Gujarat University

Bachelor of Computer Applications
(B.C.A.)
Syllabus
Semester- VI
(Effective from 2019-20)

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Course Title: Software Testing
Course Code: CC-307
Course Credit: 3
Session Per Week: 4
Total Teaching Hours: 40 Hours

AIM

To develop the skill about what is testing, types of Testing Methods, Levels of Testing and its Management
To make the students able to test the existing systems.

LEARNING OUTCOMES

On the completion of the course students will:
1. To understand the basic terminologies and types of testing
2. Understand different testing methods
3. Understand the testing process
4. Manage the tests, plan testing process and create reports.

DETAIL SYLLABUS

Unit-1   **10 hours**
INTRODUCTION
- Definition of Software Testing and its Role
- Terms:- Failure, Error, Fault, Defect, Bug
- Goals of Testing
- Principles of Testing
- Software Testing Life Cycle
- Verification and Validation :- V-testing Life cycle
- Static and Dynamic Testing

Unit-2   **10 hours**
TYPES OF TESTING
- Black Box Testing
- Overview: What is & When?
- Techniques
  - o Boundary Value Analysis
  - o Equivalence class testing
  - o Decision Table
- White Box Testing
- What is white box Testing
- Need of white box Testing
- Classification
- Structural : Coverage, Path
- Static : Inspection, Walkthrough , Technical Review

Unit-3   **10 hours**

LEVELS OF TESTING
- Unit Testing : Overview
- Integration Testing : Overview
- Techniques: Graph based   & Path based
- Functional Testing
- System Testing :Overview
- Categories: Reliability Security Performance Recovery
- Acceptance Testing : Overview, Types of Acceptance Testing

Unit-4   **10 hours**

TEST MANAGEMENT
Test Planning:
- Preparing a Test plan, Scope management, Decide Test Approach, Setting Up Criteria for testing, Indentifying responsibilities, Staffing, training needs, Resource requirements, Test deliverables, Testing Tasks

Test Management:
- Choice of standards, Test infrastructure management, Test people management, Integrating with product release
- Test Process: Base line a test plan, Test case specification, Update of traceability
- Test reporting: Recommending product release

TEXT BOOK/S:
UNIT 1,2,3 :-Software Testing: Principles and Practice by Srinivasan Desikan, Gopalaswamy Ramesh,Pearson
UNIT -4 :-Software Testing: Principles and Practice by Naresh Chauhan, Oxford

REFERENCE BOOKS:
Software Testing: Easy Learning Approach by Shubha Agarwal Kundlas"

WEB RESOURCES:
"http://www.softwaretestingsoftware.com
https://www.guru99.com › software-testing-introduction-importance

REQUIRED SOFTWARE/S

Course Title: Introduction to Data Mining and Data Warehousing
Course Code: CC-308
Course Credit: 3
Session Per Week: 4
Total Teaching Hours: 40 Hours

AIM

Learn data mining concepts understand association rules mining and to develop the abilities of critical analysis to data mining systems and applications.

LEARNING OUTCOMES

Understand data mining principles and techniques: Introduce DM as a cutting edge business intelligence method and acquaint the students with the DM techniques for building competitive advantage through proactive analysis, predictive modelling, and identifying new trends and behaviours.

Ability to perform the preprocessing of data and apply mining techniques on it.

DETAIL SYLLABUS

Unit-1   10 Hours

- What is Data Mining?
- What kind of Data can be Mined?
- What Kind of patterns can be mined?
- Which technologies can be used?
- Major Issues in Data Mining

Unit-2   10 Hours

Data Warehouse : Basic Concepts
- What is Data Warehouse
- Difference between operational database system and data warehouses
- Multitier Architecture

Data Warehouse Modeling: Data cube and OLAP
- Data Cube: Multidimensional Data Model
- Typical OLAP Operations

Data Warehouse Design and Usage
- A business Analysis Framework for Data Warehouse Design
- Data warehouse Design Process
- Data Warehouse USAGE FOR Information Processing
- From OLAP to Multidimensional data Mining

Unit-3   10 Hours

➢ Data Processing and Over View

- ➢ Data Cleaning
- ➢ Overview of Data Reduction Strategies
  - • Histogram
  - • Sampling
  - • Data Cube Aggregation

Association Rule Mining
  - • Basic Concepts: Association

Apriori Algorithm

Unit-4   10 Hours

- • What is Classification
- • General Approach to classification
- • Decision Tree Induction
- • What is cluster Analysis
- • Overview of basic clustering methods
- • K Means Centroid based technique
- • Data Mining Applications

TEXT BOOKS:
Data Mining, Concept and techniques (3rd Edition) by jiawei Han and Micheline Kamber.

REFERENCE BOOKS:
- • Data Mining by Reema Thareja.
- • M. Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education.
- • Data Warehousing by Reema Thareja, 2014, Oxford Publication.
- • M. Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education, 2006.
- • Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Person Education, 2007.
- • Data Mining: Practical Machine Learning Tools and Techniques by Ian H. Witten, Eibe Frank, Mark A. Hall, Elsevier 2014.
- • Data Mining and Data Warehousing: Principles and Practical Techniques by Parteek Bhatia, Cambridge Publication, 2019.

WEB RESOURCES:
https://www.tutorialspoint.com/data_mining/index.htm
https://www.tutorialspoint.com/dwh/index.htm
https://www.geeksforgeeks.org/data-mining/
https://docs.oracle.com/cd/B28359_01/datamine.111/b28129/process.htm#DMCON0
02
https://www.educba.com/data-mining-concepts-and-techniques/

Course Title:	Introduction to Artificial Intelligence and Machine Learning
Course Code:	CC-309
Course Credit:	3
Session Per Week:	4
Total Teaching Hours:	40 Hours

AIM

This course introduces students the fundamentals of artificial intelligence and machine learning and how different business and organizations are trying to use it some way or other to build smart systems, quick decision making etc.

LEARNING OUTCOMES

On the completion of the course students will:
1. Understand the role of basic knowledge representation in AI.
2. Learn how to use AI for problem solving.
3. Deduce the use of NLP applications.
4. Understand the concept machine learning and its types.

DETAIL SYLLABUS

Unit-1   **10 Hours**

Fundamentals of Artificial intelligence and Intelligent Agent
What is AI?
- Acting humanly: The Turing Test approach,
- Thinking humanly: The cognitive modeling approach,
- Thinking rationally: The "laws of thought" approach,
- Acting rationally: The rational agent approach

State of Art (Applications of AI)
Agents and Environments
The Concept of Rationality
The Nature of Environment
The Structure of Agents.
Case Study: Create a new health care market with AI

Unit-2   **10 Hours**

Problem Solving by searching
Problem-Solving Agents
- Well defined problem and solutions
- Formulating problems

Example Problems
- Toy problems

Searching for Solution
Uninformed Search Strategies

- Concept of BFS
- Concept of DFS
- Depth-limited search
- Iterative deepening DFS
- Bidirectional search

Informed (Heuristic) Search Strategies
- Concept of Greedy BFS
- A* search: Minimizing the total estimated solution cost

Case Study: Applications of AI in transportation.

Unit-3   **10 Hours**

Natural language processing
Language Models
- N-gram character models
- N-gram word models

Text classification
- Classification by data compression

Information retrieval
- The page rank algorithm
- The HITS algorithm

Information extraction
- Finite state automata for information extraction
- Probabilistic model for information extraction.

Examples: Applications of Natural Language Processing.
Case Study: Automated Voice Assistants, Chat bots.

Unit-4   **10 Hours**

Machine Learning
Machine Learning in the bigger picture
Areas of machine learning and grades for supervision
Supervised Learning strategies - regression versus classification
Unsupervised problem solving-clustering
Types of Machine Learning:
- Supervised, Unsupervised
- Semi-Supervised Learning
- Reinforcement Learning

How Supervised Learning works.
Why the model works on new data.
Case Study: Recommendation Based Systems, At Microsoft, AI is a Big, Big Deal.

TEXT BOOKS:
1) Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig, Third Edition
2) Machine Learning for Developers: Claudio Delrieux
3) The Hundred-Page Machine Learning Book : Andriy Burkov

REFERENCE BOOKS:
1) Artificial Intelligence, 2nd Edition, Rich and Knight
2) Machine Learning, Tom M Mitchell
3) Artificial Intelligence: A New Synthesis, Nils J. Nilsson

4) Artificial Intelligence in the real world, The Economist Intelligence Briefing Paper, Wipro [Case Study]
5) Getting Smarter by the day: How AI is elevating the performance of global companies. [Case Study]

WEB RESOURCES:
1)https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_quick_guide.htm
2)https://www.geeksforgeeks.org/introduction-to-natural-language-processing/
3)https://www.geeksforgeeks.org/introduction-machine-learning/
4)https://www.geeksforgeeks.org/getting-started-machine-learning/
5)https://www.lanner-america.com/blog/examples-artificial-intelligence-applications-transportation/
6)https://medium.com/@datamonsters/artificial-neural-networks-in-natural-language-processing-bcf62aa9151a
7)https://www.tutorialspoint.com/machine_learning/index.htm

Course Title:	Web Applications Development – II Practical
Course Code:	CC-310
Course Credit:	3
Session Per Week:	3
Total Teaching Hours:	40 Hours

AIM

This course will make the students familiar with a very convenient, dynamic, flexible server-side language: PHP for web application development.
The students will learn the basics and also application of PHP functions for database operation using MYSQL.Students will also learn about implementing AJAX in PHP for increasing speed and performance of web applications.

LEARNING OUTCOMES

On the completion of the course students will:
1.To setup and configure XAMPP
2.To develop server side programs using PHP in dynamic web development.
3.To debug a PHP/AJAX web application.
4.To use AJAX for efficient and fast communication between client and server.

DETAIL SYLLABUS

Unit-1   **10 Hours**

PHP Basics
1.Write a program in PHP to display "Learning PHP" in bold format.
2.Write a program in PHP to demonstrate the use of comments, echo and print.
3.Create a program in PHP to demonstrate the use of If … Else and switch statements.
4.Create an array named $sub, assign five elements to it and display the elements assigned using for loop and foreach statement.
5.Create an array named $student, that sores 5 element bounded to a different keys and access the same using the key element.
6.Write a program in PHP to demonstrate the use of multidimensional arrays.
7.Create two functions in PHP, parameterized and non parameterized for implementing string concatenation operation.
8.Write a PHP program to display information of PHP in the browser.
9.Write a program in PHP to sort the array of given 5 numbers in ascending and descending order.
10.Write a program to count the total number of times a specific value appears in an array.

Unit-2   **10 Hours**

PHP and MYSQL Programming

1.Create a form containing two input fields (Name, Email_ID) and a submit button. When the user clicks on submit button, the form data should be sent for processing to PHP file ,which should display the welcome message with the email_id on the PHP page. Form data should be sent by HTTP GET/POST method.

2.Write a PHP script for that creates a database named "DB-1"in MySQL.

3.Write a PHP script for creating a product table in the specified database with fields Pro_id, Pro_name, Pro_price, QOH. Also display an acknowledgement for the same.

4.Create a form contaning four input fields(Pro_id, Pro_name, Pro_price, QOH) and Submit button. When the user clicks on the submit button an PHP script should be executed which inserts the record in the product table.

5.Create a form contaning one input field(Pro_id) and a search button. When the user clicks on the Search button a PHP script should get executed and should display the details of the product for the Pro_id specified.

6. Create a form contaning two input fields (Pro_id, QOH) and Update button. When the user clicks on the Update button the quantity of the Pro_id specified should get updated using a PHP script.

7.Create a form contaning one input field(Pro_id) and a Delete button. When the user clicks on the Delete button a PHP script should get executed and should delete the record of the product for the Pro_id specified.

Unit-3   **10 Hours**

AJAX and Validation

1.Create a form containing one input field (Name). When the user enters his/her name and as any key is released , the form should display a welcome message for the user. Implement using AJAX.

2.Repeat the above question to demonstrate the use of keydown and keypress events.

3.Write a program for converting a string into uppercase using AJAX.

4.Create a form contaning a combobox with some product names as items. Whenever a user selects a particular product from the combox, it shuold be sent to the server asynchronously (i.e. without pressing submit button). Implement using AJAX.

5.Write a program to demostrate the example of sending items selected from radio and checkbox to server asynchronously.

6.Write a program to validate a blank field and also validate the length of the data entered(i.e. minimum lenght of 5).

7.Write a programto validate and Email ID using regular expression and by using DOM.

8.Write a program that checks a particular stuId already exits in the student(stuId,stu_name,mob,country) table or not. If stuId exists then display a message "User Already Exit. Try another stuId". If it does not exits then add the data in the student table.Implement using AJAX.

Unit-4   **10 Hours**

AJAX,PHP ,MSQL all combined And Project

1.Create a Shopping Cart Project in PHP Script.

2.Create a Shopping Cart Project in AJAX.

TEXT BOOK:

Developing Web Applications in PHP and AJAX
Publisher: McGraw Hill
By B M Harwani

REFERENCE BOOKS:

1. Teach yourself PHP, MySQL and Apache
Publisher: Pearson
By Julie C. Meloni
2. PHP Ajax Cookbook
Publisher: PACKT Publishing
R. Rajesh Jeba Anbiah
Roshan Bhattarai
Milan Sedliak"

WEB RESOURCES:
1. https://www.w3schools.com/php/
2. http://www.learn-php.org/
3. https://www.tutorialspoint.com/php/"

REQUIRED SOFTWARES
1. MySQL Database
2. MySQL Workbench
3. XAMPP or WAMP or LAMP
4. Notepad++

Course Title:	Shell Programming Practical
Course Code:	CC-311
Course Credit:	3
Session Per Week:	3
Total Teaching Hours:	40 Hours

AIM

The students using the concepts of filters, special commands in Linux operating system will be able to write efficient shell scripts. It also gives information about process management and communication commands.

LEARNING OUTCOMES

The student would be able

- To get knowledge about managing files in Linux system.
- To understand the use of common Linux editors to edit files and manage the contents of the file.
- To learn commands of Linux for manipulating and filtering the contents of the file.
- To develop the skills for writing shell scripts using files and filters.
- To obtain knowledge about compressing files and communication commands.

DETAIL SYLLABUS

Unit-1   **10 Hours**

General –Purpose Utilities and Files and directories
- General Purpose Utilities

Cal, date, echo, bc, script, who, uname, tty, man, info, passwd, logout, wc
- Linux Files andDirectories

Current Working Directory-pwd, Listing Files and Directories-ls, Matching Filenames with Patterns (wildcard characters), Simple Simple ways to create a file- touch,cat,, echo, Showing the contents of a file-cat, more, less, head, tail

Unit-2   **10 Hours**

Additional File Management Commands
- Additional File ManagementCommands

Creating Directories-mkdir, Removing Empty Directories-rmdir, Copying Files and Directories-cp, Removing Files and Nonempty Directories-rm, Renaming Files and Directories-mv, Comparing Two Files-cmp, What is Common-comm, Converting One File to Other-diff, Piping and Redirection andtee, File and Directory Permission andPrivileges chmod, LocatingFiles-find
- EditingFiles

Creating and Editing files using vi, picoand, emacseditors.
- Basics of Shell Scripting Programming

Creating Shell Scripts using various commands of Linux exceptFilters.; Interactive shell script using read andecho; DecisionStatements: if then fi, if then elsefi, if then elif elsefi,

caseesac; Testcommand; LogicalOperators; Loopingstatements: forloop, while loop, untilloop; Break, continue command; Arithmetic in Shell script usingexpr; Creating Shell Scripts to perform mathematical calculations

Unit-3   10 Hours
Simple Filters, filters using regular expression, advanced filters
- SimpleFilters: Paginating files –pr, Splitting a file vertically–cut, Pasting files-paste, Ordering a file-sort, Locate repeated and non repeatedlines-uniq, Translating characters–tr
- Filters using regular expression: Searching for pattern-grep, stream editior –sed
- Advanced filters: Simple awkfiltering, Comparisonoperators, Variables, Built invariables, Controlflow, Looping

Unit-4   10 Hours
Compressing , decompressing and achieving files & Customizing environment variables , communication commands
- Compressing , decompressing and achievingfiles: Gzip,gunzip, Tar, Zip and unzip
- Environment variables: Environment variables, Alias, Inline command editing, Miscellaneous features, Initialization script.
- Communication commands: Finger, Talk, Mesg, Mailx, Pine, Write, Wall

NOTE:
The students are expected to write shell scripts unit wise as given below.
The list in each unit is indicative only and may or may not be asked in the examination.

List of shell scripts file based on
1   Check the output of the following commands:date, ls, who, cal, ps, wc, cat, uname, pwd, mkdir, rmdir, cd, cp, rm, mv, diff, chmod, grep, sed, head, tail,cut, paste, sort, find, man
2   Write a script to find the complete path for any file.
3   Write a shell script to execute following commands
- Sort file abc.txt and save this sorted file inxyz.txt
- Give an example of : To execute commands together without affecting result of eachother.
- How to print "thisis
        a three –line
                1.   Textmessage"
- Which command display version of theUNIX?
- How would you get online help of catcommand?
4   Write a shell script to execute following commands
- How would u display the hiddenfiles?
- How delete directory withfiles?
- How would user can do interactivecopying?
- How would user can do interactive deletion offiles?
- Explain two functionality of "mv" command withexample?
5   Write a shell script to execute following commands
- Create a file called text and store name,age and address init.
- Display the contents of the file text on thescreen.
- Delete the directories mydir and newdir at oneshot.
- Sort a numericfile?

- Change the permissions for the file newtext to666.

6   Write shell script that accept filename and displays last modification time if file exists, otherwise display appropriate message.

7   Write a shell script to display the login names that begin with 's'.

8   Write a shell script to remove the zero sized file from the current directory

9   Write a shell script to display the name of all the executable file from the current directory.

10   Write a shell script that will display welcome message according to time

11   Write a shell script to find number of ordinary files and directory files.

12   Write a shell script that takes a filename from the command line and checks whether the file is an ordinary file or not.
- If it is an ordinary file then it should display the contents of thefile.
- If it is not an ordinary file then script should display the message: " File does not exist or is not ordinary, cannot display."

13   Write a shell script that takes a filename from the user and checks whether it is a directory file or not.
- If it is a directory, then the script should display the contents of the directory.
- If it is not a directory file then script should display the message: "File is not a directory file"

14   Write a shell script that takes a filename as an argument and checks if the file exists and is executable.
- If the file is executable then the shell script should display the message: "Fileexists"
- If the file does not exists and is not executable then the script should display the message: "File does not exist or is notexecutable."

15   Write a shell script that displays all subdirectories in current working directory.

16   Write a shell script that calculates the number of ordinary and directory files in your current working directory.

17   Write a shell script that accepts 2 filenames and checks if both exists; if both exist then append the content of the second file into the first file.

18   Write a shell script that takes the name of two files as arguments and performs the following:

i. Displays the message :

"Displaying the contents of file :(first argument)"

and displays the contents page wise.

ii.   Copies the contents of the first argument to second argument.

iii.   Finally displays the message: "File copied successfully."

19   Write a shell script to display the following menu and acts accordingly:

i.   Calendar of the current month and year.

ii.   Display "Good Morning/Good Afternoon/Good Evening" according tothe current login time.

iii.   User name, Users home directory.

iv.   Terminal name, Terminal type.

v.   Machine name.

vi.   No. of users who are currently logged in; List of users who are currently logged in.

20   Write a shell script that displays the following menu and acts accordingly

1.   Concatenates twostrings

2.   Renames afile

3.   Deletes afile.

4.   Copy the file to specific location

21	Write a shell script to change the suffix of all your *.txt files to .dat.
22	Write a shell script to accept a directory-name and display its contents. If input is not given then HOME directory's contents should be listed. (Make use of command line argument)
23	Write a shell script to get all files of home directory and rename them if their names start with c.

     Newname = oldname111
24	Write a shell script that takes two filename as arguments. It should check whether the contents of two files are same or not, if they are same then second file should be deleted.
25	Write a shell script that accepts two directory names from the command line and copies all the files of one directory to another. The script should do the following
▪	If the source directory does not exist, flash a error message
▪	If destination directory does not exist create it
▪	Once both exist copy all the files from source directory to destination directory.
26	Write a shell script that displays the following menu
▪	List homedirectory
▪	Date
▪	Print workingdirectory
▪	Users loggedin
Read the proper choice. Execute corresponding command. Check for invalid choice.
27	Write a shell script that displays all hidden files in current directory.
28	Write a shell script that Combine two files in the third file horizontally and vertically.
29	Write a shell script to delete all the spaces from a given file.
30	Write a shell script to find a given date fall on a weekday or a weekend.
31	Write a shell script to search for a given word in all the files given as the arguments on the command line.
32	Write a shell script that display last modified file in the current directory.
33	Write a script to display the permissions of the particular file.
34	Write a shell script to display the calendar in the following manner:

    i.	Display the calendar of months m1 and m2 by 'CAL m1, m2' commandfile.

    ii.	Display the calendar of the months from m1 to m2 by 'CAL m1-m2' commandfile.
35	Write a shell script to display the following menu for a particular file :

    i.	Display all the words of a file in ascendingorder.

    ii.	Display a file in descendingorder.

    iii.	Toggle all the characters in thefile.

    iv.	Display type of the file.
36	Write a shell script to check whether the named user is currently logged in or not.
37	Write a shell script to display the following menu for a particular file:

    i.Display all the words of a file in ascending order.

    ii.Display a file in descending order.

    iii.Display a file in reerse order.

    iv.Toggle all the characters in the file

    v.Display type of the file.
38	Write a shell script to find total no. Of users and finds out how many of them are currently logged in.
39	Write a shell script that displays the directory information in the following format-
Filename   Size Date Protection Owner

40   Write a shell script to display five largest files from the current directory
41   Write a shell script that toggles contents of the file
42   Write a shell script that report whether your friend has currently logged in or not. If he has logged in then the shell script should send a message to his terminal suggesting a dinner tonight. If you do have write permission to his terminal or if he hasn't logged in then such a message should be mailed to him about your dinner proposal.
43   Write a shell script for the performing the write and mail.
44   Write a shell script to accept any character using command line and list all the files starting with that character in the current directory.
45   Create a file called student containing roll-no, name and marks.
    a.   Display the contents of the file sorted by marks in descendingorder
    b.   Display the names of students in alphabetical order ignoring thecase.
    c.   Display students according to their rollnos.
    d.   Sort file according to the second field and save it to file'names'.
    e.   Display the list of students who scored between 70 and80.

Note: Shell Script based on Files and filters should only to be asked in exam

TEXTBOOKS:
1.   Beginning with Ubuntu Linux (First Edition 2007) Publisher : Apress Publications By Keir Thomas
2.   Unix : Concepts and Applications (Fourth Edition) Publisher: Tata McGrawHill By Sumitabha Das

REFERENCE BOOKS:
1.   Unix Shell Programming Publisher : BPB Publications By Yashvant PKanetkar
2.   The Official Ubuntu Book Publisher : Pearson Publications By Benjamin MakoHill
3.   Linux Command Line and Shell Scripting Bible- Publisher : Wiley IndianEdition. By Richard Blum
4.   Introduction to Unix/Linux Publisher: CengageLearning By ChristopherDiaz
5.   Introduction to UNIX and Shell Programming Publisher: PearsonEducation By M.G. Venkateshmurthy

Course Title:	Software Development Project – II
Course Code:	CC-312
Course Credit:	5
Session Per Week:	3
Total Teaching Hours:	40 Hours

AIM

This course provides an opportunity for students to apply the knowledge and skills acquired in the core courses to larger and more complex problems and to gain experience in working in teams.

LEARNING OUTCOMES

Students would have taken the project in semester V as per the guidelines of SDP Part-I and required to continue to work in developed of software in the VIth semester. This course is designed to provide the student experience in working with a client organization from the initial request through a final design and development of prototype software.

The student would be able to..

• Students will be exposed to software development process by choosing a typical business/scientific/administrative/system application.

• Define project scope, assess feasibility, and establish a project schedule.

• Get some experience in working with a client organization.

• Gain experience in working in a group for successfully developing the deliverables.

Mode of study: Half / One day off to work on the project in a week. (Atleast three hours must be allotted in weekly timetable for discussion/preparation of deliverables)

Course Contents:

1. Developing System Design
2. Writing code for the project
3. Doing testing of the code

Deliverables by the students:

- At the end of the semester, the student should be able to successfully develop the project and prepare the documentation (hard copy) as well as presentation of the project details.
- Live Demo of the Project must be shown at the time of presentation.
- Documentation:
  - A single hard bound documentation of SDP Part-II should also consist of the documentation prepared in SDP Part-I.
  - Although the students might have submitted the documentation of SDP Part-I, it should not be considered for evaluation.
  - A log-sheet of reporting to college faculty must be maintain.
- A hard copy of the documentation should consist of the additional following details:
  • Cover Page

- Company Certificate
- College Certificate
- Acknowledgement
- Index (with page nos.)
- Screen layouts
- Report layouts
- Sample coding (optional)
- Future Enhancements (optional)
- Conclusion
- Bibliography
- Log-sheet of reporting

Presentation:

• Presentations can be prepared through slides using Open Source / Power Point / Flash or any other multimedia tool, covering the work shown in the documentation.

• Presentation is must, but if students are showing the demo of the project, than faculty might not go through the presentation.

• During viva exams, students will be expected to satisfactorily answer the questions pertaining to the tools used, the process, the reports /forms created and the results achieved.

• Coding can be checked by external faculty, for the genuineness of the work.

• Checking of payment part is not compulsory

Course Title: Website Frameworks (Joomla, Ruby on Rails)
Course Code: SEC-302
Course Credit: 3
Session Per Week: 3
Total Teaching Hours: 40 Hours

AIM

This course enables the students to build web sites and powerful online applications using Joomla. It provides students with the opportunity to set up a Joomla community web site in the real world. Ruby on Rails (RoR) course provides the knowledge necessary to design and develop dynamic web pages using Ruby. This course introduces briefly the most important features of Ruby and some of the essentials of Rails.

LEARNING OUTCOMES

The student would be able
1) To create different types of online applications.
2) To create online magazines, newspapers, and publications.
3) To configure Joomla templates and populate the site with content and extensions.
4) To learn the basics of the Ruby language.
5) To understand fundamentals of Rails.

DETAIL SYLLABUS

Unit-1   10 Hours

Introductiopn to Joomla, sections, articles, categories in Joomla
Introductiopn to Joomla, sections, articles, categories in Joomla 10 Hours
Understanding Joomla!
- What is Joomla?
- Comparing static websites and content management system
- Choosing the right solution

Planning your website
- Determining the goal of an organization or project
- How will the website help to achieve the goal?
- Who will visit the website?
- What do the website visitors want? Identifying and organizing the website's information
- Identifying important functionality

A tour of the Joomla! Administrator interface
- Logging in
- Joomla!'s Menus: Site menu, Menus, Content, Components, Extensions, Tools, Help
- Common Interface buttons: New, Edit
- Publish and Unpublish

Defining section and category structure
- Making sections and categories useful
- Assigning sections and categories to your site map

Creating, editing and deleting sections
- Creating sections
- Editing sections
- Deleting sections

Creating, editing and deleting categories
- Creating categories
- Editing categories
- Category parameters
- Deleting categories

Creating, editing and deleting articles
- Creating articles
- Editing articles
- Deleting and restoring articles: Filtering articles

Adding articles to the home page
- Toggling the front page state of an article
- Working the front page manager
- Into text vs. full article text

Using advanced article options
- Adjusting TinyMCE settings
- Paste from world
- Creating links to other pages on the website
- Creating a link to another website
- Setting a start and finish publishing date
- Setting a different author name
- Accessing the article manager options

Including media in articles
- Joomla!'s Media manager
- Inserting images into articles
- Including video from youtube in your article

Unit-2   **10 Hours**

Joomla Menus, Templates and Modules Linking articles to the menu
- Linking an individual article to the menu
- Creating a category blog
- Creating article lists from a category

Using advanced menu options: articles
- Section layout and category list layout
  - o Parameters (Basic)
  - o Parameters (Advanced)
- Sections and category blog
  - o Parameters (Basic)
  - o Parameters (Advanced)
- Create article
- Archived articles

Using advanced menu options: creating new menus
- Creating new menu
- Moving menu items
- Displaying the menu module

Using advanced menu options: wrappers and external links
- Wrappers
- External links

Choosing and installing templates
- Joomla!'s default template
  - o Template parameters
  - o Assigning a template
- Which templates are better: free or commercial?
- Downloading and installing templates from other sites

Configuring Latest News and Newsflash
- Creating and configuring the latest news module
- Creating and configuring the newsflash module

Configuring Random Images
- Image consideration
- Configuring your photos
- Creating and editing the random image module
- Reordering Modules

Configuring search
- Creating and configuring the search module
- Specific Search components settings

Configuring Contacts
- Creating the contact category
- Creating the contact
- Menus: Displaying a single contact
- Menus: Displaying contacts within a category

Configuring Web Links
- Creating categories
- Creating links
- Menus: Displaying links

Unit-3   **10 Hours**

Extending Joomla! and Introduction to Ruby Adding extensions to Joomla!
- Introducing the Joomla! Extension directory
- Choosing a good extension
- Paid vs. Free: which is better?

Changing the editor in Joomla! To JCE
- Downloading JCE
- Installing JCE
- Assigning JCE as the default editor globally
- Assigning JCE as the Editor for specific users
- Using JCE
  - o Creating and editing links to site articles
  - o Uploading documents and creating links to them
- JCE configuration

Installing and configuring simple image gallery
- Downloading simple image gallery
- Installing simple image gallery
- Configuring simple image gallery
- uploading images
- displaying simple image gallery in an article

Creating and editing users

- Creating a user
- Understanding groups
- Editing and deleting users
- The importance of good passwords

Introduction to Ruby
- Ruby Basics
- Hello, Matz
- Interactive Ruby

A quick tour of Ruby
- Ruby is object-oriented
- Ruby's reserved words
- Comments and variables
- Strings
- Numbers and operators
- Conditional statements
- Arrays and hashes
- Methods and blocks
- symbols

Conditional Love
- The if statement
- The case statement
- The while loop
- The loop method
- The for loop
- Execution before or after a program

Unit-4   **10 Hours**

Strings, math, arrays and guide to ruby on rails

Strings
- Creating, Concatenating, Accessing, comparing, manipulating strings
- Case conversion and managing white spaces
- Incrementing and converting strings
- Regular expressions

Math
- Converting numbers
- Basic math operations

Arrays
- Creating arrays
- Accessing elements
- Concatenation
- Set operations
- Unique elements
- Comparing arrays
- Changing elements
- Deleting elements
- Arrays and blocks
- Sorting things and about face

A short guide to ruby on rails
- Where did rails come from?
- Why rails?
- Learning rails

- A brief tutorial

Note: It is desirable to teach Joomla and Ruby on Rails preferably in laboratory or through extensive demonstrations in classrooms.

TEXTBOOKS:
1. Joomla! 24-Hour Trainer
Publisher : WILEY- INDIA
By Jen Lramer
2. Learning Ruby
Publisher : O'REILLY
By Michael Fitzgerald

Course Title: Cloud Computing
Course Code: SEC-302 (B)
Course Credit: 3
Session Per Week: 3
Total Teaching Hours: 40 Hours

AIM

To uncover the core concepts of cloud computing to the students and at the same time providing ample foundations to enable further study, research and implementation of cloud computing services.

LEARNING OUTCOMES

On the completion of the course students will:
1. Visualize the various cloud computing environments.
2. Understand the core concepts of parallel, distributed computing and its architecture.
3. Learn and implement virtualization environments.
4. Articulate the insights of cloud computing architecture and its types.

DETAIL SYLLABUS

Unit-1   **10 Hours**

Introduction
Cloud Computing at a glance
- The vision of cloud computing
- Defining a cloud
- A closer look
- The cloud computing reference model
- Characteristics and benefits
- Challenges ahead

Historical Developments
- Distributed systems
- Virtualization
- Web 2.0

Build Cloud Computing Environments
- Computing platforms and technologies
- Amazon Web Services (AWS)
- Google AppEngine
- Microsoft Azure
- Hadoop

Unit-2   **10 Hours**

Principles of Parallel and Distributed Computing
Eras of computing
Parallel vs. distributed computing
Elements of parallel computing

- What is parallel processing?
- Hardware architectures for parallel processing
- Approaches to parallel programming

Elements of distributed computing
- General concepts and definitions
- Components of a distributed system
- Architectural styles for distributed computing
- System architectural styles
- Models for interprocess communication

Technologies for distributed computing
- Service-oriented computing

Unit-3   **10 Hours**

Virtualization
Introduction
Characteristics of virtualized environments
Taxonomy of virtualization techniques
- Execution virtualization
- Machine reference model
- Other types of virtualization

Virtualization and cloud computing
Pros and cons of virtualization
Technology examples
- VMware: full virtualization
- Virtualization Solution
- End-user (desktop) virtualization

Unit-4   **10 Hours**

Cloud Computing Architecture
Introduction
The cloud reference model
- Architecture
- Infrastructure- and hardware-as-a-service
- Platform-as-a-service
- Software-as-a-service

Types of clouds
- Public clouds
- Private clouds
- Hybrid clouds
- Community clouds

Economics of the cloud

TEXTBOOK:
1) Mastering Cloud Computing : Foundations and Applications Programming
   By Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi
   Publication: McGraw Hill Education

REFERENCE BOOK:

1) Essentials of Cloud Computing
   By K. Chandrasekaran
   Publication: CRC press, 2015

WEB RESOURCES:
Supplemental materials for instructors or students can be downloaded from else were:
1) http://store.elsevier.com/product.jsp?isbn=9780124114548
2) https://www.tutorialspoint.com/cloud_computing/index.htm
3) https://www.geeksforgeeks.org/cloud-computing/
4) https://www.w3schools.in/cloud-computing/cloud-computing/

Course Title:	Advance Java
Course Code:	SEC-302 (C)
Course Credit:	3
Session Per Week:	3
Total Teaching Hours:	40 Hours

AIM

To provide knowledge of advance concepts in Java programming like File IO, Swing and GUI Components, layout management in GUI, event handling, socket programming and database connectivity.

LEARNING OUTCOMES

On the completion of the course students will:

1. Understand the IO stream and learn about swing components.
2. Understand the Layout Management in GUI.
3. To design frames using swing componenets and evenet handling and layouts
4. To understand about netwroking concepts.
5. To understand the fundamental concept of database connectivity.

DETAIL SYLLABUS

Unit-1   **10 Hours**

Input and Output Classes
- IO Stream
- File class
- Byte Stream
  - Input Stream
  - Output Stream
- Disk File Handling
  - FileInput Stream
  - FileOutput Stream
- Filtered Byte Stream
  - DataInput Stream
  - DataOutput Stream
- ObjectOutputStream
- ObjectInput Stream
- Random Access File
- Character Stream
  - Reader
  - Writer

Unit-2   **10 Hours**

Swing and GUI Components
- The Origin of Swing
- Creating windows in Swing

- JButton
  - Creating JButtons
  - Creating JButtons on JFrame
- JLabel
  - Creating JLabel
  - Creating JLabel on JFrame
- JCheckBox
  - Creating JCheckBox
  - Creating JCheckBox on JFrame
  - Creating JCheckBox on JPanel
  - Using JCheckBox
- JRadioButton
  - Creating JRadioButton
  - Creating JRadioButton on JFrame
  - Using JRadioButton

Layout Managers
- BorderLayout
- FlowLayout
- GridLayout
- CardLayout

Unit-3   **10 Hours**
Event Handling
Delegation Event Model
Events
- ActionEvent class
- ItemEvent Class
- KeyEvent class
- TextEvent Class
Event Listeners
Registering Listener with source
Networking
o Overview of java.net package
o InetAddress
o Socket Programming (ServerSocket and Client Socket)
o Datagram (DatagramPacket and DatagramSocket)
o URL (URL class)

Unit-4   **10 Hours**
JDBC
Overview of JDBC and ODBC
- Types of Drivers
- Using a JDBC
- DriverManager- Creating Connection
- Connection Interfacer- Creating Statement
- Statement Interface -Executing Statements (insert, update , delete, select to/from table)
Note: Database should be any version of MS-Access

TEXTBOOK/S:
Programming in Java 2

Jaico publishing house
By Dr. K. Somasundaram

REFERENCE BOOKS:
1. Programming in Java
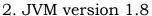   Oxford Publication
   By Sachin Malhotra and Saurabh Choudhary
2. The Complete Reference Java2
   TMH Publication
    By Herbert Schildt

WEB RESOURCES:
1. docs.oracle.com/javaee/6/tutorial/doc/girgm.html
2. docs.oracle.com/javaee/6/tutorial/doc/bnagi.htm
3. www.javatpoint.com
4. www.tutorialspoint.com

REQUIRED SOFTWARE/S
1. Any editor of Windows or Linux/UNIX.
2. JVM version 1.8

Course Title:	Enterprise Resource Planning
Course Code:	FC-302 (A)
Course Credit:	2
Session Per Week:	3
Total Teaching Hours:	40 Hours

AIM

The course would make students aware about ERP theory and practice. This course provides the students with the knowledge of evolution of ERP systems, business process reengineering, ERP technologies, process mapping, ERP life cycle and ERP auditing and risk issues.

LEARNING OUTCOMES

The student would be able
1) To comprehend the technical aspects of ERP systems.
2) To learn concepts of reengineering and how they relate to ERP system implementations.
3) To understand the success and failure factors of ERP implementation.
4) To understand the steps and activities in the ERP life cycle.
5) To identify and describe typical functionality in an ERP system.

DETAIL SYLLABUS

Unit-1   **10 Hours**

Introduction to Enterprise and ERP
• An overview of Enterprise
     o Introduction
     o Business Functions and Business Processes
     o Integrated Management Information
     o Role of the Enterprise in Implementing the ERP System
     o Business Modeling
• Introduction to ERP
     o Introduction
     o Common ERP Myths
     o A Brief History of ERP
     o The Advantages of ERP
     o Why ERP Package Now
     o Over Expectation in ERP
     o Roadmap for successful ERP implementation
     o The Role of CIO
• Basic Concepts of ERP
     o Will ERP fit the ways A Company does Business?
     o Why is ERP important to A Company?
     o ERP market has Grown and will continue to Grow
     o How does ERP create Value?

Unit-2   **10 Hours**

Risk, Benefits and Technologies related to ERP 10 hours
- Risks and Benefits of ERP
     - o Risks of ERP
     - o Risk Factors of ERP Implementation
          - People Issues
          - Process Risks
          - Technological Risks
          - Implementation Issues
          - Operation and Maintenance issues
     - o Benefits of ERP
          - Information Integration
          - Reduction of Lead-time
          - On-time Shipment
          - Reduction in Cycle Time
          - Improved Resource Utilization
          - Better Customer Satisfaction
          - Improved Supplier Performance
          - Increased Flexibility
          - Reduced Quality Costs
          - Better Analysis and Planning Capabilities
- ERP and Related Technologies
     - o Introduction
     - o Business Process Reengineering (BPR)
     - o Data Warehousing
     - o Data Mining
     - o On-line Analytical Processing (OLAP)
     - o Product Life Cycle Management (PLM)
     - o Supply Chain Management (SCM)
     - o Customer Relationship Management (CRM)
     - o Geographical Information Systems (GIS)
     - o Intranet and Extranets
     - o Advanced Technology and ERP Security
     - o Middleware
     - o Security and ERP

Unit-3   **10 Hours**

ERP – Functional Modules, ERP- Implementations
- ERP-Functional Modules
     - o Introduction
     - o Functional Module of ERP Software
          - Financial Module
          - Manufacturing Module
          - HR Module
          - Materials Management Module
          - Production Planning Module
          - Plant Maintenance Module
          - Quality Management Module
          - Purchasing Module
          - Marketing Module
          - Sales and Distribution Module

- ERP-Implementation
    - ERP-Implementation Basics
      Why ERP?
      Technological, Operational, and Business Reasons for Implementing ERP
      Implementation Challenges
    - ERP Implementation Life Cycle
        - Objectives of ERP Implementation
        - Different Phases of ERP Implementation

Unit-4   **10 Hours**
Success & Failure Factors of an ERP Implementation, Present & Future
- Success & Failure Factors of an ERP Implementation
    - Success Factors
    - Failure Factors
- Present and Future
    - ERP and eBusiness
        - eBusiness – Supply Chain Integration
        - The eBusiness Process Model
        - ERP / eBusiness Integration
    - ERP, Internet and WWW – ERP II
        - ERP, Internet and WWW
        - ERP to ERP II – Bringing ERP to the ERP Enterprise

TEXTBOOK:
Enterprise Resource Planning (Second Edition)
Publisher: McGraw Hill
By Alexis Leon
    Chapter - 1 (Excluding – Integrated Data Model)
    Chapter - 2 (Excluding – The Future of ERP Packages)
    Chapter - 3 (All the topics)
    Chapter - 4 (Risks of ERP, Risk Factors of ERP Implementation, Benefits of ERP)
    Chapter - 5 (Excluding – Technological Advancements, Computer Security, Crime
    Security)
    Chapter - 7 (Introduction, Functional Module of ERP Software)
    Chapter - 8 (All the topics)
    Chapter - 9 (Objectives of ERP Implementation, Different Phases of ERP
    Implementation)
    Chapter - 15 (Success Factors, Failure Factors)
    Chapter - 18 (eBusiness-Supply Chain Management, The eBusiness Process
    Model, ERP/eBusiness Integration)
    Chapter - 19 (ERP, Internet and WWW, ERP to ERP II – Bringing ERP to the Entire
    Enterprise)

REFERENCE BOOKS:
    1. ERP Demystified (Second Edition)
    Publisher: McGraw Hill
    By Alexis Leon
    2. Enterprise Resource Planning
    Publisher: MacMillan Publications
    By Mahadeo Jaiswal and Ganesh Vanapalli
    3. Enterprise Resource Planning (Edition-2008)

Course Title:	Customer Relationship Management
Course Code:	FC-302 (B)
Course Credit:	2
Session Per Week:	3
Total Teaching Hours:	40 Hours

AIM

The course would make students to understand the significance of customer relationship management in business. The course will create awareness regarding contemporary uses of eCRM in business.

LEARNING OUTCOMES

The student would be able

1) To obtain basic understanding of the Customer Relationship Management practiced in industry.
2) To understand how customer is important in a business.
3) To understand different terms like loyalty management, quality management and eCRM.

DETAIL SYLLABUS

Unit-1   **10 Hours**

Understanding CRM

• Customer relationship management
    o Definition
    o Framework
    o Scope and evolution
    o Core module of CRM
    o Technology and CRM
    o Levels of CRM
• Loyalty management
    o Loyalty management
    o Loyalty Programmes
    o Planning and Managing loyalty programmes
    o Types of loyalty programmes
    o Reasons of failure of loyalty programmes
• Service quality and service capacity planning
    o Service quality and CRM
    o Concept of service capacity
    o Service capacity planning process
    o Using queuing theory for service capacity planning
    o Analysis of a queue system

Unit-2   **10 Hours**

Customer-driven quality and quality management system

• Customer-driven quality and QMS

- o Quality and its relevance to CRM
- o Understanding customer-driven quality
- o Quality management
- o Quality policy
- o Quality objectives
- o Quality management system
- o Quality management system standard
- o Quality management principles
- o Quality system documentation
- o Implementation of quality management systems
- CRM and sales force automation
  - o Sales force automation
  - o Objectives of SFA
  - o Features of SFA
  - o Strategic advantages of SFA
  - o Key factors for successful SFA

Unit-3   10 Hours
eCRM, Planning and implement ting CRM
- eCRM
  - o What is eCRM?
  - o Benefits of eCRM
  - o Data handling in eCRM
  - o ECRM system/application in market
  - o Specification of eCRM solutions
- Planning and implement ting CRM
  - o Scope and significance of a CRM project
  - o Business process reengineering for CRM implementation
  - o CRM implementation process

Unit-4   10 Hours
Making CRM a success, IT solution of CRM and its integration, future of CRM
- Making CRM a success
  - o Success factor for CRM
  - o Business process reengineering for CRM implementation
  - o Data quality management
  - o Securing customer data: information security management system
  - o Ethical issue in CRM
- IT solution of CRM and its integration
  - o The eCRM project implementation road map
  - o Integrating CRM
  - o Integrating CRM and SCM
  - o Integrating CRM and SRM
  - o ERM
- Future of CRM
  - o Emerging technologies and CRM

TEXTBOOK:
CRM:Customer Relationship Management
Publisher: McGraw Hill
By Urvashi Makkar, Harinder Kumar Makkar

REFERENCE BOOKS:
1. Customer Relationship Management Concepts & Application
Publisher: Dreamtech Press
By Alok Kumar, Chhabi Sinha, Rakesh Sharma
2. Customer Relationship Management
Publisher: Dreamtech Press
By Dr. Jaspret Kaur Bhasin
3. Customer Relationship Management Getting It Right!
Publisher: Pearson
By Judith W. Kincaid

Course Title:	Search Engine Optimization
Course Code:	FC-302 (C)
Course Credit:	2
Session Per Week:	3
Total Teaching Hours:	40 Hours

AIM

This course would make students aware about different search engine optimization techniques. Also provide your site visible. This is the most effective way for the branding of your product on Google.

LEARNING OUTCOMES

The students will be able to ..

- Understand the main elements that help a website rank organically and in the paid search space in Google.
- Learn how to perform keyword research using Google's free tools.
- Learn how to develop landing pages that are search engine friendly.
- Learn how to carry out inbound linking practices.

DETAIL SYLLABUS

Unit-1   **10 hours**

- Basics for SEO: What is Domain?, Basic Knowledge of World Wide Web, Difference between Portal and Search Engines, What is SEO?, Types of SEO Techniques, Black hat techniques, White Hat techniques, How Search Engine works?
- SEO Research & Analysis: Market Research, Keyword Research and Analysis, Keyword opportunity, Competitors Website Analysis, SWOT Analysis of Website, How to Choose Best Keywords, Tools available for Keyword Research
- Website Design SEO Guidelines: Content Research, Content Guidelines, Content Optimization, Design & Layout, XML Sitemap & URL List Sitemap

Unit-2   **10 hours**

- On-page Optimization: The Page Title, Meta Descriptions & Meta Keywords, Headings, Bold Text, Domain Names & Suggestions, Canonical Tag, Meta Tags, Images and Alt Text, Internal Link Building, The Sitemap, Invisible Text, Server and Hosting Check, Robots Meta Tag, Doorway Pages, 301 Redirects, 404 Error, Duplicate content.

Unit-3   **10 hours**

- Off-page Optimization: Page Rank, Link Popularity, Link Building in Detail, Directory Submission, Social Bookmark Submission, Blog Submission, Articles, Links Exchange, Reciprocal Linking, Posting to Forums, Submission to Search Engine, RSS Feeds Submissions, Press Release Submissions, Forum Link Building, Competitor Link Analysis.

- Analytics: Google Analytics, Installing Google Analytics, How to Study Google Analytics, Interpreting Bars & Figures, How Google Analytics can Help SEO, Advanced Reporting, Webmaster Central & Bing/Yahoo, Open Site Explorer, Website Analysis using various SEO Tools available
- SEO Tools: Keyword Density Analyzer Tools, Google Tools, Yahoo / Bing Tools, Rich Snippet Text Tools, Comparison Tools, Link Popularity Tools, Search Engines Tools, Site Tools, Miscellaneous Tools.
- SEO Reporting: Google analysis, Tracking and Reporting, Reports Submission, Securing Ranks

TEXTBOOK:
Search Engine Optimization All-in-One for Dummies, 3rd Edition
Publisher: Allitebooks
Author Bruce Clay