YEAR-WISE AND SEMESTER-WISE DISTRIBUTION OF SUBJECTS
DEPARTMENT OF B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS
THIRD SEMESTER
ACADEMIC YEAR 2024-25 OF 2023-24 BATCH (CBCS)

Sl. No.	Part	Subject Code	Title of the Subject	Hours /Week	Duration of Exam (hrs.)	Marks			Credits
						Internal	External	Total	
1	I	ES23101	Environmental Studies and Gender Sensitization (AECC-5)	3	3	40	60	100	3
2	II	G21CSC1T	Introduction to Worksheet (GE-1) (ID)	2	3	40	60	100	2
3	II	CSC21301	Discrete Mathematics (Core-7)	5	3	40	60	100	4
4	II	CSC21302	Infrastructure Management (Core-8)	4	3	40	60	100	4
5	II	CSC21303	Virtualization and Cloud (Core-9)	4	3	40	60	100	4
6	II	CSC21304	Python Programming (Core-10)	4	3	40	60	100	4
PRACTICALS									
7	II	G21CSC1P	Worksheet Lab (GD-1)(ID)	2	3	40	60	100	1
8	II	CSC21305	Infrastructure Management Lab (core-8)	2	3	40	60	100	1
9	II	CSC21306	Virtualization and Cloud (Core-9)	2	3	40	60	100	1
10	II	CSC21307	Python Programming (Core-10)	2	3	40	60	100	1

Ability Enhancement Compulsory Course (AECC) * Generic Elective (GE) * Inter-disciplinary (ID)

P.V. Sridhar

PROFESSOR
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Osmania University
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GENERIC ELECTIVE

(INTER-DEPARTMENTAL/INTER-DISCIPLINARY)

UG COURSES

S.No.	Department	Subject
1.	Chemical Technology	Solar Processing Technologies
2.	Agri. Science & Rural Development	Fundamentals of Horticulture
3.	Biotechnology	Medical Lab Technology
4.	Food Technology	Food Processing & Quality Control
5.	Mathematics	Quantitative Aptitude
6.	Statistics	Data Analysis
7.	Multimedia & Animation	Creative Arts
8.	Computer Science &Engg.	PC Operating system
9.	Computer Systems &Engg.	PC Hardware, Installation and Networking
10.	B.Sc. Computer Data Science & Data Analytics Engg.	Python Programming
11.	B.Sc. Electronics Technology	Repair and Maintenance of Home Appliances
12.	Commerce (Honours)	Taxation
13.	Commerce (Advertising, Sales Promotion & and Sales Management)	Marketing Management
14.	Commerce (General)	Banking
15.	Commerce (Computers & IAF)	Accounting
16.	B.B.A.	Principles of Management
17.	Mass Communication	Photography
18.	Mass Communication	Film Appreciation
19.	English	Communication Skills
20.	English	Career Skills
21.	Psychology	Psychology for Living
22.	B.Sc. Computer Science & Cognitive Systems	Introduction to Worksheet

ENVIRONMENTALSTUDIES&GENDERSENSITIZATION

Credits: 3 **Semesters: III**
Subject Code: ES23301 **No. oflecture hours: 45**

Objectives:

- TounderstandtheimportanceofecologicalbalanceforSustainableDevelopment • Tounderstandtheimpactsofdevelopmentalactivitiesandmitigationmeasures
- To understand the environmental policies and regulations.
- To develop students' sensibility with regard to issues of gender incontemporaryI ndia
- To provide a perspective on the socialization of men and women
- To expose the students to debate on the politics and economic works and on gender violence.

Outcome:

- Studentswillgainknowledgeonenvironmental
- aspectsandinvolvethemselvesinacquiringasus tainableenvironment.
- Students will be sensitized towards gender issues in the society and the laws enforced for their protection.

Course Outcomes:

COl: Understand the importance of Environmental education, conservation of natural resources & understand the importance of ecosystems and biodiversity.
CO2: Understand the pollution problems and apply the environmental science knowledge on solid waste management, disaster management.
C03: Apply the environmental science knowledge to improve the resources Evaluate and understand the sustainable environmental conditions and control methods.
C04: Identify the interactions and inter sections of identities (e.g., gender, race, ethnicity class, sexuality, and so on) and assess the ways in which they contribute to instances of privilege and power dynamics across cultures, space, and time. And their problems
COS: Understand the gender problems and ways of addressing them, including interactions across local to global scales in communities and overcome inequalities with legislation

UNIT-I

NATURAL RESOURCES, ECOSYSTEMS & BIODIVERSITY **9hr**

Definition, Scope and importance of environmental studies. Need for public awareness.

Renewable & Non-Renewable resources, Brief account on Forests, Water, Minerals and Energy (Solar, Wind, and Geo-thermal & Bio-energy).

Definition of Ecosystem, Structure and functions-food chains, food webs, ecological pyramids, producers, consumers and decomposers. Energy flow and example ecosystems--F orest, Desert, Aquatic ecosystem

Definition of Biodiversity, types (Genetic, Species, Ecosystem), India-mega diversity Nation.

Hotspots, Threats to biodiversity, Conservation of biodiversity (In-Situ and Ex-Situ).

UNIT-II

ENVIRONMENTALPOLLUTION **9hrs**

Definition of Environmental pollution

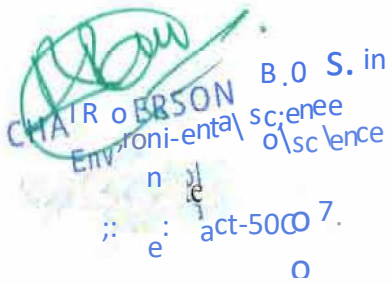
Brief account on causes, effects, prevention and control measures of

(a) Air pollution

(b) Water Pollution
(c) Soil pollution

((d)) Noise pollutionManne Pollution .

- Solid Waste Management: Causes, Effects & Control measures of urban and ir\g\1;1Jlia, Disaster Management: floods, Earthquakes, and Cyclones.



UNIT-III

Social Issues and Environment **9hrs**

- Rain-Water Harvesting, Water-shed Management, and From Unsustainable to Sustainable Development.
- Global Warming, Ozone depletion, and Acid rains
- Environmental Legislation: Air Act, Water Act, Environmental Protection Act, Forest Act, Wildlife Act.
- Environmental & Human Health-HIV/AIDS
- Welfare Programs-Family, Women & Child Welfare, Population Explosion
- Role of Information Technology in Environmental Studies.

UNIT-IV

Gender Studies **9hrs**

- Why should we study gender issues?
- Socialization-Making women and making men
- Being together as equals-Through the lens of gender
- Missing women: Gender selection and its consequences
- Health issues of Women

UNIT-V

Gender & Labour -Gender Violence & Law **9hrs**

- Housework: The invisible labour-my mother doesn't work "share the load"
- Women's Work: Role in Politics and Economics Fact and Fiction. Unrecognized and Unaccounted work. Wages and Conditions of Work.
- Sexualharassment–saynoeveteasing–thecaste-basedviolence–NirbhayaAct
- Domestic violence-Is home a safe place? - Blaming the victim. -Domestic violence Act
- Forums of justice-Hindu Inheritance Act (2005)

SUGGESTEDREADING:

- A. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu. 201. **Towards a World of Equals: A Bilingual Text on Gender**. Hyderabad: Telugu Akademi.
- Rajagopalan R.2015. **Environmental Studies-from Crisis to Cure.** Third Edition. Chennai: Oxford University Press.
- Dr D K Asthana and Dr Meera Asthana. 2014. **A Text Book of Environmental Studies** Revised Edition. New Delhi: S.Chand & Company.
- Anubha Kaushik and C.P. Kaushik Published. 2016. **Perspectives in Environmental Studies.** Fifth Edition. New Delhi: New Age International.

(for Gender Sensitization)

- Sen Amartya **More Than One Million Women Are Missing.** New York Review of Books 37.20 (20 December 1990). Print. **We Were Making History...Life Stories of Women in the Telangana People's Struggle**. NewDelhi: Kali for Women.1998.
- Tripti Lahiri. **By the Numbers: Where Indian Women Work. Women's Studies Journal.** /14November2012).Availableonlineat:<http://blogs.wsj.com/Indiarealtime/2012/11/14/by–thenumbers-where-Indian-women-work
- K. Satyanarayana and Susie Tharu. Ed. **Steel Nibs Are Sprouting: New Dalit Writing From South India, Dossier2: Telugu and Kanada** Code=3732.
- Vimala. **Vantillu (The Kitchen)". Women Writing in India: 600 Bc to the Present. VolumeII.** The 20th Century. Ed. Suise Tharu and K. Laltitha. Delhi: Oxford University Press, 1995. 599-601.
- Shatrughna, Veena. **Women's Work and its Impact on Child Health and Nutrition.** Hyderabad: National Institute of Nutrition, Indian Council of Medical Research.1993.

CHAIR PERSON B.O.S. in Environmental Science University College of Science Osmania University Hyderabad-500 007.

Introduction to Worksheet

(GE Inter-Disciplinary)

Credits : 2 **Semester: III**

Subject Code : G21CSC1T **No. of Lecture Hours: 30**

Objectives:

- To understand the basics of Excel and various functions
- To indicate the names and functions of the **Excel** interface components.
- To edit, construct formulas, create and modify charts.

Outcome: Students will be able to perform data analysis using excel.

UNIT-I **6 Hrs**

Introducing Excel

1. Understanding Use of Excel, Workbooks and Worksheets, moving around worksheets, Using the Ribbon 2
2. Exploring Data types, Entering text and values, date and times in worksheet, modifying Cell contents, apply number formatting 2
1. Working with excel windows, activating, adding, deleting, changing- name & sheet tab colour, Hiding and unhiding worksheets, working with rows and columns 2

UNIT-II **6 Hrs**

1. Understanding cells and ranges, working with tables 2
2. Using conditional formatting, working with conditional formats 2
3. Printing work sheets 2

UNIT-III **6Hrs**

Introducing Formulas and Functions

1. Understanding formula basics, Entering and Editing formulas, Using cell references 2
2. Using formulas in tables, Correcting Common formula errors 2
3. Using formula for mathematical operations and manipulating text 2

UNIT-IV **6 Hrs**

1. Using Formulas for Conditional Analysis, Matching and Lookups 2
2. Using Formulas for statistical analysis, array formulas 1
3. Excel charts-Chart, creating a chart, modifying and customizing chart, chart types 3

UNIT-V **6 Hrs**

1. Creating Spark line graphics, data validations 2
2. Introducing pivot tables, What-if Analysis-data tables, scenario manager, goal Seeking And solver 4

Essential Reading

1. Alexander, Michael. Kusleika, Dick, Walkenbach, John. **Excel 2019 Bible. 1st Edition. John Wiley & Sons, Inc.**

DISCRETE MATHEMATICS

Credits: 4 **Semester: III**

Subject Code: CSC21301 **No. of Lecture hours: 75**

Objective: To give an introduction to lattices, Graph theory and to familiarize with the basic Concepts of Number theory.

Outcome:

CO1: Develop understanding of Logic Sets and Functions
CO2: Evaluate and apply the fundamental concepts in graph theory
CO3: Develop an understanding of how graph and tree concepts are used to solve problems arising in the computer science.
CO4: Express the concepts and results of Number Theory.
CO5: Identify methods and techniques used in number theory.

UNIT- I **15Hrs**
Lattices

1. Relations and ordering	3
2. Partial order relations - Partially ordered sets	3
3. Hasse diagrams	3
4. Lattices - Properties of lattices	3
5. Types of Lattices	3

UNIT-II **15Hrs**
Graph theory- I

1. Definition of a graph, Degree of vertex	3
2. First theorem of graph theory Paths and connection	3
3. Isomorphism of graphs	3
4. Some special simple graphs	6

UNIT-III **15Hrs**
Graph theory-II

1. Planar graphs, Euler's formula	3
2. Euler graphs	3
3. Hamiltonian graphs- Grinberg theorem	4
4. Chromatic numbers	5

UNIT-IV **15Hrs**

Number Theory -I

1. Divisibility- Division algorithm 3
2. Euclid' algorithm 3
3. Properties of G.C.D 3
4. Diophantine Equation 3
5. Primes – Fundamental theorem of Arithmetic. 3

UNIT-V **15Hrs**

Number Theory -II

1. Congruence's – Properties 4
2. Applications of Congruences 4
3. Fermat's theorem and its Applications 4
4. Wilson's theorem and its Applications 3

ESSENTIAL READING

1. Tremblay, J.P and Manohar, R. 2007. **Discrete Mathematical Structures with applications to Computer Science.** New Delhi: Tata McGraw-Hill.(For Unit I)
2. Mott, J.L and Kandel. 2007. **Discrete Mathematics for Mathematicians and Computer Scientists.** 2nd Edition. New Delhi : PHI. (For Units II, III & IV)
3. Burton, David M. 2003**. Elementary Number theory.** 2nd Edition. New Delhi: Universal Book Stall. (For Unit V)

INFRASTRUCTURE MANAGEMENT

Credits:4 **Semester: III**

Subject Code: CSC21302 **No. of Lecture Hours: 60**

Objective: To gain expertise in Management and Monitoring of Infrastructure using System Center 2012

Outcome:

CO1: Demonstrate Installation and Managing Windows 10 Systems
CO2: Analyze Manaing Systems using System Center 2012
CO3: Demonstrate Deployment and Management of System Center 2012
CO4: Understand Managing and Monitoring Infrastructure using System Center 2012
CO5: Demonstrate Reporting of Infrastructure using System Center 2012

Unit I **12Hrs**

1. Introducing Windows 10	2
2. Overview of Deploying Windows 10	2
3. Configure Devices and Drivers	3
4. Perform Post installation Configuration Task	2
5. Managing Apps in Window.	3

Unit II **12Hrs**

1. System Center 2012 R2Configuration Manager Overview	2
2. SCCM Features and Capabilities	2
3. SCCM Setup & Installation	2
4. Configuration Manager Basics	2
5. Deploying SCCM Client	2
6. User and Device Collections in SCCM	2

Unit III **12Hrs**

1. Application Management using SCCM	2
2. Operating System Deployment using SCCM	2
3. Endpoint Protection using SCCM	2
4. Troubleshooting SCCM Server	2
5. Troubleshooting SCCM Clients	2
6. Creating Reports using SCCM Reports	2

Unit IV **12Hrs**

1. System Center 2012 R2 Operations Manager Overview 2
2. SCOM Features and Capabilities 2
3. SCOM Setup & Installation 2
4. Operations Manager Basics 2
5. Deploying SCOM Clients 2
6. Management Packs in SCOM 2

Unit V **12Hrs**

1. Managing & Administering SCOM Environment 2
2. Managing Alerts using SCOM 2
3. Creating Custom Management Packs and Alerts 2
4. Troubleshooting SCOM Server 2
5. Troubleshooting SCOM Clients 2
6. Creating Reports using SCOM Reporting 2

ESSENTIAL READING

- Ed Bott, Craig Stinson, "Windows 10 Inside Out", 2020.
- Kerrie Meyler, Gerry Hampson, "System Center Configuration Manager Current Branch Unleashed System" 1st Edition, 2018.
- Kevin Greene, "Getting Started with Microsoft System Center Operations Manager: Using SCOM 2016 TP 5, 2016.

VIRTUALIZATION AND CLOUD

Credits: 4 **Semester: III**

Subject Code: CSC21303 **No. of Lecture Hours: 60**

Objectives:

- To understand distributed systems and cloud concepts.
- To gain expertise in virtualization and data center.

Outcome:

CO1: Understand Distributed Systems and its Application.
CO2: Analyze Cloud Service Models and Deployment Models
CO3: Demonstrate Virtual Networks Configuring and Managing Virtual Storage
CO4: Understand vSphere Update Manager and Host Maintenance
CO5: Demonstrate Role of data center in cloud computing

Unit I **12Hrs**

1. **Distributed Systems**: Distribute a system –Distributed algorithm	2
2. Distributed Data Stores – Distributed Computing	2
3. File Systems – Distributed Messaging	2
4. Distributed Applications – Distributed Transaction	2
5. Parallel and distributed computing	2
6. Applications.	2

Unit II **12Hrs**

1. **Cloud Concepts:** Introduction Cloud Computing - Advantages of Cloud	2
2. Public Cloud - five essential characteristics	2
3. Three service models - Four deployment models	2
4. Benefits of Cloud Computing	2
5. Cloud Vendors	2
6. Traditional Infrastructure setup and Challenges, AWS.	2

Unit III **12Hrs**

1. **Virtualization :**Introduction to vSphere and the Software	2
2. Defined Data Center Creating Virtual Machines	2
3. VCenter Server - Configuring and Managing	2
4. Virtual Networks Configuring and Managing Virtual Storage	2
5. Virtual Machine Management	2
6. Resource Management and Monitoring.	2

Unit IV **12Hrs**

1. **Virtual Machines**: vSphere HA 2
2. vSphere Fault Tolerance 2
3. Protecting Data vSphere DRS 2
4. Network Scalability 2
5. vSphere Update Manager and Host Maintenance 2
6. Storage Scalability - Securing Virtual Machines. 2

Unit V **12Hrs**

1. **Datacenter:** Data center overview -Components - Provisions 2
2. Need of Data Center 2
3. Data Center Architecture 2
4. Different Racks 2
5. Data center architecture for cloud computing 2
6. Role of data center in cloud computing. 2

ESSENTIAL READING

1. Jean Dollimore formerly of Queen Mary, Tim Kindberg, "Distributed Systems Concepts and Design", 5th Edition Cambridge University, University of London
2. VenkataJosyula , Malcolm Orr , Greg Page, "Cloud Computing: Automating the Virtualized Data Center", 1st Edition.
3. Brian J.S. Chee, Curtis Franklin Jr., "Cloud Computing: Technologies and Strategies of the Ubiquitous Data Center", 1st Edition.

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PYTHON PROGRAMMING

Credits : 4 **Semester: III**
Course Code : CSC21304 **No. of Lecture Hours: 60**

Objectives:

- To help the students understand the fundamentals of object-oriented programming.
- To emphasize on learning important principles of software development and provide practice in developing small-scale programs.

Outcomes:

CO1: **Explain** the basics of Python Programming constructs.
CO2: **Sub divides** larger problems into smaller ones using functions
CO3: Apply various data structures for problem solving
CO4: **Apply** object-oriented programming features for solving a given problem
CO5: **Select** an appropriate exception handling depending on application and design file operations using Python standard library

UNIT – I **12Hrs**

1. **Basics of Python Programming:** Features of Python, History of Python, Future of Python, writing and executing first python program, Literal constants-Numbers, strings 2
2. Variables and Identifiers, Data types, Input Operation, comments, Reserved words 2
3. Operators and Expressions in Python, Other Data types-Tuples, dictionary, list. Type conversion 2
4. Decision control statements- if statement, if-else statements, Nested if ,if-elif-else 2
5. Basic Loop structure- while loop, for loop, selecting an appropriate loop, Nested loops, Break statement, continue statement, pass statement, else statement used with loops 4

UNIT- II **12Hrs**

1. **Functions and modules**-Need for functions, function definition, function call, variable scope and life time, Return statement, function definition using required argument, keyword argument, Default argument 3
2. Lambda functions, Recursive functions- Greatest common Divisor, finding exponents Fibonacci series 2
3. Modules—The from…import statement, Name of module, making your own module 2
4. The dir( ), the Python module, modules and Namespaces 2
5. Packages in Python, Standard Library modules, Function redefinition 3

UNIT- III **12Hrs**

1. **Python String: Introduction—**concatenating, Appending, multiplying strings, Strings are Immutable, string formatting operator 2
2. Built-in String methods and functions, slice operation 2
3. Ord( ) and chr( ) functions, in and not in operators, comparing and iterating strings 2
4. The String module, Regular Expressions—match( ),search( ),sub( ), findall( ), Finditer( ) functions, flag options. Meta characters in Regular expressions 2
5. **Data Structures**: Sequence, Lists, Functional programming: filter(),map() andreduce()function, Tuple, sets 2
6. Dictionaries—creating dictionary, adding, modifying ,sorting and deleting item in dictionary, looping and nested dictionary, built-in dictionary functions,difference between list and 2

dictionaries

UNIT- IV **12 Hrs**

1.	**Classes and objects-**Introduction, defining classes, creating objects, data abstraction	2
2.	Class method and self argument, The __init_ () method, class variables and object variables, The del () method, other special methods, public and private data members, private methods	2
3.	Calling a class method from another class method, built-in functions to check, Get, Set and Delete Class Attribute, Built-in class attribute	2
4.	**Inheritance :** Introduction, inheriting classes in Python, Types of Inheritance	2
5.	Composition or containership or complex objects, abstract classes and interfaces Meta class	2
6.	**Operator overloading**—Introduction, Implementing operator overloading, reverse Adding	2

UNIT- V **12 Hrs**

1.	**Error and Exception Handling**- Introduction to errors and exceptions, handling exceptions	1
2.	Multiple except blocks, multiple exception in a single block, except block without exception	1
3.	Raising Exceptions, Instantiating exceptions, handling exceptions in invoked functions, Built-in and user defined exceptions, the finally block	2
4.	**File Handling**-Introduction, File path, Types of Files-ASCII text file ,Binary file, opening and closing files	2
5.	**Reading and writing files**-write(), writelines(),append(),readline()	1
6.	File positions, renaming and deleting files, Directory methods	2
7.	**GUI Programming**: Graphical User Interfaces, Using the tkinter Module, Display text with Label Widgets, Organizing Widgets with Frames, Button Widgets and Info Dialog Boxes, Getting Input with Entry Widget, Using Labels as Output Fields, Radio Buttons, Check Buttons.	3

ESSENTIAL READING

1. Thareja, Reema. 2017. **Python Programming**. 3rd Edition. New Delhi: Oxford HED
2. Tony Gaddis. **Starting Out With Python.** 3rd Edition

SUGGESTED READING

1. BalaGuruSwamy, E. 2017. **Problem Solving and Python Programming**. 1st Edition. McGraw Hill Education
2. Dr. R. NageshwaraRao. 2018. **Core Python Programming**. 2nd Edition. DreamTech Press

WORKSHEET LAB
(GE Inter-Disciplinary)

Credits : 1 **Semester : III**
Course Code : G21CSC1P **No. of Practical Hours: 30**

Objective: To understand basics of Excel and various functions
Outcome: Students will be able to apply Excel for data analysis.

No. of Hrs	Topic
1-4	Programs on functions like text, math, statistical
6-7	Programs on graphs and charts, spark lines
8-9	Programs on lookup, arrays and conditional formatting
10-12	Programs on what-if analysis, sorting, filtering
13-15	Programs on validation, consolidation, pivot tables

INFRASTRUCTURE MANAGEMENT LAB

Credits : 1 **Semester : III**
Course Code : CSC21305 **No. of Practical Hours: 30**

Objective: To gain expertise in administrating and managing System Center 2012
Outcome: Students will be able to demonstrate, configuring and monitoring web operations

Exercises

- Working with SCCM
- Working with SCOM

VIRTUALIZATION AND CLOUD LAB

Credits : 1 **Semester : III**
Course Code : CSC21306 **No. of Practical Hours: 30**

Objective: To gain expertise in virtualization and cloud data center.
Outcome: Students will be able to demonstrate hypervisors and AWS.

Exercises

- Working with hypervisors
- Creating account in AWS
- Exploring AWS services like –
  - storage,
  - machine image,
  - pricing models,
  - data bases

PYTHON PROGRAMMING LAB

Credits : 1 **Semester: III**

Course Code : CSC21307 **No. of Practical Hours: 30**

Objectives:

- To strengthen problem solving ability by applying the characteristics of an object oriented approach in Python.
- To build software for real world applications.
- To implement frontend of an application

Outcome: Students will be able to develop applications using object-oriented concepts of varying complexities.

No. Of hours	Topics
1-3	Basic programs on data types and operators, decision and loop control structure
4-5	Programs on different functions and modules
6-7	Programs on various string operations, regular expressions and various data structures: lists, tuples.
8-9	Programs on dictionary operations and classes and objects
10-11	Programs on inheritance and operator overloading
12-13	Programs on errors and exception handling
14-15	Programs on file handling and GUI Programming

YEAR-WISE AND SEMESTER-WISE DISTRIBUTION OF SUBJECTS
DEPARTMENT OF B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS
FOURTH SEMESTER
ACADEMIC YEAR 2024-25 OF 2023-24 BATCH (CBCS)

Sl. No.	Part	Subject Code	Title of the Subject	Hours /Week	Duration of Exam (hrs.)	Marks			Credits
						Internal	External	Total	
1	II	**BS23401**	**Probability & Statistics (GE-2) (DS)**	4	3	40	60	100	4
2	II	CSC21402	Object Oriented Systems Development (SEC-3)	3	3	40	60	100	3
3	II	CSC21403	Artificial Intelligence (Core-11)	4	3	40	60	100	4
4	II	**CSC24404**	**DBMS (Core-12)**	4	3	40	60	100	4
5	II	CSC21405	Process Management (Core-13)	4	3	40	60	100	4
6	II	CSC21406	Java Programming (Core-14)	4	3	40	60	100	4
PRACTICALS									
7	II	CSC21407	Object Oriented Systems Development Lab (SEC-3)	2	3	40	60	100	1
8	II	**CSC24408**	**DBMS Lab (Core-12)**	2	3	40	60	100	1
9	II	CSC21409	Java Programming Lab (Core-14)	2	3	40	60	100	1
10	II	CSC21410	Mini Project (SEC-4)	1	3	40	60	100	1
	Total			**30**	-	400	600	1000	**27**

*Generic Elective (GE) Discipline-Specific * Skill Enhancement Course (SEC)

P.V. Sudha

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PROBABILITY & STATISTICS
(Proposed)

(GE Discipline-Specific)

Credits: 4 **Semester:IV**

SubjectCode: BS23401 **No. of Lecture Hours: 60**

Objective:

To teach concepts and applications of Statistics in real life situations

Outcome:

CO1: Calculate the mean, median, and mode of a set of data and **identify** the importance of measures of dispersion.

CO2: Use discrete and continuous probability distributions, including requirements and making decisions.

CO3: Employee the principles of linear regression and correlation, including least square method, predicting a particular value of Y for a given value of X and significance of the correlation coefficient.

CO4: **Knowledge** about formulating and testing a hypothesis, using critical values to draw conclusions and determining probability of making errors in hypothesis tests, and about large sample tests.

CO5: Understand and **analyze** various methods of small sample tests.

NOTE: APPLICATION ORIENTED ONLY. NO MATHEMATICAL DERIVATIONS.

UNIT– I **12hrs**

5. Various measures of Central Tendency – Mean, Median &Mode 3
6. Definitions, Merits, Demerit, Problems (grouped and ungrouped data)
7. Various measures of dispersion - Standard Deviation and Variance 3
   Definitions, Merits, Demerit, Problems (grouped and ungrouped data)
8. ProbabilityBasic terminology, Addition theorem problems, 3
   Multiplication theorem problems,
9. Bayes theorem problems (Derivations for theorems not included) 3

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UNIT– II **12hrs**

4. **Random Variable:** Discrete Random variable & Continuous Randomvariable Probability Mass &Density functions. 3
5. **Mathematical Expectation**: Mathematical Exception,
6. Addition Theorem of expectation ,Multiplication theorem of expectation. **3**
   (Excluding Derivations –Problemsonly)
7. **Theoretical Distributions:** Discrete distributions: Binomial distribution, 3
   Fitting of binomial distribution, Poison distributions, Fitting of poisson distribution
8. **Normal Distribution** : Chief characteristics of the normal distribution, 3
   area of a property, Importance and fitting of a normal distribution.

(Excluding derivations –Applications only for all distributions mentioned above)

UNIT– III **Correlation and Regression** **12Hrs**

1. Simple correlations(definitions and types) 6
2. Karl Pearson coefficient of correlation
3. Rankcorrelation 3
4. Regression and regression lines (Problems only) 3

UNIT– IV **12hrs**

1. **Testing of Hypothesis:** Sampling distribution, the null hypothesis and type I and IIerrors,Critical region and levelofsignificance. 2
2. Tests of significance for large samples
3. Test of single proportion 2
4. Test of significance of difference ofproportions 2
5. Test of significance for single mean and difference ofmeans 2
6. Test of significance for difference of standarddeviations. 2

UNIT – V **12Hrs**

1. **Small Sample Tests: Chi – Square test**: Population Variance 4
   Goodness of fit Independence of attributes(Problems only)
2. **T- test :** Single Mean Difference means and paired t-test(Problems only) 4
3. **F-test:** Test of significance based on equality of two variances(Problems only) 4

ESSENTIAL READING

3. Gupta, S. C. (2011). ***Fundamentals of statistics*** (pp. 18-1). New Delhi, India: Himalaya publishing house.
4. Gupta, S. P. (1978). **Statistical Methods** 1978. 46th Edition.

SUGGESTED READING

3. Deovre, J. (1987). **Probability and statistics for engineering and science**. *Brooks/Cole, Belmont, CA.*
4. Richard A. Johnson, Miller, Freund. **Probability & Statistics for Engineers**. PHI Publications

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OBJECT ORIENTED SYSTEMS DEVELOPMENT

Credits:3 **Semester: IV**
Subject Code: CSC21402 **No. of Lecture Hours: 45**

Objectives:

- To introduce object oriented concepts in systems development.
- To teach various development methodologies and design models which will help the students in their projects.

Outcome:

CO1: **Explain** basics of OOSD concepts
CO2: Categorize Object oriented methodologies and UML diagrams.
CO3: Choose classification theory and performing case studies.

CO4: Design models based on Object oriented concept.

CO5: Identify software quality, system usability, measuring and satisfaction

UNIT – I **9Hrs**

1. **Object oriented system development** – Introduction	1
2. Object Basics– Objects, classes, state and properties	1
3. Behaviour, methods, messages,	1
4. Encapsulation, class hierarchy, polymorphism	2
5. Relationships and associations	1
6. Aggregations and containment	1
7. Object identify and static and dynamic binding, persistence, Meta classes	2

UNIT – II **9Hrs**

1. **Object oriented system life cycle**– Analysis Design, Prototyping	1
2. Implementation and Incremental testing.	1
3. Object oriented Methodologies –Unified approach	1
4. **UML** – Introduction , class diagrams ,Use case diagram ,Interaction diagram	2
5. Sequence diagram, collaboration diagram, state chart diagram	2
6. Activity diagram, component diagram, Deployment diagram	2

UNIT – III **9Hrs**

1. **Object Oriented Analysis** - Identifying use cases- Introduction 1
2. Business object analysis, Use- case model 1
3. developing effective documentation, case studies 1
4. **Classification**- classification theory 1
5. classes, responsibilities, collaborators, naming classes 1
6. Object relationships, attributes and methods- associations 1
7. Super and sub-class relationships, a part – of relationship 1
8. Class responsibilities, identifying attributes and methods 1
9. Object responsibility, defining methods and messages, case studies. 1

UNIT – IV **9Hrs**

1. **Object Oriented Design** - Object oriented design process and design axioms 1
2. Corollaries, design and patterns 2
3. **Designing classes** – Introduction, Designing classes-the process 1
4. Class visibility, refining attributes, case studies 2
5. **Access Layer-** Database management systems , Object Oriented Database management systems 3

UNIT – V **9Hrs**

1. **Software Quality Assurance** – Introduction, QAT 1
2. Testing strategies- Black Box Testing, White Box Testing, Top-Down Testing, Bottom-Up Testing 2
3. Impact of Object Oriented testing, test cases, test plan 2
4. Continuous testing, case studies 2
5. **System Usability and measuring user satisfaction** – Introduction, Usability testing, user satisfaction test, user satisfaction test template 2

ESSENTIAL READING

1. Bahrami, Ali. 1999. **Object Oriented System Development.** New Delhi: McGraw-Hill.

SUGGESTED READING

1. Jacbson Ivor, Booch Grady and Rumbaugh James, 2008. **The Unified Software Development Process**, India: Pearson Education

ARTIFICIAL INTELLIGENCE

Credits:4 **Semester: IV**
Subject Code: CSC21403 **No. of Lecture Hours: 60**

Objectives: To introduce basic aspects of Artificial intelligence, utilizing and analyze AI techniques for identifying optimal solutions to search strategies.

Outcomes:

CO1: Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
CO2: Understand predicate logic and transform the real life information in different representation.
CO3: Understand formal methods of knowledge representation
CO4: Demonstrate Knowledge representation techniques.
CO5: Analyze the underlying mathematical relationships and build expert system

UNIT-I

Introduction **12 Hrs**

1. Introduction to AI	1
2. Applications of AI	2
3. History of AI	2
4. Types of AI, Intelligent agents	2
5. Types of agents	2
6. Agent environment	2
7. Turing test in AI	1

UNIT-II **12 Hrs**

Search Algorithms - Types of Search Algorithms

1. Uninformed Search –Breadth First Search, Uniform Cost Search	3
2. Depth First Search, and Depth Limited Search	3
3. Iterative Deepening Depth First Search, Bidirectional Search	3
4. Informed search -Best first search, A* search	3

UNIT-III **12 Hrs**

Adversarial search – Types of Games in AI

1. MIN –MAX Algorithm and its Working	6
2. Alpha Beta Pruning and its Working	6

UNIT-IV **12 Hrs**

Knowledge Representation:

1. Knowledge Base Agents 2
2. Knowledge Representation Techniques 2
3. The Wumpus World 2
4. Propositional Logic 2
5. First Order Logic 2
6. Forward Chaining and Backward Chaining 2

UNIT-V **12 Hrs**

Subset of AI:

1. Expert systems 3
2. Machine learning and NLP 3
3. Future of AI 3

ESSENTIAL READING

1. Kaushik, Saroj. 2011. **Artificial Intelligence**. First Edition. Cengage Learning India.

SUGGESTED READING

1. Russell, Norvig. 2004. **Artificial Intelligence: A Modern Approach**. 3rd Edition. Pearson Education

DATABASE MANAGEMENT SYSTEMS

(Proposed)

Credits:4
Semester:IV

SubjectCode: CSC24404 **No. of Lecture Hours:60**

Objectives:

- To form the basis for the bulk management ofdata.
- To offer the power to logically present the databases to individual usage aswell.
- To provide facilities for data access, enforcing data integrity, managing concurrencyand restoring the data frombackups.

Outcome:

CO1: Represent logical database using Entity Relationship and Enhanced ER model.

CO2: Formulate database using relational algebra and organize relation using normalization

CO3: Design SQL queries and implements PL/SQL.

CO4: Classify the storage and file structure, storage access, indexing and hashing techniques of the database

CO5: Explain the concept of Transactions, recovery system and concurrency control.

UNIT – I

	12Hrs
1. **Introduction**: Introduction to DBMS, System Structure	2
2. DDL, DML	2
3. Data Dictionary, Data Base Administrator, DBA	2
4. Database Levels, Data Independence	2
5. Data Base Design and E-R Model: Entity–Relationship Model, Properties, Constraints and Occurrences	2
6. **Enhanced Entity Relationship Model**: Generalization, Specialization, Aggregation, Design Considerations.	2

UNIT – II

	12Hrs
1. **Relational Model**: Structure	
2.R2. Reduction to Relational Schema	2
3.RelationalAlgebra	2
4. Modification of the Database	2
5.Normalization:First, Second,	2
6.Third Normal form and BCNF	2

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UNIT – III **12Hrs**

1. **SQL** : Data Definition, Basic Structure of SQL Queries	1
2. Set Operations, Aggregate Functions	2
3. Null Values, Nested Sub Queries	2
4. Joins, Modifications of the Database, Views	2
5. **PL/SQL** : Programming, Procedures	1
6. Triggers, Cursors	1
7. Application Design &Development: Authorization in SQL–Granting of Privileges	1
8.Granting Privileges in SQL, Roles, Revoking of Privileges, Authorization on Views, Functions and Procedures	1
9. Application Security –Encryption Techniques	
6.Third Normal Forms and BCNF	1
	2

UNIT-IV **12Hrs**

1. File Organization, Organization of Records in Files	1
2. **Indexing and Hashing:** Index sequential, B+ tree index	2
3. Static Hash Function, Dynamic Hash Function	1
4. Comparison of Hashing and Indexing	1
5. **Database System Architecture**: Centralized, Client-Server & Server System Architectures	2
6. Distributed Databases: Homogeneous & Heterogeneous Databases, Cloud-Based Databases	3
7. Concurrency Control in Distributed Databases	2

UNIT – V **12Hrs**

1. **Recovery System**: Failure Classification	1
2 Transactions: Transaction Concept, States	1
3.Implementation of Atomicity and Durability, Concurrent Executions	1
4. Serializability, Testing for Serializability	1
5.**Concurrency Control** : Lock Based Protocols	2
6. Locks, Granting of Locks, Two-Phase Locking Protocol, Dead Lock Handling	2
7.**Vector Databases :**Introduction, Difference between Vector Index and Vector database, How it works.	2
8. **Graph databases**: Introduction, Graph database types, How graphs and graph databases work, Advantages of graph databases	2

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ESSENTIAL READING

1. Korth Henry F. Abraham SilberSchatz and Sudarshan S. 2021 Database System Concepts7th Edition New Delhi: Tata McGraw-Hill
2. Bayross, Ivan. 2009. **SQL, PL/SQL (The Programming Language of Oracle).** 4th Revised Edition. New Delhi: BPBpublications.
3. https://www.pinecone.io/learn/vector-database/
4. https://www.oracle.com/in/autonomous-database/what-is-graph-database/

SUGGESTED READING

1. McFadden, Fred R. Hoffer, Jeffrey A and Prescott, Mary B. 1999. **Modern Database Management**. 5th Edition. Asia: Pearson Education.

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PROCESS MANAGEMENT

Credits:4 **Semester: IV**
Subject Code: CSC21405 **No. of Lecture Hours: 60**

Objectives:

- To introduce software process models and agile methodologies.
- To understand Devops, Lean UX and Agile anti-patterns.

Outcome:

CO1: **Explain** basics of software engineering process models
CO2: Understand agile methodologies and scrum roles.
CO3: Demonstrate Agile and Devops.

CO4: Explain Lean UX and Agile anti-patterns.

CO5: Classify design thinking and lean thinking

Unit I **12Hrs**

1. **Software and software Engineering:** The Nature of Software	1
2. The Unique Nature of WebApps	1
3. Software Engineering, Software Process	1
4. Software Engineering Practice, Software Myths.	1
5. **Software Process Model:** A Generic Process Model	2
6. Process Assessment and Improvement	1
7. Perspective Process Models	2
8. Specialized Process Models	2
9. The Unified Process.	1

Unit II **12Hrs**

1. **Agile:** Agile Methodology, Manifesto, Principles of Agile	2
2. Agile Methodologies,	3
3. Challenges with Agile.	1
4. **Scrum:** Overview of Scrum, Scrum Roles,	2
5. Scrum Ceremonies, Scrum Artifacts,	2
6. Extreme programming vs Scrum.	2

Unit III **12Hrs**

1. **Devops:** Introduction to Devops, Principles, Automation 2
2. Performance Measurement through KPIS and Metrics 2
3. Agile and Devops 2
4. Agile Infrastructure 2
5. Velocity 2
6. Lean Startup UPS. 2

Unit IV **12Hrs**

1. **Lean UX and Agile Anti-Patterns :** Sprint -Staggered sprints 1
2. Sprint zero and design sprints 2
3. Dual-track Agile 1
4. Listening to Scrum's rhythms 2
5. Participation, Design is a team sport 2
6. Coordinating multiple Lean UX teams, Managing up and out 2
7. Agile anti-patterns. 2

Unit V **12Hrs**

1. **Design Thinking**: Introduction to Design Thinking, Lean thinking. 3
2. **Actionable Strategy:** The Problem with Complexity, Vision and Strategy, Defining Actionable Strategy. 3
3. **Act to Learn**: Defining your Beliefs and Assumptions, Decide what to learn and how to learn, Research and Experiments for Learning, Problem Validation. 3
4. **Leading Teams to Win:** Purpose-Driven Autonomy, Mission Command, All Together Now, Techniques for Communicating Purpose and Progress, Techniques for Prioritizing Value. 3

ESSENTIAL READING

- Roger S Pressman, "Software Engineering A Practioners Approach", 7th Edition 2010
- KalloriVikraman, "Introduction to Devops", 1st Edition, 2016.
- Stephen Haunts, "Essential of Scrum" Addison-Wesley Professional; 1st Edition, 2012
- Jeff Gothelf, Josh Seiden, "Lean UX", 2nd Edition, 2016.
- Jonny Schneider, "Understanding Design Thinking, Lean, and Agile" O'Reilly Media 2017.
- Jeff Gothelf , "Lean vs. Agile vs. Design Thinking"Sense and Respond Press,2017.

JAVA PROGRAMMING

Credits : 4 **Semesters: IV**
Subject Code: CSC21406 **No. of Lecture Hours: 60**

Objectives:

- To be used for internet computing.
- To emphasize on learning Object oriented concepts, file handling, creating user defined packages, creating GUI, deploying web applications and accessing the database

Outcome:

CO1: Understand fundamentals of object oriented concept, classes, objects and methods
CO2: Apply inheritance, packages and exceptional handling techniques
CO3: Demonstrate Threads and applet programming.
CO4: Express event handling and swing components.
CO5: Design interactive programs using swing

UNIT – I **12Hrs**

1. Fundamentals of Object oriented concepts, Java Evolution and overview	2
2. Variables, Data types and Arrays, Operators and Control Statements	2
3. Class Fundamentals, declaring objects and methods	2
4. Constructor, this Keyword	2
5. Overloading methods, Objects as parameters	2
6. Access control, static, command line arguments	2

UNIT – II **12Hrs**

1. Inheritance, multilevel hierarchy, super, method overriding	2
2. Dynamic Method Dispatch, Abstract classes, using final	2
3. Package-package access, importing packages and classes, user defined package	2
4. Interface-define, implement and extending Interface, Multiple inheritance	2
5. Exception handling: try-catch, multiple catch, Nested try, throw, throws, finally, user defined exception	2

UNIT – III **12Hrs**

1. Multithreading- Thread Model, Main Thread, Creating a Thread, isAlive (), join ()	2
2. Thread priorities, Synchronization.	2
3. String class, Wrapper class	2

4. String methods. 2
5. Applet class-basics, architecture, life cycle, applet tag, passing parameters, animation 2
6. Working with frames, fonts, color, Graphics and displaying images in applet. 2

UNIT-IV **12Hrs**

1. Event Handling: The delegation event model, Event classes-Action event, Mouse Event, Window Event, Item Event, Key Event 2
2. Sources of Event, Event listeners-Action listener, Mouse listener, Mouse motion, Window listener, Key Listener. 2
3. Layout manager-card, grid, flow and border. 2
4. Swing- MVC architecture, components and containers 1
5. Swing control- JLabel and ImageIcon, JTextField,JButton 1
6. JRadioButton, JCheckbox, JToggleButton, JTextArea. 2
7. JPasswordField, JCombobox, JTable, JOptionPane 2

UNIT-V **12Hrs**

1. JTree, JList, JMenu. 3
2. JScrollBar, JSplitPane, 3
3. Input-output- File- directories, File Name Filter, Reading and Writing Files, File Reader and File Writer 3
4. **RMI:** Architecture, registry service, Parameter passing in Remote Methods, Creating RMI Application and steps involved in running RMI application. 3

ESSENTIAL READING

1. Schildt, Herbert. 2002. **The Complete reference Java2.** New Delhi: Tata McGraw Hill

SUGGESTED READING

1. Deitel, P.J.Deitel, H.M. **Java for Programmers, Java: How to Program**. PHI.
2. Gaddis,Tony. **Starting Out with Java**. Dream Tech Press
3. Balagurusamy, E. **Programming with Java, A Primer**. 3rd Edition. New Delhi: TMH.

JAVA PROGRAMMING LAB

Credits : 1 **Semester: IV**
Subject Code : CSC21409 **No. of Practical Hours: 30**

Objective: To learn Java Programming with object-oriented concepts.
Outcome: Students will be able to create applications using object oriented concepts.

1. Programs on control statements and looping statements.
2. Programs on operators.
3. Programs on classes, objects and methods.
4. Programs on arrays.
5. Programs on constructors.
6. Programs on overloading methods.
7. Programs on command line arguments.
8. Program to demonstrate on static keyword.
9. Program on access modifiers.
10. Programs to demonstrate on inheritance.
11. Illustrate the method of overriding in Java.
12. Program to demonstrate dynamic dispatch.
13. Program to implement abstract class to find area and perimeter.
14. Program to demonstrate on interface.
15. Program to illustrate the keywords i)super ii)final
16. Program to illustrate the multiple inheritance by using Interfaces.
17. Create a package called "Arithmetic" that contains methods for arithmetic operations.
18. Define an exception called "Marks Out of Bound" Exception.
19. Program by using try, catch- multi-catch, finally, throw blocks.
20. Program for multi-thread concept. (Use Odd and Even number)
21. Program to demonstrate the concept of synchronization by suitable code.
22. Program to demonstrate Inter thread communication by suitable example.
23. Programs on Applets.
24. Programs on Event classes.
25. Programs on Event listener interfaces.
26. Programs on Layout managers.
27. Programs on swing controls.
28. Program that displays the number of characters, lines and words in a file.
29. Program to copy the contents of a file.
30. Program to read and display the file contents.
31. Program for random access to file.
32. An applet program to display the file contents.

OBJECT ORIENTED SYSTEMS DEVELOPMENT LAB

Credits:1 **Semester: IV**

Subject Code: CSC21407 **No. of practical hours: 30**

Objective: To introduce case tools for system development.

Outcome: Students will be able to demonstrate object oriented analysis and design documents using Unified Modelling Language.

Students have to perform the following on a given Case Study:

- Use Case Modelling
- Structural Modelling
- Behavioural Modelling
- Architectural Modelling

The output should consist of:

- Use case Diagrams
- Class Diagrams
- Sequence Diagrams
- Collaboration Diagrams
- State Chart Diagrams
- Activity Diagrams
- Deployment Diagrams
- Component Diagrams

Note: Students should form into groups. They should carry out the Case Study as a group activity.

The lab should be carried out using a CASE Tool. Finally they should submit a report.

DATABASE MANAGEMENT SYSTEMS LAB

Credits: 1 **Semester: IV**
Subject Code: CSC24408 **No. of practical hours: 30**

Objective: To present the concepts and techniques relating to query processing bySQL

Outcome: Students will be able to use commercial relational database system (Oracle) by writing Queries using SQL and implement PL/SQL

List of Programs:

1. Create Employee Table with the following Fields
   Eno, ename, joining date, salary, job, commission, deptno

Eno	Ename	Salary	Job	Commission	Joiningdate	Deptno
1	Sita	5000	Clerk	800	12-jan-90	10
2	Rita	8000	Salesman	600	25-mar-02	20
3	Geetha	54000	HR	700	11-jun-05	30
4	Rahul	8900	Finance	850	15-dec-10	10
5	swetha	15000	Marketing	900	18-sep-09	20

   Execute the following Queries
   1. Insert atleast 5 records
   2. Write a query to display the data in table as follows:
   3. Write a query to eliminate duplicate rows using select statement
   4. Write a query to sort the data in a table
   5. Write a query to create a table from another table
   6. Write a query to creating a table from a table by specifying certain condition
   7. Write a query to insert data into a table from another table
   8. Write a query to creating a table from a table by specifying certain condition
   9. Write a query to modify the structure of the table
   10. Write a query to drop a column from a table
   11. Queries using Aggregate Functions, Sub Queries
2. Create department table with the following fields
   Deptno,deptname,Location

Deptno	Department Name	Location
10	Clerk	New York
20	Sales	Sydney
30	Hr	Dallas
10	Finance	Texas
20	marketing	North Carolina

Execute the following on EMP & Dept database

1. Orderby clause
2. Date Functions
3. Group By Clause
4. Sub Queries
5. Group Functions
6. Joins
7. Set Operators
8. Views

3. Create Table Student with the following Fields sno,sname,group,marks,percentage

Sno	Group	Sub1	Sub2	Total Marks	percentage
1	BA	53	78	131	54
2	BSC	86	45	131	64
3	BCOM	79	23	102	51
4	BBA	42	98	140	70
5	MSC	56	46	102	51

Execute the Following Queries:

1. Write a query to find the average of marks of Student table
2. Write a query to find the minimum value of marks of student table
3. Write a query to find the maximum value of marks of student table
4. Write a query to implement count function in student table
5. Write a query to implement sum function in student table

PL/SQL Programs

1. PL/SQL to add two numbers
2. PL/SQL to find factorial of a number
3. PL/SQL for demo on for loop
4. PL/SQL for case structure
5. PL/SQL/ for simple loop
6. PL/SQL to increase the value by 10
7. PL/SQL for performing arithmetic operations
8. PL/SQL to find square, cube, double of a number
9. PL/SQL program to swap two numbers
10. PL/SQL program to find multiplication table
11. PL/SQL to determine whether a year is leap year or not
12. PL/SQL to delete an item whose itemnum=4
13. PL/SQL program for inverting a number
14. PL/SQL program to calculate the area for circle for value of radius ranging from 3 to 7
15. Write a program to print empno, ename, job and salary of an employee given empno
16. Write a PL/SQL block that will increase the salary by 100 if salary is greater than 1000 for a empno
17. Write a PL/SQL block using the cursor to display details of all employee's from emp table whose sum of sal and commission is greater than 2000
18. PL/SQL to update salary of an employee whose empno and increment mentioned
19. Write a PL/SQL block which accepts the empno from the user and display the details of the employee. When the user enters an empno that is not in the emp table then PL/SQL block must display an appropriate message

to the user

20. PL/SQL that creates a trigger that inserts or update values of ename, job as lower case strings
21. PL/SQL to implement standalone procedure in INOUT mode
22. PL/SQL to create a function to findout total number of Employees in the emp table
23. PL/SQL to handle ZERO_DIVIDE Expection.

MINI PROJECT EVALUATION CRITERIA

Credits : 1 **Semester: IV**
Subject Code : CSC21410 **No. of Practical Hours: 15**

Second year students in the fourth Semester are required to take up a mini project work which carries a total of 100 marks i.e. internal 40 marks and external 60 marks.

Students can take up projects in the area of Computer Science and Cognitive Systems only. Students can choose any programming language and it should be the one relevant to the course of study.

The Criteria for the Internal Evaluation of Project for 40 marks is as follows:

1. Attendance 5 marks
2. Review of literature 5 marks
3. Internal Project Presentation 10 marks

(Presentation, communication skills, objectives, work submission,

Methodology, results, and practical relevance)

4. Final internal presentation 10 marks

(50% marks Evaluation done by the internal guide, and 50% marks evaluated by other internal lecturers guiding the projects).

5. Project Report 10 marks

External Evaluation of the Project (60 marks): The Controller of Examination appoints an external examiner who evaluates Project Reports. The viva-voce examination is conducted on the Project work done by the student. The Project Report is evaluated for 40 marks and Viva for 20 marks.