hrs**

Learning Theory, Introduction to Reinforcement Learning, RL framework, TD learning, Solution Methods, Applications.





Text Book:

1. T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning, 2e,
2. Christopher Bishop. Pattern Recognition and Machine Learning. 2e.

References:

1. Introduction to machine learning with python by Andreas C. Müller and Sarah Guido

**Machine Learning Practices Using Python**

- 1) Implement linear regression with one variable to predict profits for a food truck. Suppose you are the CEO of a restaurant franchise and are considering different cities for opening a new outlet. The chain already has trucks in various cities and you have data for profits and populations from the cities.
- 2) Build a logistic regression model to predict whether a student gets admitted to a university. Suppose that you are the administrator of a university department and you want to determine each applicant's chance of admission based on their results on two exams.
- 3) Implement one-vs-all logistic regression and neural networks to automate handwritten digit recognition (0 to 9)
- 4) Implement the backpropagation algorithm for neural networks and apply it to task of handwritten digit recognition.
- 5) Build a Spam Classifier using Support Vector Machines.
- 6) Implement the K-means clustering algorithm and apply it to compress an image.
- 7) Build Principle Component analysis to find a low dimensional representation of face images.
- 8) Implement the anomaly detection algorithm and apply it to detect failing servers on a network.
- 9) Build a recommender system for movies by using collaborative filtering.

**Evaluation Scheme**

**1. Assessment**

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

**2. End Semester Assessment (ESA) Pattern:**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
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I	3 Questions to be set of 20 Marks Each	1,2,3,4	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	5,6,7	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	8,9	Any 1 question is to be answered

16ECAP901

Mini Project-3

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: 16ECAP901

Course Title: **Mini Project-3**

L-T-P: **0-0-2**

Credits: **2**

Contact Hrs: **4**

ISA Marks: **100**

ESA Marks: **100**

Total Marks: **200**

Teaching Hrs: **36**

Exam Duration: **3 Hours**

**Theme: "Development of Applications using .NET/ JavaTechnology"**

**.NET Technology**

The Microsoft .NET framework has major advantages over previous programming languages and environments. Applications written in .NET may be in any of several different programming languages (language interoperability). .NET consists of a re-useable library of classes (small components that help developers create applications). It also consists of a development environment to help developers rapidly and graphically build applications. All operating system functions can be encapsulated within .NET. The framework manages the execution of applications and Web services, and provides many functionalities including security enforcement and memory management. Because of these advantages, corporations and industry are beginning to embrace .NET. They will need graduates who know how to use it. Hence, a project done using this technology would give an insight of the powerful features of .NET and help the students to find a job in this field. Below is a list of some of the types of applications that can be created using the .NET platform.

- Customer relationship management
- Accounting applications
- Product/inventory applications
- Warehousing applications using hand-held devices
- Web sites
- Value chain/supply management
- Integration with partners through the Internet
- XML Web services
- PDA (hand-held) applications

**Objectives of using .NET Technology-**

Student doing a project in .NET technology should be able to:



1. Develop an application that is pure OOP, platform independent, language independent and interoperable.
2. Use the features of .NET to make the application scalable, maintainable, easily deployable, reliable and secure.
3. Work with databases using ADO.NET.
4. Develop background processes windows services.
5. Create animations using .NET's WPF.
6. Create and use Web Services through SOA.

### **Java Technology**

Java is one of the fundamental programming languages that can be used in many applications as well as product developments. The simple reason for this is because Java can be put to use in various platforms due to its multi-platform nature. Java is one of the favorite choices for developers for many reasons like security, object oriented(reusability), cross platform computing, multithreaded capability, Rich API, Powerful development tools ,availability of various frameworks, Great collection of open source libraries, wonderful community support, Excellent documentation support. Support for various databases and many more.

Students can use the following tools in web and mobile applications as well as product developments:

- ☒ Struts, Spring, Hibernate and JPA
- ☒ JAXB and Apache Axis 2/Java
- ☒ JSP, Servlets, JDBC, EJB, JMS, JTA and JUnit
- ☒ Apache Tomcat, JBoss and GlassFish
- ☒ JavaScript, JSF, GWT and jQuery
- ☒ Eclipse, Netbeans and JBoss tools
- ☒ TestNG
- ☒ jBPM and Drools
- ☒ JCR

#### **Objectives:**

Help students to utilize and strengthen the knowledge of Java which they have learnt in previous semester.

#### **Methodology:**

Students are asked to make a team of 3-4 members and can choose the different categories of projects like desktop applications, web applications, mobile application and distributed application and work once it is approved by the coordinator.

#### **Evaluation:**

Students Assessment through CIE (80%) + SEE (20%)

<b>Continuous Internal Evaluation</b>	<b>Assessment</b>	<b>Marks</b>
	Problem Definition, Literature Review	10
	Synopsis and SRS Deliverables	10
	Design (Module wise algorithmic design)	20
	Coding	10



	Integration and testing	10
	Report	10
	Presentation skills and Viva-voce	10
	<b>Total</b>	<b>80</b>
<b>Semester End Examination</b>	Presentation	10
	Viva-voce	10
	<b>Total</b>	<b>100</b>

16ECAE903

Information Security

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: 16ECAE903

Course Title: **Information Security**

L-T-P:**3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks: **50 + 100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **42 + 24**

Exam Duration: **3 Hours**

No	Content	Hrs
<b>Unit I</b>		
<b>1</b>	<b>Chapter 1: Cryptography Basics</b> Introduction, Classic Crypto: Modern Crypto, Taxonomy of Cryptography & Cryptanalysis	<b>4 Hrs</b>
<b>2</b>	<b>Chapter 2: Symmetric Key Crypto</b> Introduction, Stream Ciphers, Block Ciphers, Block cipher modes	<b>6 Hrs</b>
<b>3</b>	<b>Chapter 3: Public Key Crypto and Hash Functions</b> Introduction, Knapsack, RSA, Diffie-Hellman, Elliptic Curve Cryptography, Public Key Notation, Uses for Public Key Crypto, Public Key Infrastructure Hash Functions: Introduction, The Birthday Problem, Non-Cryptographic Hashes, Tiger Hash, HMAC	<b>6 Hrs</b>
<b>Unit II</b>		
<b>4</b>	<b>Chapter 4: Authentication and Authorization</b> Authentication: Introduction, Authentication Methods, Passwords, Biometrics, Two-Factor Authentication, Single Sign-On and Web Cookies, Authorization: Introduction, Access Control Matrix, Multilevel Security Models	<b>4 Hrs</b>
<b>5</b>	<b>Chapter 5: Authorization and Authentication Protocols</b> Authorization: Multilateral Security, Firewalls, Intrusion Detection, Simple Authentication Protocols: Introduction, Simple Security Protocols, Authentication Protocols	<b>6 Hrs</b>



**6 Chapter 6: Security Protocols 6 Hrs**

Service-orientation and contemporary SOA; Service layer abstraction; Application service layer; Business service layer, Orchestration service layer; Agnostic services; Service layer configuration scenarios.

**Unit – III**

**7 Chapter 6: Software Flaws and Malware 5 Hrs**

Introduction, Software Flaws, Malware, Miscellaneous Software Based Attacks, software tamper resistance, Digital Rights Management.

**8 Chapter 6: Cyber Crimes and Laws 5 Hrs**

Introduction, Computer Forensics, Online Investigative tool, tracing and recovering electronic evidence, Internet fraud, Identity Theft, Industrial Espionage, Cyber Terrorism. Indian IT laws: Introduction and briefs of Law clauses.

Text Book:

1. Mark Stamp, "Information Security: Principles and Practices", 2nd Edition, John Wiley and Sons, 2011.

References:

1. Michael E. Whitman and Herbert J. Mattord, "Principles of Information Security", 2nd Edition, Thompson, 2005.
2. William Stallings, "Network Security Essentials Applications and Standards", Person Education, 2000.
3. Behrouz A. Forouzan, "Cryptography and Network Security", Tata McGraw-Hill, 2007.

**Evaluation Scheme**

**1. In Semester Assessment (ISA)**

Assessment	Marks
ISA- 1	20
ISA- 2	20
Assignment	10
<b>Total</b>	<b>50</b>

**2. End Semester Assessment (ESA)**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2,3	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4,5,6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7,8	Any 1 question is to be answered



16ECAE905

Wireless & Mobile Computing

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: 16ECAE905

Course Title: **Wireless & Mobile Computing**

L-T-P:**3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks: **50 + 100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **42 + 24**

Exam Duration: **3 Hours**

No	Content	Hrs
	<b>Unit I</b>	
<b>1</b>	<b>Chapter1:Introduction</b>  Mobility Of Bits & Bytes, Wireless-The Beginning, Mobile Computing, Dialog Control, Networks, Middle Gear & Gateways, Applications & Services, Developing Mobile Computing Applications, Security In Mobile Computing, Standard And Standard Bodies And Players In The Wireless Space.	<b>4 Hrs</b>
<b>2</b>	<b>Chapter 2 : Wireless LAN</b>  Introduction, Wireless LAN advantages, IEEE 802.11 standards, Wireless LAN architectures, Mobility in Wireless LAN, Deploying Wireless LAN, Mobile adhoc Networks and Sensor Networks. Wireless LAN security, WiFi versus 3G.	<b>4 Hrs</b>
<b>3</b>	<b>Chapter 3: Mobile Computing Architecture</b>  History of computers, History of Internet, Internet-the ubiquities networks, Architecture for mobile computing, The three-tier architectures, Design consideration for mobile computing, Mobile computing through internet, Making existing applications mobile enable.	<b>4 Hrs</b>
<b>4</b>	<b>Chapter 4: Mobile Computing through Telephony</b>  Evaluation of telephony, Multiple access procedure, Mobile computing through telephone, Developing an IVR application, Voice XML, Telephony application Programming Interphase(TAPI).	<b>4 Hrs</b>
	<b>Unit II</b>	
<b>5</b>	<b>Chapter 5:Emerging Technologies</b>  Introduction, Blue-tooth, Radio Frequency Identification (RFID), Wireless Broad Band (WiMAX), Mobile IP, Internet protocol Ver 6 (IP v6), Java card.	<b>4 Hrs</b>
<b>6</b>	<b>Chapter 6 : Global System for Mobile Communication (GSM)</b>	<b>4 Hrs</b>



Introduction, GSM architectures, GSM entities, Call routing in GSM, PLMN interface, GSM address and identifiers, Network aspect in GSM, GSM frequency allocation, Authentication and security,

**7 Chapter 7: Short Message Services (SMS) 4 Hrs**

Mobile Computing over SMS, Short Message Services (SMS), Value Added Services through SMS, Accessing the SMS Bearer.

**8 Chapter 8: General Packet Radio Service (GPRS) Introduction, GPRS and packet data network, GPRS network architecture, GPRS network operation, Data services in GPRS, Application for GPRS, Limitation of GPRS, Billing and Charging in GPRS. 4 Hrs**

**Unit – III**

**9 Chapter 09 : Wireless Application Protocol (WAP) 5 Hrs**  
Introduction, WAP, MMS, GPRS, Application

**10 Chapter 10 : CDMA & 3G 5 Hrs**  
Introduction, Spread Spectrum technology, IS-95, CDMA vs GSM, Wireless Data, 3rd generation network, Application on 3G.

Text Book:

1. Asoke K Talukder & Roopa R Yavagal . Mobile Computing , Tata McGraw Hill Education Private Limited, New Delhi.

References:

1. Raj Kamal , Mobile Computing, Oxford University Press

**Evaluation Scheme**

**1. In Semester Assessment (ISA)**

Assessment	Marks
ISA- 1	20
ISA- 2	20
Assignments	10
<b>Total</b>	<b>50</b>

**2. End Semester Assessment (ESA)**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2,3,4	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	5,6,7,8	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	9,10	Any 1 question is to be answered



16ECAP902	Project Work																												
<p><b>Program: MASTER OF COMPUTER APPLICATIONS</b></p> <table border="1"> <tr> <td>Course Code: <b>16ECAP902</b></td> <td colspan="2">Course Title: <b>Project Work</b></td> </tr> <tr> <td>L-T-P: <b>0-0-18</b></td> <td>Credits: <b>18</b></td> <td>Contact Hrs: <b>Full Time</b></td> </tr> <tr> <td>ISA Marks: <b>100</b></td> <td>ESA Marks: <b>100+50</b></td> <td>Total Marks: <b>250</b></td> </tr> <tr> <td>Teaching Hrs: <b>Full Time</b></td> <td colspan="2">Exam Duration: <b>3 Hours</b></td> </tr> </table> <p>A student must carry out a project on any domain using cutting edge technologies and demonstrates the same at the end of the semester.</p>			Course Code: <b>16ECAP902</b>	Course Title: <b>Project Work</b>		L-T-P: <b>0-0-18</b>	Credits: <b>18</b>	Contact Hrs: <b>Full Time</b>	ISA Marks: <b>100</b>	ESA Marks: <b>100+50</b>	Total Marks: <b>250</b>	Teaching Hrs: <b>Full Time</b>	Exam Duration: <b>3 Hours</b>																
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2019-20																													
19ECAH701	Professional Communication																												
<p>Course Code: <b>19ECAH701</b>                      Course Title: <b>Professional Communication</b></p> <p>L-T-P: <b>2-1-0</b>                                      Credits: <b>3</b>                                              Contact Hrs: <b>4</b></p> <p>ISA Marks: <b>50</b>                                      ESA Marks: <b>50</b>                                              Total Marks: <b>100</b></p> <p>Teaching Hrs: <b>50</b>                                                                                              Exam Duration: <b>3Hrs</b></p> <table border="1"> <thead> <tr> <th>No</th> <th>Content</th> <th>Hrs</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;"><b>Unit I</b></td> </tr> <tr> <td><b>1</b></td> <td><b>Chapter 1 : Basics of Technical Communication</b></td> <td><b>4 Hrs</b></td> </tr> <tr> <td></td> <td>Introduction, Process of Communication, Language as a Tool, Levels of Communication Levels of Communication, Communication Networks, Importance of Technical Communications.</td> <td></td> </tr> <tr> <td><b>2</b></td> <td><b>Chapter 2 : Barriers to Communication</b></td> <td><b>4 Hrs</b></td> </tr> <tr> <td></td> <td>Definition of Noise, Classification of Barriers.</td> <td></td> </tr> <tr> <td><b>3</b></td> <td><b>Chapter 3 : Technology in Communication</b></td> <td><b>4 Hrs</b></td> </tr> <tr> <td></td> <td>Impact of Technology, Software for Creating Messages, Software for Writing Documents, Software for Presenting Documents, Transmitting Documents, Effective use of Available Technology.</td> <td></td> </tr> <tr> <td><b>4</b></td> <td><b>Chapter 4 : Active Listening</b></td> <td><b>4 Hrs</b></td> </tr> </tbody> </table>			No	Content	Hrs	<b>Unit I</b>			<b>1</b>	<b>Chapter 1 : Basics of Technical Communication</b>	<b>4 Hrs</b>		Introduction, Process of Communication, Language as a Tool, Levels of Communication Levels of Communication, Communication Networks, Importance of Technical Communications.		<b>2</b>	<b>Chapter 2 : Barriers to Communication</b>	<b>4 Hrs</b>		Definition of Noise, Classification of Barriers.		<b>3</b>	<b>Chapter 3 : Technology in Communication</b>	<b>4 Hrs</b>		Impact of Technology, Software for Creating Messages, Software for Writing Documents, Software for Presenting Documents, Transmitting Documents, Effective use of Available Technology.		<b>4</b>	<b>Chapter 4 : Active Listening</b>	<b>4 Hrs</b>
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Introduction, Types of Listening, Traits of good Listener, Active versus passive listening, implications of effective listening.

**5 Chapter 5 : Effective Presentation Strategies 4 Hrs**

Introduction, Defining purpose, Analyzing Audience and Locale, Organizing Contents, preparing outline, Visual Aids, Understanding Nuances of Delivery, Kinesics, Proxemics, Paralinguistic's, Chronemics, Sample speech.

**Unit II**

**6 Chapter 6 : Group Communication 4 Hrs**

Introduction, Group Discussion, Organizational Group discussion, Group discussion as part of selection process Meetings, conferences.

**7 Chapter 7 : Words and Phrases 4 Hrs**

Brief History of words, Dictionary, Thesaurus, Elements of Style, Guidelines for effectiveness.

**8 Chapter 8 : Sentence Construction 4 Hrs**

Introduction, Guidelines for effectiveness.

**9 Chapter 9 : Paragraph Development 4 Hrs**

Introduction, Central Components of a paragraph, Length, Techniques for Paragraph Development.

**10 Chapter 10 :The Art of Condensation 4 Hrs**

Introduction, Steps to effective precise writing.

**Unit – III**

**11 Chapter 11: Letters and Emails 5 Hrs**

Business letters Emails.

**12 Chapter 12: Research paper, Dissertation and Thesis 5 Hrs**

Introduction, Research paper, Dissertation, Thesis.

Text Book:

1. Meenakshi Raman and Sangeeta Sharma, Technical Communication Principles and Practices, Oxford University Press, 2015, 3<sup>rd</sup> Edition,

References:

1. Rizivi, M.A., Effective Technical Communication, Tata McGraw Hill,

**Evaluation Scheme**

**1. In Semester Assessment (ISA)**

Assessment	Marks
ISA- 1	20



ISA- 2	20
Assignment	10
<b>Total</b>	<b>50</b>

## 2. End Semester Assessment (ESA)

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2, 3, 4, 5	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	6, 7, 8, 9, 10	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	11,12	Any 1 question is to be answered

19ECAP706

Computer Networks Lab

Course Code:19ECAP706

Course Title: **Computer Networks Lab.**

L-T-P:0-0-1.5

Credits: 1.5

Contact Hrs:3

ISA Marks:: **100**

ESA Marks: --

Total Marks: **100**

Teaching Hrs: **36**

Exam Duration: **3 Hours**

#	Lab Assignment	No. of Lab slots per Batch(Estimate)
01	Introduction to hardware components and Ethernet LAN setup.	2
02	Investigation of IP addressing and subnet design.	1
03	Application of Windows OS Built-in Networks Diagnostic Tools.	2
04	Network Packet Monitoring and Analysis.	1
05	Analysis of the Data Link Layer Protocols (Ethernet, ARP)	1
06	Analysis of the Web Protocols (DNS, HTTP)	1
07	Analysis of the Email Protocols (SMTP, POP3)	1
08	Computer Network Routing Using Static Routes and RIP Protocol	1
09	Computer Network Routing by Using Open shortest Path First (OSPF) Dynamic Routing Protocol.	1
10	Getting acquainted with switching environment	1



(01FM18MCAXX)

18ECAP801

Mini Project -1

Course Code: **18ECAP801**

Course Title: **Mini Project - 1**

L-T-P: **0-0-2**

Credits: **2**

Contact Hrs: **4**

ISA Marks: **100**

ESA Marks: **100**

Total Marks: **200**

Teaching Hrs: **48**

Exam Duration: **3 Hours**

**Theme: "Development of Rich Internet Applications using PHP"**

Rich Internet Applications (RIAs) are web applications that offer the responsiveness, "rich" features and functionality approaching that of desktop applications. This course provides an end-to-end look at building Rich Internet Applications that employ HTML5, Ajax, jQuery, etc. This course provides platform for integrating various server-side and client-side technologies to create a robust applications.

**Purpose:**

- Developing rich reporting and analytics interfaces for enterprise-level information presentation.
- To build state-of-the-art web applications utilizing the powerful features provided by the combination of the PHP language, Ajax, and Web Services.
- To provide an authoritative overview to a set of key technologies for building web applications (HTML, HTML5, JavaScript, Dynamic HTML, CSS, ASP, AJAX, and XML).
- Able to apply the above key technologies for developing light-weighted and rich-content Web applications
- To offer users a better visual experience and more interactivity than traditional browser applications that use only HTML and HTTP.
- To create advanced user interfaces.

**Evaluation:**

Students Assessment through ISA (100%) + ESA (100%)

In Semester Assessment	Assessment	Marks
	Problem Definition, Literature Review	10
	Synopsis and SRS Deliverables	10
	Design (Module wise algorithmic design)	20
	Coding	10
	Integration and testing	10
	Report	20
	Presentation skills and Viva-voce	20



	<b>Total</b>	<b>100</b>
<b>End Semester Assessment</b>	Presentation	50
	Viva-voce	50
	<b>Total</b>	<b>100</b>

18ECAE806	Cyber Security and Forensics
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Course Code: **18ECAE806**

Course Title: **Cyber Security and Forensics**

L-T-P: **2-0-1**

Credits: **3**

Contact Hrs: **4**

ISA Marks: **50**

ESA Marks: **50**

Total Marks: **100**

Teaching Hrs: **42+24**

Exam Duration: **3Hrs**

No	Content	Hrs
<b>Unit I</b>		
<b>1</b>	<b>Chapter 1: Introduction to Cybercrime, Cyber offenses &amp; Cybercrime</b> Cybercrime definition and origins of the world, Cybercrime and information security, Classifications of cybercrime, A global Perspective on cybercrimes. Cyber attack plans, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets, Proliferation of Mobile and Wireless Devices, Credit Card Frauds in Mobile and Wireless Computing Era.	<b>8 Hrs</b>
<b>2</b>	<b>Chapter No. 2. Methods used in Cybercrime</b> Phishing, password Cracking, Keyloggers and Spyware, Virus and Worms, Trojan and backdoors, Steganography, DOS and DDOS attack, SQL injection, Buffer Overflow, Attack on wireless networks, Identity theft.	<b>8 Hrs</b>
<b>Unit II</b>		
<b>3</b>	<b>Cybercrimes and Cyber security: The Legal Perspectives</b> Why do we need Cyber law: The Indian Context, The Indian IT Act, Digital Signature and the Indian IT Act, Amendments to the Indian IT Act, Cybercrime and Punishment.	<b>8 Hrs</b>
<b>4</b>	<b>Chapter 4: Understanding computer Forensics, Forensics of Hand-held devices</b> Historical background of forensics; Digital forensics science; need for computer forensics; cyber forensics and digital evidence; Analysis E-mail; Digital forensics life cycle; chain of custody concepts; network forensics; Forensics and social networking; challenges in computer forensics; Hand-held devices and digital forensics; Toolkits for Hand-held device forensics; Techno-legal challenges form hand-held devices	<b>8 Hrs</b>
<b>Unit – III</b>		
<b>5</b>	<b>Chapter 5: Social, political, Ethical and Psychological Dimensions</b> Intellectual property in the cyberspace; Ethical dimension of cybercrimes; Psychology, mindset and skills of hackers and other cybercriminals; Sociology of cybercriminals.	<b>5 Hrs</b>



**6 Chapter 6: Cybercrime: Illustrations, Examples and Case studies**

**5 Hrs**

Introduction, Real-Life Examples, Case Studies: Illustrations of Financial Frauds in Cyber Domain, Digital Signature-Related Crime Scenarios, Digital forensics case illustrations Online Scams.

Text Book

1. Nina Godbole & Sunit Belapure, "Cyber Security", Wiley India, 2011 and Reprint 2018.

References

1. Dhiren R Patel, "Information security theory & practice", PHI learning PVT. Ltd, 2010.
2. Bill Nelson, "Guide to Computer Forensics and Investigations", 4th Edition, CENGAGE Publication. 2009

**Evaluation Scheme**

**In Semester Assessment (ISA)**

Assessment	Theory
ISA- 1	15
ISA- 2	15
Lab practices	20
<b>Total</b>	<b>50</b>

**End Semester Assessment (ESA)**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	3,4	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	5,6	Any 1 question is to be answered



Proposed Cyber Security and Forensics Practices		
S No	Practices	Tools
1	Implementation of SQL Injection and avoidance	Python Php Tools (Crime, Security or Forensics)
2	Implementation of Digital signature	
3	Implementation of .Steganography	
4	Writing Literature survey report on various issues in Cybersecurity and Forensics	
5	Presentation on domain chosen in Cybercrime, Cyber security or Cyber Forensics.	
6	Demonstration of tool/s used in Cybercrime, Cyber Security or Cyber Forensics	

18ECAE804	Cloud Computing
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Course Code: **18ECAE804**

Course Title: **Cloud Computing**

L-T-P:**2-0-1**

Credits: **3**

Contact Hrs: **4**

ISA Marks: **50**

ESA Marks: **50**

Total Marks: **100**

Teaching Hrs: **42 + 24**

Exam Duration: **3 Hours**

No	Content	Hrs
<b>Unit I</b>		
<b>1</b>	<b>Chapter 1: Introduction, Parallel and distributed systems</b> Network-centric computing and network centric content, peer-to-peer systems, Cloud computing basics, delivery models and services, Ethical issues, cloud vulnerabilities, major challenges; parallel computing, parallel computer architecture, Distributed systems, communication protocol and process coordination, logical clocks, message delivery rules, casual delivery, Concurrency, atomic actions, consensus protocols, modularity: client-server paradigm.	<b>6 Hrs</b>
<b>2</b>	<b>Chapter 2: Cloud Infrastructure</b> Cloud computing at Amazon, cloud computing: the Google perspective, Microsoft windows Azure and online services; open-source software platforms for private clouds; Cloud storage diversity and vendor lock-in; Cloud computing interoperability: the intercloud; Energy use and ecological impact of large-scale data centers; Service and compliance level agreements; User experience; Software licensing.	<b>6 Hrs</b>
<b>3</b>	<b>Chapter 3: Cloud Computing: Applications and Paradigms</b> Challenges for cloud computing; Existing cloud applications and new application opportunities; Architectural styles for cloud applications; Workflows: Coordination of multiple activities; The MapReduce programming model; Case studies.	<b>4 Hrs</b>



**Unit II**

**4 Chapter 4: Cloud Resource Virtualization 6 Hrs**

Virtualization; Layering and virtualization; Virtual machine monitors; Virtual machines; Performance and security isolation; Full virtualization and Para virtualization; Hardware support for virtualization; Case study; Optimization of network virtualization; vBlades; A performance comparison of virtual machines; Software fault isolation;

**5 Chapter 5: Cloud Resource Management and Scheduling 6 Hrs**

Policies and mechanisms for resource management; Applications of control theory to task scheduling on a cloud; Stability of a two-level resource allocation architecture; Feedback control based on dynamic thresholds; Coordination of specialized autonomic performance managers; A utility-based model for cloud-based web services; Resource bundling; Scheduling algorithms for computing clouds; Fair queuing; Resource management and dynamic application scaling.

**6 Chapter 6: Networking Support 4 Hrs**

Packet-switched networks; The Internet; Internet migration to IPV6; The transformation of the Internet; Web access and the TCP congestion control window; Network resource management; Interconnection networks for computer clouds; Content-delivery networks; Overlay networks and small-world networks.

**Unit – III**

**7 Chapter 7: Storage Systems 5 Hrs**

The evolution of storage technology; Storage models, file systems and databases; Distributed file systems: The precursors; General parallel file system; Google File System; Apache Hadoop; Locks and Chubby: A locking service; Transaction processing and NoSQL and databases; BigTable; Megastore.

**8 Chapter 8: Cloud Security 5 Hrs**

Cloud security risks; Security: The top concern for cloud users; Privacy and privacy impact assessment; Trust; Operating system security; Virtual machine security; Security of virtualization; Security risks posed by shared images; Security risks posed by a management OS; A trusted virtual machine monitor.

Text Book:

1. A Dan C. Marinescu, Cloud Computing: Theory and Practice, Morgan Kaufmann publishers, 2013

**References**

- 1 Michael Miller, Cloud Computing: Web-Based Applications that change the Way you work and collaborate Online, Pearson Publication, 2012.
- 2 Anthony T. Volte, Toby J. Volte, Robert Elsenpeter: Cloud Computing, A Practical Approach, McGraw Hill, 2010.
- 3 Cloud Computing for Dummies: J. Hurwitz, ISBN 978-0-470-484-8
- 4 Dr. Kumar Sourabh, Cloud Computing, 2nd Edition, Wiley India, 2011.



**Evaluation Scheme**

**Assessment**

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

**End Semester Assessment (ESA) Pattern:**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2,3	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4,5,6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7,8	Any 1 question is to be answered

**Cloud Computing Practices**

<i>Expt No.</i>	<i>Brief description about the experiment</i>	<i>Number Of Slots</i>
<b>DEMONSTRATION</b>		
1	Cloud computing resources access using Windows Azure Infrastructure Services	1
2	Registering a DNS Server in Windows Azure	1
3	Introduction to Google app engine for Java.	1
4	Creation an Amazon VPC.	1
5	Setting up Routing in VPC and Deploying Amazon EC2 instance in Amazon VPC	1
<b>EXERCISE</b>		
6	Introduction of cloud using windows Azure.	1
7	Collaborating on Calendars Schedules and Task Management, Event Management, Contact Management, Project Management, Word Processing, Spreadsheets, Databases, Presentations.	1
8	Implementation of web app on Google app engine.	1
9	Implementation of Amazon VPC.	1
10	Implementation of network programming using mininet.	1





11	Collaborating via Web Based Communication Tools, Social Networks and Groupware, Blogs and Wikis.	1
<b>STRUCTURED ENQUIRY</b>		
12	Develop a tree topology structure with more than 20 hosts using controller and switches in mininet.	2

18ECAP802	Mini Project-2
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Course Code: **18ECAP802**

Course Title: **Mini Project-2**

L-T-P: **0-0-2**

Credits: **2**

Contact Hrs: **4**

ISA Marks: **100**

ESA Marks: **100**

Total Marks: **200**

Teaching Hrs: **48.**

Exam Duration: **3 Hours**

**Theme: “Mini project Using Java/Python”**

Java is one of the fundamental programming languages that can be used in many applications as well as product developments. The simple reason for this is because Java can be put to use in various platforms due to its multi-platform nature. Java is one of the favorite choices for developers for many reasons like security, object oriented(reusability), cross platform computing, multithreaded capability, Rich API, Powerful development tools ,availability of various frameworks, Great collection of open source libraries, wonderful community support, Excellent documentation support. Support for various databases and many more.

Students can use the following tools in web and mobile applications as well as product developments:

- Struts, Spring, Hibernate and JPA
- JAXB and Apache Axis 2/Java
- JSP, Servlets, JDBC, EJB, JMS, JTA and JUnit
- Apache Tomcat, JBoss and GlassFish
- JavaScript, JSF, GWT and jQuery
- Eclipse, Netbeans and JBoss tools
- TestNG
- jBPM and Drools
- JCR

**Objectives:**

Help students to utilize and strengthen the knowledge of java which they have learnt in previous semester.

**Python :**

Python is an interpreted, high-level, general-purpose programming language. Python has a design philosophy that emphasizes code readability, notably using significant whitespace. It provides constructs



that enable clear programming on both small and large scales, Python features a dynamic type system and automatic memory management. It supports multiple programming paradigms, including object-oriented, imperative, functional and procedural. It also has a comprehensive standard library. Python interpreters are available for many operating systems. CPython, the reference implementation of Python, is open source software and has a community-based development model.

Students can use the following tools in web and product developments:

- Django
- BootStarp
- Matplotlib
- Reportlab
- Numpy
- Pandas
- Falcon

**Objectives:**

Help students to utilize and strengthen the knowledge of python which they have learnt in previous semester.

**Methodology:**

Students are asked to make a team of 3-4 members and can choose the different categories of projects like desktop applications, web applications, mobile application and distributed application and work once it is approved by the coordinator.

**Assessment:**

Students Assessment through ISA (100%) + ESA(100%)

In Semester Assessment	Assessment	Marks
	Problem Definition, Literature Review	10
	Synopsis and SRS Deliverables	10
	Design (Module wise algorithmic design)	20
	Coding	10
	Integration and testing	10
	Report	20
	Presentation skills and Viva-voce	20
	<b>Total</b>	<b>100</b>
End Semester Assessment	Presentation	50
	Viva-voce	50
	<b>Total</b>	<b>100</b>



18ECAE802

User Interface Design

Course Code:18ECAE802

Course Title: **User Interface Design**

L-T-P: **2-0-1**

Credits: **3**

Contact Hrs: **4**

ISA Marks: **50**

ESA Marks: **50**

Total Marks: **100**

Teaching Hrs: **42+24**

Exam Duration:**3Hrs**

No	Content	Hrs
	<b>Unit I</b>	
<b>1</b>	<b>Chapter 1 : What Users Do</b>	<b>5Hrs</b>
	The Basics of User Research ,Users' Motivation to Learn, The Patterns.	
<b>2</b>	<b>Chapter 2 : Organizing the Content: Information Architecture and Application Structure</b>	<b>6 Hrs</b>
	The Big Picture, The Patterns:- Feature, Search, and Browse, News Stream, Picture Manager, Dashboard, Canvas Plus Palette, Wizard.	
<b>3</b>	<b>Chapter 3 : Getting Around: Navigation, Signposts, and Wayfinding</b>	<b>6 Hrs</b>
	Staying Found, The Cost of Navigation, Navigational Models, Design Conventions for Websites, The Patterns:- Clear Entry Points, Menu Page, Pyramid, Modal Panel, Deep-linked State, Escape Hatch, Fat Menus, Sitemap Footer, Sign-in Tools, Sequence Map, Breadcrumbs, Annotated Scrollbar, Animated Transition.	
	<b>Unit II</b>	
<b>4</b>	<b>Chapter 4 : Organizing the Page: Layout of Page Elements</b>	<b>5 Hrs</b>
	The Basics of Page Layout, The Patterns:- Visual Framework, Center Stage, Grid of Equals, Titled Sections, Module Tabs, Collapsible Panels, Movable Panels, Right/Left Alignment, Diagonal Balance.	
<b>5</b>	<b>Chapter 5 : _Lists of Things</b>	<b>6 Hrs</b>



Use Cases for Lists, Back to Information Architecture, The Patterns:- Two-Panel Selector, One-Window Drilldown, List Inlay, Thumbnail Grid, Row Striping, Jump to Item, Cascading Lists, Tree Table.

**6 Chapter 6 : Doing Things: Actions and Commands 6 Hrs**

Pushing the Boundaries, The Patterns:- Button Groups, Hover Tools, Action Panel, Smart Menu Items, Preview, Progress Indicator, Macros.

**Unit – III**

**7 Chapter 7: Showing Complex Data: Trees, Charts, and Other Information Graphics 4 Hrs**

The Basics of Information Graphics, The Patterns:- Overview Plus Detail, Datatips, Data Spotlight, Dynamic Queries, Data Brushing, Local Zooming, Sortable Table, Radial Table, Multi-Y Graph, Small Multiples, Treemap.

**8 Chapter 8: Getting Input from Users: Forms and Controls 4 Hrs**

The Basics of Form Design, Control Choice, The Patterns:- Forgiving Format, Structured Format, Fill-in-the-Blanks, Input Hints, Input Prompt, Password Strength Meter, Autocompletion, Dropdown Chooser, Same-Page Error Messages.

Text Book:

1. Jenifer Tidwell , Designing Interfaces, 2nd Edition, O'Reilly ,2010

References:

1. Jodie Moule., Killer UX Design, SitePoint,2012

**Evaluation Scheme**

**In Semester Assessment (ISA)**

Assessment	Marks
ISA- 1	20
ISA- 2	20
Assignment	10
<b>Total</b>	<b>50</b>

**End Semester Assessment (ESA)**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2, 3	Any 2 questions are to be answered



II	3 Questions to be set of 20 Marks Each	4,5,6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7,8	Any 1 question is to be answered

**User Interface Design Practices**

Sl.No	Activity	Hours
1	Find two examples of user interfaces (might be desktop software, web applications, smartphone apps, consumer devices, car dashboards, building entrances, traffic intersections, shower controls, etc), one that you consider a good design and one that you consider a bad design. For each interface, you should: <ul style="list-style-type: none"> <li>Describe its purpose intended users.</li> <li>Analyze its good and bad points of usability with reference to all the dimensions of usability (learnability, visibility, efficiency, errors)</li> </ul> Illustrate your analysis with appropriate screenshots or photographs.	2
2	Design a user interface for a specific task that communicates its conceptual model to the user more effectively, so that users are less likely to make this mistake. Sketch your ideas (alternate designs) on a whiteboard. Critique it, and update the designs.	2
3	Guided by the categories below, make a list of what needs to be made visible, and then brainstorm (and sketch) how the interface might make it visible. <ul style="list-style-type: none"> <li>Actions: what can the user do?</li> <li>State: what is the current state of the system?</li> <li>Feedback: what was the effect of the user's actions</li> </ul>	2
4	Explore the undo models used in single-user text editing. Choose a few different kinds of textboxes. Experiment with a web browser's undo model for text editing by typing, deleting, changing properties, and using Undo. Try to figure out: <ul style="list-style-type: none"> <li>How many undo streams are there—one, or many?</li> <li>How is the history divided into undoable units?</li> <li>How much previous state is recovered when you undo? (Selections? cursor positions?)</li> <li>What visible feedback does Undo give? (e.g., if the Undo affects a location scrolled out of the box?)</li> </ul>	2
5	User-centered design process, by conducting a lightweight UCD process on a few problems in the classroom.	2
6	User Analysis, Task Analysis, Domain Analysis by observing a real environment of people working.	2
7	Designing UIs by sketching.	2
8	Exploring some of the main structuring patterns of GUI software: the view tree, listeners, and model-view-controller using HTML, Javascript, and jQuery, along with a handy online HTML editor.	2
9	Explore about low-fidelity prototyping by creating a simple, hand-drawn prototype in less than 5 minutes, and simulating it with another user.	2



10	Information visualization by experimenting with modifications to an existing visualization using a browser.	2
11	Exploring some of the principles and pitfalls of color design and typography.	2
12	Heuristic evaluation of an e-commerce web site. Record the usability problems found. Justify every observation by naming one or more usability heuristics (design principles) that it violates. Assign a severity rating to each problem (cosmetic, minor, major, or catastrophic). Include at least one positive usability comment, again justifying it by naming one or more heuristics.	2

17ECAE803

Digital Image Processing

**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **18ECAE803**

Course Title: **Digital Image Processing**

L-T-P: **2-0-1**

Credits: **3**

Contact Hrs: **4**

ISA Marks-Theory: **50** +Practice: **100**

ESA Marks: **50**

Total Marks: **200**

Teaching Hrs: **42 + 24**

Exam Duration: **3 Hours**

No	Content	Hrs
<b>Unit I</b>		
<b>1</b>	<b>Chapter No. 1- Digital Image Fundamentals</b> Introduction: Origins of digital image processing, Electromagnetic spectrum, Applications, Components of image processing system, Image sensing and acquisition, Digitization, Sampling and Quantization	<b>4 Hrs</b>
<b>2</b>	<b>Chapter No. 2- Intensity Transformations and Spatial Filtering</b> Image Enhancement: Basic gray level transformations, histogram processing, enhancement using arithmetic/ logic operations, basics of spatial filtering, smoothing and sharpening spatial filters.	<b>6 Hrs</b>
<b>3</b>	<b>Chapter No. 3- Filtering in the frequency domain</b> Frequency domain: introduction to the Fourier transform and the Frequency domain, smoothing and sharpening frequency domain filters, Discrete Fourier transforms, Properties of DFT, FFT	<b>6 Hrs</b>
<b>Unit II</b>		
<b>4</b>	<b>Chapter No. 4- Image Restoration and Reconstruction</b> A model of the image degradation/restoration process, noise models, Spatial Filtering- mean filters, order static filters, adaptive filters	<b>10Hrs</b>
<b>5</b>	<b>Chapter No. 5- Color Image Processing</b> Color models, pseudo color image processing, smoothing and sharpening.	<b>6 Hrs</b>
<b>Unit – III</b>		



**6 Chapter No. 6- Morphological Image Processing**

**5 Hrs**

Introduction, structuring elements, dilation and erosion, opening and closing, Hit-or-Miss transformation, basic morphological algorithms

**7 Chapter No. 7- Image Segmentation**

**5 Hrs**

Detection of discontinuities, edge linking and boundary detection, Thresholding, Region based approach, segmentation by morphological watersheds

Text Book:

3. Rafael.C.Gonzalez, Richard.E.Woods, Digital Image Processing, Pearson, 3<sup>rd</sup> Edition, 2008.
4. [http://opencv-python-tutroals.readthedocs.io/en/latest/py\\_tutorials/py\\_imgproc/py\\_table\\_of\\_contents\\_imgproc/py\\_table\\_of\\_contents\\_imgproc.html](http://opencv-python-tutroals.readthedocs.io/en/latest/py_tutorials/py_imgproc/py_table_of_contents_imgproc/py_table_of_contents_imgproc.html)

**DIP Practices using Python**

**COURSE DESCRIPTION:**

Computer vision is the automated extraction of information from images. Information can mean anything from 3D models, camera position, object detection and recognition to grouping and searching image content. This course provide hands-on programming practices and introduces basic tools for working with images using python OpenCV library.

**OBJECTIVES**

- To provide hands-on programming with images using Python.
- To demonstrate computer vision techniques behind a wide variety of real-world applications.
- To implement many of the fundamental algorithms using OpenCV library.

**LAB REQUIREMENTS:**

- Computer with latest configuration having Windows and Linux OS Versions.
- Python with OpenCV Library installed.



**LIST OF EXERCISES**

Expt./ Job No.	Lab assignments/experiment	Implementation	Number of Hours
1.	Changing Colorspaces	Learn to change images between different color spaces. Plus learn to track a colored object in a video.	1
2.	Geometric Transformations of Images :	Learn to apply different geometric transformations to images like rotation, translation etc.	
3.	Image Thresholding :	Learn to convert images to binary images using global thresholding, Adaptive thresholding, Otsu's binarization etc	1
4.	Smoothing Images:	Learn to blur the images, filter the images with custom kernels etc	
5.	Morphological Transformations	Learn about morphological transformations like Erosion, Dilation, Opening, Closing etc	1
6.	Image Gradients :	Learn to find image gradients, edges etc	
7.	Canny Edge Detection:	Learn to find edges with Canny Edge Detection	
8.	Image Pyramids:	Learn about image pyramids and how to use them for image blending	1
9.	Contours in OpenCV:	All about Contours in OpenCV	
10.	Histograms in OpenCV:	All about histograms in OpenCV	1
11.	Image Transforms in OpenCV:	Meet different Image Transforms in OpenCV like Fourier Transform, Cosine Transform etc.	
12.	Template Matching :	Learn to search for an object in an image using Template Matching	1
13.	Hough Line Transform :	Learn to detect lines in an image	1
14.	Hough Circle Transform:	Learn to detect circles in an image	
15.	Image Segmentation with Watershed Algorithm:	Learn to segment images with watershed segmentation.	1
16.	Interactive Foreground Extraction using GrabCut Algorithm:	Learn to extract foreground with GrabCut algorithm	1

References:

- [https://www.tutorialspoint.com/mongodb/mongodb\\_tutorial.pdf](https://www.tutorialspoint.com/mongodb/mongodb_tutorial.pdf)
- [https://blog.codecentric.de/files/2012/12/MongoDB-CheatSheet-v1\\_0.pdf](https://blog.codecentric.de/files/2012/12/MongoDB-CheatSheet-v1_0.pdf)
- <http://www.guru99.com/mongodb-tutorials.html>





**Evaluation Scheme**

**3. Assessment**

Assessment	Theory	Lab.
ISA- 1	25	100
ISA- 2	25	
ESA	50	00
<b>Total</b>	<b>100</b>	<b>100</b>

**4. End Semester Assessment (ESA) Pattern:**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1,2	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	3,4	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	5,6	Any 1 question is to be answered

18ECAE808

DevOps

Course Code: 18ECAE808

Course Title: **DevOps**

L-T-P: 2-0-1

Credits: 3

Contact Hrs: 4

ISA Marks: 50

ESA Marks: 50

Total Marks: 100

Teaching Hrs: 42+24

Exam Duration: 3Hrs

No	Content	Hrs
<b>Unit I</b>		
<b>1</b>	<b>Chapter 1 : Introduction to DevOps and Continuous Delivery</b> Introducing DevOps, How fast is fast?, The Agile wheel of wheels, Beware the cargo cult Agile fallacy, DevOps and ITIL.	<b>4 Hrs</b>
<b>2</b>	<b>Chapter 2 : A View from Orbit :</b> <b>The DevOps process and Continuous Delivery – an overview :</b> The developers, The revision control system, The build server, The artifact repository, Package managers, Test environments, Staging/production, Release management, Scrum, Kanban, and the delivery pipeline, Wrapping up – a complete example, Identifying bottlenecks	<b>4 Hrs</b>
<b>3</b>	<b>Chapter 3 : How DevOps Affects Architecture</b> Introducing software architecture, The monolithic scenario, Architecture rules of thumb, The separation of concerns, The principle of cohesion, Coupling, Back to the monolithic scenario, A practical example, Three-tier systems, The presentation tier, The logic tier, The data tier, Handling database migrations, Rolling upgrades, Hello world in Liquibase, The changelog file, The pom.xml file, Manual installation,	<b>6 Hrs</b>



Microservices, Interlude – Conway's Law, How to keep service interfaces forward compatible, Microservices and the data tier, DevOps, architecture, and resilience

**4 Chapter 4 : Everything is Code 6 Hrs**

The need for source code control, The history of source code management, Roles and code, Which source code management system? A word about source code management system migrations, Choosing a branching strategy, Branching problem areas, Artifact version naming, Choosing a client, Setting up a basic Git server, Shared authentication, Hosted Git servers, Large binary files, Trying out different Git server implementations, Docker intermission, Gerrit : a ) Installing the git-review package, b) The value of history revisionism, The pull request model, GitLab

**Unit II**

**5 Chapter 5 : Building the Code 6 Hrs**

Why do we build code? The many faces of build systems, The Jenkins build server, Managing build dependencies, The final artifact, Cheating with FPM, Continuous Integration, Continuous Delivery, Jenkins plugins, The host server, Build slaves, Software on the host, Triggers, Job chaining and build pipelines, A look at the Jenkins filesystem layout, Build servers and infrastructure as code, Building by dependency order, Build phases, Alternative build servers, Collating quality measures, About build status visualization, Taking build errors seriously, Robustness

**6 Chapter 6 : Testing the Code 6 Hrs**

Manual testing, Pros and cons with test automation, Unit testing, JUnit in general and JUnit in particular, A JUnit example, Mocking, Test Coverage, Automated integration testing, Docker in automated testing, Arquillian, Performance testing, Automated acceptance testing, Automated GUI testing, Integrating Selenium tests in Jenkins, JavaScript testing, Testing backend integration points, Test-driven development, REPL-driven development, A complete test automation scenario : Manually testing our web application, Running the automated test, 3 Finding a bug, Test walkthrough, Handling tricky dependencies with Docker

**7 Chapter 7 : Deploying the Code 4 Hrs**

Why are there so many deployment systems? Configuring the base OS, Describing clusters, Delivering packages to a system, Virtualization stacks: Executing code on the client, A note about the exercises, The Puppet master and Puppet agents, Ansible, PalletOps, Deploying with Chef, Deploying with SaltStack, Salt versus Ansible versus Puppet versus PalletOps execution models, Vagrant, Deploying with Docker, Comparison tables, Cloud solutions, AWS, Azure.

**8 Chapter 8 : Monitoring the Code 4 Hrs**

Nagios, Munin, Ganglia, Graphite, Log handling, Client-side logging libraries, The ELK stack.

**Unit – III**

**9 Chapter 9 : Issue Tracking 5 Hrs**

What are issue trackers used for? Some examples of workflows and issues, What do we need from an issue tracker? Problems with issue tracker proliferation, All the trackers : Bugzilla, Trac, Redmine, The GitLab issue tracker, Jira



**10 Chapter 10 : The Internet of Things and DevOps**

**5 Hrs**

Introducing the IoT and DevOps, The future of the IoT according to the market, Machine-to-machine communication, IoT deployment affects, software architecture, IoT deployment security, Okay, but what about DevOps and the IoT again?, A hands-on lab with an IoT device for DevOps

**Text Book:**

1. Practical DevOps by Joakim Verona Publisher: Packt Publishing, Release Date: February 2016, ISBN: 9781785882876

References:

1. **Effective DevOps**, Building a Culture of Collaboration, Affinity, and Tooling at Scale , By Jennifer Davis, Ryn Daniels, **Publisher:** O'Reilly Media, **Release Date:** June 2016 , **Pages:** 410.
2. **The DevOps Handbook: How to Create World-Class Speed, Reliability, and Security in Technology Organizations**, Gene Kim, Patrick Debois, John Willis, Jez HumbleIT Revolution Press, 2016 - Business & Economics - 480 pages.

**Evaluation Scheme**

**In Semester Assessment (ISA)**

Assessment	Marks
ISA- 1	20
ISA- 2	20
Assignment	10
<b>Total</b>	<b>50</b>

**End Semester Assessment (ESA)**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2, 3, 4,	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	5, 6, 7, 8,	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	9, 10	Any 1 question is to be answered

**DevOps Practice Exercise:**

The objectives of these practice exercise is to learn DevOps best practices and to define entire infrastructure as code and learn about infrastructure as code, continuous integration, continuous delivery, Terraform, AWS, Packer, Docker, and much more.

- 1) **DevOps basics:** Learn the origins of DevOps and the basic principles and techniques.
- 2) **AWS crash course:** Hands-on session where you learn to use the most important AWS services, including IAM, EC2, ASG, EBS, ELB, S3, and RDS.
- 3) **Infrastructure as code:** Overview of different techniques to manage infrastructure, including ad-hoc scripts (e.g., Bash, Python), configuration management tools (e.g., Chef, Puppet), machine images (e.g., VMs, Docker), and provisioning tools (e.g., Terraform, CloudFormation).



- 4) **Terraform introduction:** Go through a series of coding exercises that cover the basic Terraform syntax, state management, loops, conditionals, lifecycle management, and common gotchas.
- 5) **Advanced Terraform:** Go through a series of coding exercises that cover Terraform modules, file layout, keeping code DRY, team workflows, and automated testing.
- 6) **Immutable infrastructure:** Overview of immutable infrastructure practices, versioning artifacts, promoting artifacts through environments, and deployment.
- 7) **Packer introduction:** Build your own AMIs and other virtual machine images using Packer.
- 8) **Docker introduction:** Create your own Docker images and deploy them using Docker orchestration tools.
- 9) **Continuous delivery:** Learn how to integrate Terraform, Packer, and Docker into a continuous delivery pipeline.
- 10) **DevOps best practices:** Learn about continuous integration, microservices, feature toggles, canary deployments, monitoring, alerting, and log aggregation.
- 11) **Production readiness review:** A Gruntwork engineer goes through a checklist of questions with your team to see what work you need to do to be ready for prod.
- 12) **Architecture deployment:** Deploy your customized Reference Architecture in AWS.
- 13) **Architecture walkthrough:** Overview of how the architecture works and how to use it.
- 14) **Migrating to the new architecture:** Learn the process of migrating your apps and data to the new architecture.

17ECAE902

Full Stack Development - MEAN

Course Code:17ECAE902

Course Title: Full Stack Development - MEAN

L-T-P: 3-0-1

Credits: 4

Contact Hrs: 5

ISA Marks: 50

ESA Marks: 50

Total Marks: 100

Teaching Hrs: 42+24

Exam Duration:3Hrs

No	Content	Hrs
	<b>Unit I</b>	
1	<b>Chapter 1 : Introduction to MEAN</b>  Three-tier web application development, The evolution of JavaScript, Introducing MEAN, Installing MongoDB, Installing Node.js, Introducing NPM.	5 Hrs
2	<b>Chapter 2 : Getting Started with Node.js</b>  Introduction to Node.js, JavaScript closures, Node modules, Developing Node.js web applications.	5 Hrs
3	<b>Chapter 3 : Building an Express Web Application</b>  Introduction to Express, Installing Express, Creating your first Express application, The application, request, and response objects, External middleware, Implementing the MVC pattern, Configuring an Express application, Rendering views, Serving static files, Configuring sessions.	6 Hrs



**Unit II**

- |          |                                                                                                                                                                                                                                                                                                                                                                                       |              |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>4</b> | <b>Chapter 4 : Introduction to MongoDB</b><br>Introduction to NoSQL, Introducing MongoDB , Key features of MongoDB, MongoDB shell, MongoDB databases , MongoDB collections, MongoDB CRUD operations                                                                                                                                                                                   | <b>5 Hrs</b> |
| <b>5</b> | <b>Chapter 5 : Introduction to Mongoose</b><br>Introducing Mongoose, Understanding Mongoose schemas, Extending your Mongoose schema, Defining custom model methods, Model validation, Using Mongoose middleware, Using Mongoose DBRef.                                                                                                                                                | <b>6 Hrs</b> |
| <b>6</b> | <b>Chapter 6 : Managing User Authentication Using Passport</b><br>Introducing Passport, Understanding Passport strategies, Understanding Passport OAuth strategies; <b>Introduction to AngularJS:-</b> Introducing AngularJS, Key concepts of AngularJS, Installing AngularJS, Structuring an AngularJS application, Bootstrapping your AngularJS application, AngularJS MVC entities | <b>6 Hrs</b> |

**Unit – III**

- |          |                                                                                                                                                                                                                                                                                                       |              |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>7</b> | <b>Chapter 7: Creating a MEAN CRUD Module</b><br>Introducing CRUD modules, Setting up the Express components, Introducing the ngResource module, Implementing the AngularJS MVC module, Finalizing your module implementation.                                                                        | <b>4 Hrs</b> |
| <b>8</b> | <b>Chapter 8: Testing MEAN Applications</b><br>Introducing JavaScript testing, Testing your Express application, Testing your AngularJS application; Adding Real-time Functionality Using Socket.io:- Introducing WebSockets, Introducing Socket.io, Installing Socket.io, Building a Socket.io chat. | <b>5 Hrs</b> |

Text Book:

1. Amos Q, Haviv, Mean Web Development, Packt Publishing 2014.

References:

1. COLIN J. IHRIG, Full Stack Javascript Development with MEAN, Sitepoint.

**Evaluation Scheme**

**In Semester Assessment (ISA)**

Assessment	Marks
ISA- 1	20
ISA- 2	20
Assignment	10
<b>Total</b>	<b>50</b>



### End Semester Assessment (ESA)

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2, 3	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4.5.6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7,8	Any 1 question is to be answered

### Practice Experiments for Full Stack

SI No	EXPERIMENT NAME
1	Build a real-time polls application with Node.js, Express, AngularJS, and MongoDB
2	Setting Up a MEAN Stack Single Page Application
3	A Sample App with Node.js, Express and MongoDB
4	REST Service with Web Interface using the MEAN Stack
5	Creating an RSS Feed Reader With the MEAN Stack
6	Create a TV Show Tracker using AngularJS, Node.js and MongoDB
7	Deploying a MEAN App to Amazon EC2

17ECAP901

ASP .Net Lab.

Course Code: 17ECAP901

Course Title: ASP .NET Lab **Lab.**

L-T-P:0-0-1

Credits: 1

Contact Hrs: 2

ISA Marks:: 100

ESA Marks: --

Total Marks: 100

Teaching Hrs: 24

Exam Duration: 3 Hours

Expt./ Job No.	Lab assignments/experiment	No. of Lab. Slots per batch (estimate)
<b>Demonstration</b>		
1	Program to demonstrate ASP.Net Web Forms	01
2	Program to demonstrate validation in ASP.Net	01
3	Program to demonstrate working with Data Base applications.	01



4	Program to demonstrate session tracking in ASP.Net	01																					
	<b>Exercises</b>																						
5	<p>a) Write a program to display a feedback form. The different options for the list box must be ASP-XML, Dot NET, JavaPro and Unix, C, C++. When the Submit Form button is clicked after entering the data, a message must be displayed.</p> <p>b) Write a program containing the following controls:</p> <ol style="list-style-type: none"> <li>a. A List Box</li> <li>b. A Button</li> <li>c. An Image</li> <li>d. A Label</li> </ol> <p>The listbox is used to list items available in a store. When the user clicks on an item in the listbox, its image is displayed in the image control. When the user clicks the button, the cost of the selected item is displayed in the control.</p>	01																					
6	<p>a) Write a program to get a user input such as the boiling point of water and test it to the appropriate value using Compare Validator.</p> <p>b) Declare one TextBox control, one Button control, one Label control, and one RegularExpressionValidator control in an .aspx file. The submit() function checks if the page is valid. If it is valid, it returns "The page is valid!" in the Label control. If it is not valid, it returns "The page is not valid!" in the Label control. If validation fails, the text "The zip code must be 5 numeric digits!" will be displayed in the RegularExpressionValidator control.</p>	01																					
7	<p><b>I.</b> Create table CANDIDATE with the following</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Column name</th> <th>Datatype</th> </tr> </thead> <tbody> <tr> <td>Ccode</td> <td>Int</td> </tr> <tr> <td>Name</td> <td>Char(20)</td> </tr> <tr> <td>DOJ</td> <td>Date</td> </tr> </tbody> </table> <p>i) Insert following records into the table:</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Code</th> <th>1001</th> <th>1002</th> <th>1003</th> </tr> </thead> <tbody> <tr> <td>Name</td> <td>S.Raman</td> <td>M.Sushil</td> <td>Mohanyes</td> </tr> <tr> <td>DOJ</td> <td>12-Jun-97</td> <td>12-Nov-97</td> <td>30-Jul-97</td> </tr> </tbody> </table>	Column name	Datatype	Ccode	Int	Name	Char(20)	DOJ	Date	Code	1001	1002	1003	Name	S.Raman	M.Sushil	Mohanyes	DOJ	12-Jun-97	12-Nov-97	30-Jul-97	01	
Column name	Datatype																						
Ccode	Int																						
Name	Char(20)																						
DOJ	Date																						
Code	1001	1002	1003																				
Name	S.Raman	M.Sushil	Mohanyes																				
DOJ	12-Jun-97	12-Nov-97	30-Jul-97																				





	ii) Order the records on the basis of seniority of employees. iii) Drop the table.	
8	Write a Program in ASP that has a form taking the user's name as input. Store this name in a permanent cookie & whenever the page is opened again, then value of the name field should be attached with the cookie's content.	01
9	Create a Session dictionary using object tag. In session-on start add keys for Time, UserAgent, RemoteIP& add appropriate values. Create a simple page to display the values.	01
10	Write a Program to delete all cookies of your web site that has created on the client's computer	01
	<b>Structured enquiry</b>	
11	Write an application that contains a list of following technologies: <ul style="list-style-type: none"> <li>• ASP.NET, ADO.NET, C#.</li> <li>• It also contains a textbox in which the user has to enter a name and a textarea in which the user has to enter his comments. When the Submit is clicked, the output should display the name entered in the textbox and the user-selection from the listbox. All the above should be displayed with the tracing for the page being enabled.</li> </ul>	02

17ECAP902

Mini Project-4

Course Code: 17ECAP902

Course Title: **Mini Project - 4**

L-T-P: **0-0-2**

Credits: **2**

Contact Hrs: **4**

ISA Marks: **100**

ESA Marks: **100**

Total Marks: **200**

Teaching Hrs: **48**

Exam Duration: **3 Hours**

**Theme: "Development of Applications using .NET/ Java Technology"**

**.NET Technology**

The Microsoft .NET framework has major advantages over previous programming languages and environments. Applications written in .NET may be in any of several different programming languages (language interoperability). .NET consists of a re-useable library of classes (small components that help developers create applications). It also consists of a development environment to help developers rapidly and graphically build applications. All operating system functions can be encapsulated within





.NET. The framework manages the execution of applications and Web services, and provides many functionalities including security enforcement and memory management. Because of these advantages, corporations and industry are beginning to embrace .NET. They will need graduates who know how to use it. Hence, a project done using this technology would give an insight of the powerful features of .NET and help the students to find a job in this field. Below is a list of some of the types of applications that can be created using the .NET platform.

- Customer relationship management
- Accounting applications
- Product/inventory applications
- Warehousing applications using hand-held devices
- Web sites
- Value chain/supply management
- Integration with partners through the Internet
- XML Web services
- PDA (hand-held) applications

#### **Objectives of using .NET Technology-**

Student doing a project in .NET technology should be able to:

7. Develop an application that is pure OOP, platform independent, language independent and interoperable.
8. Use the features of .NET to make the application scalable, maintainable, easily deployable, reliable and secure.
9. Work with databases using ADO.NET.
10. Develop background processes windows services.
11. Create animations using .NET's WPF.
12. Create and use Web Services through SOA.

#### **Java Technology**

Java is one of the fundamental programming languages that can be used in many applications as well as product developments. The simple reason for this is because Java can be put to use in various platforms due to its multi-platform nature. Java is one of the favorite choices for developers for many reasons like security, object oriented(reusability), cross platform computing, multithreaded capability, Rich API, Powerful development tools ,availability of various frameworks, Great collection of open source libraries, wonderful community support, Excellent documentation support. Support for various databases and many more.

Students can use the following tools in web and mobile applications as well as product developments:

- ☒ Struts, Spring, Hibernate and JPA
- ☒ JAXB and Apache Axis 2/Java
- ☒ JSP, Servlets, JDBC, EJB, JMS, JTA and JUnit
- ☒ Apache Tomcat, JBoss and GlassFish
- ☒ JavaScript, JSF, GWT and jQuery
- ☒ Eclipse, Netbeans and JBoss tools



☒ TestNG

☒ jBPM and Drools

☒ JCR

**Objectives:**

Help students to utilize and strengthen the knowledge of Java which they have learnt in previous semester.

**Methodology:**

Students are asked to make a team of 3-4 members and can choose the different categories of projects like desktop applications, web applications, mobile application and distributed application and work once it is approved by the coordinator.

**Evaluation:**

Students Assessment through ISA (100) + ESA (100%)

In Semester Assessment	Assessment	Marks
	Problem Definition, Literature Review	10
	Synopsis and SRS Deliverables	10
	Design (Module wise algorithmic design)	20
	Coding	10
	Integration and testing	10
	Report	20
	Presentation skills and Viva-voce	20
	<b>Total</b>	<b>100</b>
End Semester Assessment	Presentation	50
	Viva-voce	50
	<b>Total</b>	<b>100</b>

17ECAE901

Block Chain Technologies

Course Code:17ECAE901

Course Title: **Block Chain Technologies**

L-T-P: **3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks: **50**

ESA Marks: **50**

Total Marks: **100**

Teaching Hrs: **42+24**

Exam Duration:**3Hrs**

**No**

**Content**

**Hrs**

**Unit I**

**1 Introduction**

**5 hrs**

What blockchain is, What blockchain isn't, Blockchain definitions, How are blockchains different from databases? History of blockchain, Blockchain 2.0, The motivations behind blockchain, Characteristics of blockchain, Background of DLT, The



different types of blockchain, Overview of blocks, Influence of Moore's law on blockchain technology.

**2 A Bit of Cryptography.** 6 hrs

Cryptography in blockchain, Classical cryptography, Cryptographic primitives, Symmetric key cryptography, Asymmetric key cryptography, Elliptic-curve cryptography, Digital signatures, Cryptographic hashing.

**3 Cryptography in Blockchain** 6 hrs

Hashing in blockchain, Linking blocks in a blockchain, Linking blocks using an SHA256 hashing algorithm, Block structure, Blockchain functionality, Creating a blockchain, Byzantine failure problem in blockchain, Digital signatures in blockchain, Creating an identity, Signatures in transaction, Asset ownership in blockchain, Transferring an asset, Transmitting the transaction, Claiming the asset, Blockchain wallets.

**Unit - 2**

**4 Networking in Blockchain.** 6 hrs

Peer-to-peer (P2P) networking, Network discovery, Block synchronization, Building a simple blockchain in a P2P network, Validating a new block, Selecting the longest chain, Conflict resolution, Block exchange between peers, Initial block synchronization, Broadcasting scenarios, Application interfaces.

**5 Cryptocurrency.** 6 hrs

Bitcoin basics, Getting started with Bitcoin Core, Keys and addresses, Transactions, Mining and consensus, Blockchain, Blockchain networks, Bitcoin hard forks and altcoins, A simple cryptocurrency application: Transactions, Wallet, Transaction management.

**6 Diving into Blockchain - Proof of Existence.** 5 hrs

MultiChain blockchain platform, Setting up a blockchain environment, Getting started with MultiChain, Proof of Existence architecture, Building the Proof of Existence application, Executing and deploying the application.

**Unit - 3**

**7 Diving into Blockchain - Proof of Ownership.** 4 hrs

Digital assets and identity, Proof of ownership, Smart contracts, Choosing the smart contract platform, NEO blockchain: Building blocks of a NEO blockchain, NEO technology, NEO nodes, NEO network, NEO transactions, Ethereum blockchain: Ethereum nodes, Getting started, Creating a decentralized application.

**8 Blockchain Security.** 4 hrs

Transaction security model, Decentralized security model, Attacks on the blockchain, Threats of quantum computing.

Text Book:

1. Foundations of Blockchain, O'REILLY publications, 2019



References:

### Evaluation Scheme

#### In Semester Assessment (ISA)

Assessment	Marks
ISA- 1	20
ISA- 2	20
Assignment	10
<b>Total</b>	<b>50</b>

#### End Semester Assessment (ESA)

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2, 3,	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	4, 5, 6	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	7, 8	Any 1 question is to be answered

### Practices

1. Implementation of basic cryptographic algorithms such as AES, ECC, RSA, ECDSA, SHA256.
2. Implementation of cryptographic primitives such as hash functions and digital signatures.
3. Implementation of P2P blockchain application.
4. Implementation of Interface for the cryptocurrency application such as wallet application and explorer application.
5. Implement decentralized application development using MultiChain blockchain framework by considering real time use case.
6. Develop decentralized application using smart contract concept in NEO and Ethereum blockchain platforms by considering real time use case.
7. Simulation of double spend attack on the Bitcoin unconfirmed transaction.

17ECAE903

RESTful Web Services

Course Code: 17ECAE903

Course Title: **RESTful Web Services**

L-T-P: **3-0-1**

Credits: **4**

Contact Hrs: **5**

ISA Marks: **50**

ESA Marks: **50**

Total Marks: **100**



Teaching Hrs: **42+24**

Exam Duration:**3Hrs**

No	Content	Hrs
	<b>Unit I</b>	
<b>1</b>	<b>Chapter 1 : The Programmable Web and Its Inhabitants</b> Kinds of Things on the Programmable Web, HTTP: Documents in Envelopes, Method Information, Scoping Information, The Competing Architectures, RESTful, Resource-Oriented Architectures, RPC-Style Architectures, REST-RPC Hybrid Architectures, The Human Web Is on the Programmable Web, Technologies on the Programmable Web, HTTP, URI, XML-RPC, SOAP, WS-*, WSDL, WADL, Leftover Terminology.	<b>4 Hrs</b>
<b>2</b>	<b>Chapter 2 : Writing Web Service Clients</b> <b>Web Services Are Web Sites</b> , Wrappers, WADL, and ActiveResource, del.icio.us: The Sample Application, What the Sample Clients Do, Making the Request: HTTP Libraries, Optional Features, Ruby: rest-open-uri and net/http, Python: httplib2, Java: HttpClient, C#: System.Web.HTTPWebRequest, PHP: libcurl, JavaScript: XMLHttpRequest, The Command Line: curl, Other Languages.Processing the Response: XML Parsers: Ruby: REXML, I Guess, Python: ElementTree, Java: javax.xml, Xerces, or XMLPull, C#: System.Xml.XmlReader , PHP, JavaScript: responseXML, Other Languages, JSON Parsers: Handling Serialized Data , Clients Made Easy with WADL	<b>4 Hrs</b>
<b>3</b>	<b>Chapter 3 : What Makes RESTful Services Different?</b> Introducing the Simple Storage Service, Object-Oriented Design of S3 , A Few Words About Buckets, A Few Words About Objects, What If S3 Was a Standalone Library? Resources, HTTP Response Codes, An S3 Client, The Bucket List : The Bucket, The S3 Object, Request Signing and Access Control: Signing a URI, Setting Access Policy: Using the S3 Client Library, Clients Made Transparent with ActiveResource : Creating a Simple Service, An ActiveResource Client, A Python Client for the Simple Service, Parting Words.	<b>4 Hrs</b>
<b>4</b>	<b>Chapter 4 : The Resource-Oriented Architecture</b> Resource-Oriented What Now? What's a Resource? URIs: URIs Should Be Descriptive, The Relationship Between URIs and Resources : Addressability, Statelessness : Application State Versus Resource State, Representations: Deciding Between Representations, Links and Connectedness, The Uniform Interface: GET, PUT, and DELETE : HEAD and OPTIONS, POST: Creating subordinate resources, Appending to the resource state, Overloaded POST: The not-so-uniform interface, Safety and Idempotence, Safety: Idempotence ,Why safety and idempotence matter Why the Uniform Interface Matters, That's It!	<b>4 Hrs</b>
<b>5</b>	<b>Chapter 5 : Designing Read-Only Resource-Oriented Services</b> Resource Design, Turning Requirements Into Read-Only Resources, Figure Out the Data Set, General Lessons, Split the Data Set into Resources, General Lessons, Name the Resources, Encode Hierarchy into Path Variables, No Hierarchy? Use Commas or Semicolons, Map URIs, Scale, Algorithmic Resource? Use Query Variables, URI Recap, Design Your Representations:_The Representation Talks About the State of the Resource, The Representation Links to Other States, Representing the List of Planets,	<b>4 Hrs</b>



Representing Maps and Points on Maps, Representing the Map Tiles, Representing Planets and Other Places, Representing Lists of Search Results, Link the Resources to Each Other, The HTTP Response : What's Supposed to Happen? Conditional HTTP GET, What Might Go Wrong? Conclusion.

**Unit II**

**6 Chapter 6 : Designing Read/Write Resource-Oriented Services 4 Hrs**

**User Accounts as Resources : Why Should User Accounts Be Resources?**  
Authentication, Authorization, Privacy, and Trust, Turning Requirements into Read/Write Resources, Figure Out the Data Set, Split the Data Set into Resources, Name the Resources with URIs, Expose a Subset of the Uniform Interface, Design the Representation(s) Accepted from the Client, Design the Representation(s) to Be Served to the Client, Link This Resource to Existing Resources, What's Supposed to Happen? What Might Go Wrong?  
**Custom Places : Figure Out the Data Set, Split the Data Set into Resources, Name the Resources with URIs, Expose a Subset of the Uniform Interface ,Design the Representation(s) Accepted from the Client, Design the Representation(s) Served to the Client, Link This Resource to Existing Resources, What's Supposed to Happen? What Might Go Wrong?**  
**A Look Back at the Map Service**

**7 Chapter 7 : A Service Implementation : 4 Hrs**

A Social Bookmarking Web Service, Figuring Out the Data Set, Resource Design: REST in Rails, The User Controller, The Bookmarks Controller, The User Tags Controller, The Calendar Controller, The URI Controller, The Recent Bookmarks Controller, The Bundles Controller, The Leftovers, Remodeling the REST Way, Implementation: The routes.rb File. Design the Representation(s) Accepted from the Client, Design the Representation(s) Served to the Client, Connect Resources to Each Other, What's Supposed to Happen? What Might Go Wrong? Controller Code : What Rails Doesn't Do:Conditional GET: param[:id] for things that aren't IDs, The Application Controller, The Users Controller The Bookmarks Controller, The Tags Controller, The Lesser Controllers, The Calendar Controller : The RecentController, The UrisController, Model Code: The User Model The Bookmark Model, What Does the Client Need to Know? Natural-Language Service Description, Description Through Standardization ,Hypermedia Descriptions

**8 Chapter 8 : REST and ROA Best Practices 4 Hrs**

Resource-Oriented Basics, The Generic ROA Procedure, Addressability : Representations Should Be Addressable : State and Statelessness: Connectedness, The Uniform Interface : Safety and Idempotence, New Resources: PUT Versus POSTOverloading POST, This Stuff Matters : Why Addressability Matters, Why Statelessness Matters, Why the Uniform Interface Matters, Why Connectedness Matters A terrifying example. Resource Design : Relationships Between Resources, Asynchronous Operations, Batch Operations, Transactions: When In Doubt, Make It a Resource, URI Design, Outgoing Representations, Incoming Representations, Service Versioning, Permanent URIs Versus Readable URIs, Standard Features of HTTP : Authentication and Authorization: Basic authentication, Digest authentication, WSSE



username token : Compression, Conditional GET, Caching : Please cache Thank you for not caching, Default caching rules, Look-Before-You-Leap, Requests Partial GET : Faking PUT and DELETE, The Trouble with Cookies, Why Should a User Trust the HTTP Client?, Applications with a Web Interface, Applications with No Web Interface What Problem Does this Solve?

**9 Chapter 9 : The Building Blocks of Services 4 Hrs**

Representation Formats : XHTML, XHTML with Microformats, Atom, OpenSearch SVG, Form-Encoded Key-Value Pairs, JSON, RDF and RDFa, Framework-Specific Serialization Formats : Ad Hoc XHTML, Other XML Standards and Ad Hoc Vocabularies, Encoding Issues, XML and HTTP: Battle of the encodings, The character encoding of a JSON document

Prepackaged Control Flows: General Rules, Database-Backed Control Flow, GET, PUT, POST for creating a new resource, POST for appending to a resource, DELETE

The Atom Publishing Protocol: Collections, Members, Service document, Category documents, Binary documents as APP members, GData: Querying collections, Data extensions, POST Once Exactly,

Hypermedia Technologies : URI Templates, XHTML 4, XHTML 4 links, XHTML 4 forms, Shortcomings of XHTML 4, XHTML 5, WADL : Describing a del.icio.us resource, Describing an APP collection, Is WADL evil?

**10 Chapter 10 : The Resource-Oriented Architecture Versus Big Web Services 4 Hrs**

What Problems Are Big Web Services Trying to Solve? SOAP :The Resource-Oriented Alternative, WSDL: The Resource-Oriented Alternative, UDDI: The Resource-Oriented Alternative, Security: The Resource-Oriented Alternative, Reliable Messaging : The Resource-Oriented Alternative, Transactions: The Resource-Oriented Alternative, BPEL, ESB, and SOA, Conclusion.

**Unit – III**

**11 Chapter 11 : Ajax Applications as REST Clients 5 Hrs**

From AJAX to Ajax, The Ajax Architecture, A del.icio.us Example, The Advantages of Ajax, The Disadvantages of Ajax, REST Goes Better, Making the Request, Handling the Response, JSON, Don't Bogart the Benefits of REST, Cross-Browser Issues and Ajax Libraries : Prototype, Dojo, Subverting the Browser Security Model, Request Proxying, JavaScript on Demand: Dynamically writing the script tag, Library support.

**12 Chapter 12 : Frameworks for RESTful Services 5 Hrs**

Ruby on Rails : Routing, Resources, Controllers, and Views, Outgoing Representations, Incoming Representations, Web Applications as Web Services, The Rails/ROA Design Procedure. Restlet: Basic Concepts: Writing Restlet Clients, Writing Restlet Services: Resource and URI design, Request handling and representations, Compiling, running, and testing, Conclusion. Django: Create the Data Model, Define Resources and Give Them URIs, Implement Resources as Django Views, The bookmark list view, The bookmark detail view: Further directions, Conclusion





**Text Book:**

- 1 RESTful Web Services by Sam Ruby, Leonard Richardson, Publisher: O'Reilly Media, Inc. Release Date: May 2007 ISBN: 9780596529260

References:

1. Hands-On RESTful Python Web Services: Develop RESTful web services or APIs ... By Gaston C. Hillar

**Evaluation Scheme**

**In Semester Assessment (ISA)**

Assessment	Marks
ISA- 1	20
ISA- 2	20
Assignment	10
<b>Total</b>	<b>50</b>

**End Semester Assessment (ESA)**

UNIT	8 Questions to be set of 20 Marks Each	Chapter Nos.	Instructions
I	3 Questions to be set of 20 Marks Each	1, 2, 3, 4, 5	Any 2 questions are to be answered
II	3 Questions to be set of 20 Marks Each	6, 7, 8, 9,10	Any 2 questions are to be answered
III	2 Questions to be set of 20 Marks Each	11, 12	Any 1 question is to be answered

**RESTFull Web Services**

SI NO Topics

1. Working on XML-RPC and SOAP Protocol
2. Working on Web Service Client using httplib2 python library
3. Understanding of CURL command and its options
4. Implementation of XML and JSON Parsing using Python
5. Working on client application to store and retrieve the data using S3 Bucket
6. Implementation of RESTfull services for data request and response
7. Working on Authentication and Authorization for RESTfull services
8. Implementation of RESTfull services for data and serialization formats, Database connectivity
9. Integration of AJAX and REST Clients





**Program: MASTER OF COMPUTER APPLICATIONS**

Course Code: **17ECAP904**

Course Title: **Robotics Process Automation**

L-T-P: **0-0-2**

Credits: **2**

Contact Hrs: **Full Time**

ISA Marks: **100**

ESA Marks: **--**

Total Marks: **100**

Teaching Hrs: **Full Time**

Exam Duration: **3 Hours**

The students shall undergo certification on Robotics Process Automation (RPA) during the IV or V semester vacation by choosing Automation Anywhere or UiPath course or both. The evaluation for the course shall be done after successful completion of certification on any one or both during VI semest

er followed by internal assessment and submission of report.

18ECAE903

Web Mapping

To be approved in April 2021 BoS