C24_CURRICULUM

DIPLOMA IN COMPUTER SCIENCE & ENGNEERING

Offered By

STATE BOARD OF TECHNICAL EDUCATION AND TRAINING TELANGANA HYDERABAD

IV SEMESTER

S.NO	Course		Teaching Scheme					Examination Scheme						
			Instruction Periods per week			Total Periods per semester	Credits	Continuous Internal Evaluation (CIE)			Semester End Examination (SEE)			
	Code	Course Name	L	T	P			Mid Sem 1	Mid Sem 2	Internal Evaluation	Max marks	Min marks	Total Marks	Min marks for passing including internal
1	SC-401	Advanced Engineering Mathematics	4	1	0	75	2.5	20	20	20	40	14	100	35
2	CS-402	Java Programming	4	1	0	75	2.5	20	20	20	40	14	100	35
3	CS-403	Python Programming	4	1	0	75	2.5	20	20	20	40	14	100	35
4	CS-404	Relational Database Management Systems	4	1	0	75	2.5	20	20	20	40	14	100	35
5	CS-405	Cryptography & Network Security	4	1	0	75	2.5	20	20	20	40	14	100	35
6	CS-406	Operating Systems	4	1	0	75	2.5	20	20	20	40	14	100	35
7	CS-407	Java Programming Lab	1	0	2	45	1.25	20	20	20	40	20	100	50
8	CS-408	Python Programming Lab	1	0	2	45	1.25	20	20	20	40	20	100	50
9	CS-409	Relational Database Management Systems Lab	1	0	2	45	1.25	20	20	20	40	20	100	50
10	HU-410	Employability Skills Lab	1	0	2	45	1.25	20	20	20	40	20	100	50
			28	6	8	630	20	200	200	200	400	164	1000	410

SC-401 - ADVANCED ENGINEERING MATHEMATICS

Course Title	Advanced Engineering Mathematics	Course Code	SC-401
Semester	IV	Course Group	Foundation
Teaching Scheme in Periods (L : T : P)	4:1:0	Credits	2.5
Methodology	Lecture + Tutorial	Total Contact Periods	75
CIE	60 Marks	SEE	40 Marks

Pre requisites:

This course requires the knowledge of Engineering Mathematics at Diploma first year level and Applied Engineering Mathematics at Diploma 3rd Semester level.

Course Outcomes (Cos):

At the end of the course, the student will have the ability to:

CO 1	Solve Differential Equations of first order and first degree with appropriate method
CO 2	Solve the higher order Homogeneous Linear Differential Equations with constant coefficients.
CO 3	Solve the Higher order Non-Homogeneous Linear Differential Equations with constant coefficients.
CO 4	Expand given functions as a Fourier Series in the given intervals.
CO 5	Find the Laplace Transforms of simple functions using its properties.
CO 6	Solve Linear Differential Equations with constant coefficient by using Laplace and inverse Laplace Transformations.

Course Contents:

Unit – I **Duration: 15 Periods (L:12 – T:3)**

Differential Equations of First Order and First Degree:

Definition of a Differential Equation - Order and Degree of a Differential Equations-Formation of Differential Equations - Solutions of Ordinary Differential Equations of first order and first degree: Variable Separable Method, Homogeneous Differential Equations, Exact Differential Equations, Linear

Differential Equations and Bernoulli's Equation-Problems leading to engineering applications by using above methods.

Unit – II **Duration: 10 Periods (L: 8– T:2)**

Higher order Homogeneous Linear Differential Equations with constant coefficients:

Homogenous Linear Differential Equations with constant coefficients of second and higher order- - Problems leading to engineering applications.

Unit-III **Duration: 12 Periods (L: 10 – T: 2)**

Higher order Non-Homogeneous Linear Differential Equations with constant coefficients:

Complimentary Function (C.F), Particular Integral (P.I) and General Solution (G.S) of Non-Homogeneous Linear Differential Equations with constant coefficients- Second and Higher order Non-Homogenous Linear Differential Equations with constant coefficients of the form $f(D)y = X$, where $f(D)$ is a polynomial in D and X is in the form k(a constant), e^{ax}, Sin (ax), Cos ax, x^n $(n= 1,2,3)$- Related engineering problems with emphasis on second order Non-Homogeneous Linear Differential Equations.

Unit – IV

Fourier Series: **Duration: 13 Periods (L:10 – T:3)**

Periodic functions - Orthogonality Property of Trigonometric functions - Representation of a function as Fourier series over the interval $(c, c + 2\pi)$ - Euler's formulae - Sufficient conditions for existence of Fourier series for a function $f(x)$ - Fourier series of functions over the interval $(0, 2\pi)$ and $(-\pi, \pi)$ - Fourier series of odd and even functions in the interval $(-\pi, \pi)$.

Unit – V

Laplace Transformations: **Duration: 12 Periods (L: 10 – T: 2)**

Definition of Laplace Transform -Sufficient conditions for Existence of Laplace Transform, Laplace Transform of some elementary functions -Linearity Property -First Shifting Theorem - Laplace Transforms of Derivatives - Laplace Transforms of Integrals - Multiplication t^n -Division by t - Related problems.

Unit – VI **Duration: 13 Periods (L:10 – T:3)**

Inverse Laplace transforms and Applications of Laplace Transformations:

Definition of Inverse Laplace Transform- Inverse Laplace Transform of elementary functions – Linearity Property – First Shifting Theorem - Inverse Laplace Transforms by using Partial fractions - Inverse Laplace Transform of Derivatives - Inverse Laplace Transform of Integrals - Multiplication by s^n Division by *s*-Definition of Convolution of two functions –Convolution Theorem (without proof) and its Applications -Applications of Laplace Transforms in solving Second order Linear Differential Equations with constant coefficients under the Initial conditions-Problems leading to engineering applications.

Reference Books:

1. Advanced Engineering Mathematics-Erwin Kreyszig, John Wiley Publications.
2. Advanced Engineering Mathematics- R.K. Jain and S.R.K. Iyengar, Narosa Publications.
3. Higher Engineering Mathematics-B.S.Grewal, Khanna Publications.
4. Laplace Transforms - Murray R. Spigel, Schaum's Outline Series, McGRAW-HILL.
5. Integral Transforms – A.R. Vasishtha and R. K. Gupta,Krishnan Prakashan Publications.

Suggested E-Learning references:

1. https://www.khanacademy.org/
2. https://www.wolframalpha.com/
3. https://onlinecourses.swayam2.ac.in/
4. http://tutorial.math.lamar.edu/

Suggested Learning Outcomes:

At the end of the course, the student will have the ability to:

1.0 Solve Differential Equations in engineering problems

1.1 Explain the concept of Differential Equations.

1.2 Classify the Differential Equations.

1.3 Find the order and degree of Differential Equations.

1.4 Form a Differential Equation by eliminating arbitrary constants.

1.5 Solve the first order first degree Differential Equations by using Variables Separable Method.

1.6 Solve the first order first degree Homogeneous Differential Equations.

1.7 Solve the first order first degree Exact Differential Equations

1.8 Solve the first order Linear Differential Equation of the form $\frac{dy}{dx} + \text{Py} = \text{Q}$,where P and Q are functions in *x* alone or constants.

1.9 Solve the first order Bernoulli's equations of the form $\frac{dy}{dx} + \text{Py} = \text{Q}y^n$,where P and Q are Functions of *x* alone or constants.

1.10 Solve the problems leading to engineering applications by using above methods.

2.0. Solve the Higher order Homogeneous Linear Differential Equations with constant coefficients.

2.1 Solve Differential Equations of the type:$a\frac{d^2y}{dx^2} + b\frac{dy}{dx} + c = 0$,where *a*, *b* and *c* are constants, when the roots of the Auxiliary Equation are real & distinct.

2.2. Solve Differential Equations of the type:$a\frac{d^2y}{dx^2} + b\frac{dy}{dx} + c = 0$,where *a*, *b* and *c* are constants, when the roots of the Auxiliary Equation are real & equal.

2.3 Solve Differential Equations of the type: $a\frac{d^2y}{dx^2} + b\frac{dy}{dx} + c = 0$,where *a*, *b* and *c* are constants, when the roots of the Auxiliary Equation are complex conjugate pair.

2.4 Solve the Higher order Homogeneous Linear Differential Equations with constant coefficients.

3.0. Solve the Higher order Non-Homogeneous Linear Differential Equations with constant coefficients.

3.1 Explain the concept of Complementary Function and Particular Integral to get General Solution of Non-Homogeneous Linear Differential Equation with constant coefficients.

3.2 Solve the Higher order Non-Homogeneous Linear Differential Equations of the type *f*(*D*) *y* = *X*, where *f*(D)is a polynomial in*D*and *X* is a function of the form: *k* (constant) and e^{ax}.

3.3 Solve the Higher order Non-Homogeneous Linear Differential Equations of the type *f*(*D*) *y* = *X*, where *f*(D) is a polynomial in *D* and *X* is a function of the form: Sin *ax* and Cos *ax.*

3.4 Solve the Higher order Non-Homogeneous Linear Differential Equations of the type *f*(*D*) *y* = *X*, where *f*(D) is a polynomial in*D*and *X* is a function of the form x^n (*n* = 1, 2, 3).

3.5 Solve engineering problems with emphasis on second order Non-Homogeneous Linear Differential Equations by using above methods.

4.0 Expand given functions as a Fourier Series in the given intervals.

4.1 Define Periodic function with examples

4.2 Explain the Orthogonality Property of functions in an interval.

4.3 Define the Fourier series of a function in the interval $(c, c+2\pi)$ and state Euler's Formulae for determining the Fourier coefficients.

4.4 Write the sufficient conditions for the existence of Fourier series for a function.

4.5 Expand Fourier series of functions in the range $(0, 2\pi)$ and $(-\pi, \pi)$.

4.6 Expand Fourier series for even and odd functions in the interval $(-\pi, \pi)$.

5.0. Laplace Transforms:

5.1 Define Laplace Transform.

5.2 Explain sufficient conditions for existence of Laplace Transform.

5.3 Obtain Laplace Transforms of some elementary functions.

5.4 State the Linearity Property of Laplace transforms.

5.5 State the First Shifting Theorem on Laplace Transforms.

5.6 Explain the Laplace transform of $f'(t)$and $f^{(n)}(t)$in terms of Laplace transform of *f*(t).

5.7 Explain the Laplace transform of $\int_0^t f(u)du$ in terms of Laplace transform of *f*(t).

5.8 Explain the Laplace transform of $t^n f(t)$in terms of Laplace transform of *f*(t).

5.9 Explain the Laplace transform of $\frac{f(t)}{t}$ in terms of Laplace transform of *f*(t).

5.10 Solve problems on above methods.

6.0 Inverse Laplace transforms:

6.1 Define Inverse Laplace Transform and write Inverse Laplace Transforms of standard functions.

6.2 State the Linearity Property of Inverse Laplace transforms.

6.3 State the First Shifting Theorem on Inverse Laplace Transforms.

6.4 Solve problems on Inverse Laplace transforms using Partial fractions.

6.5 Explain Inverse Laplace transforms of the functions: $s^n f(s), \frac{f(s)}{s}, f^{(n)}(s), \int_s^\infty f(u)du.$

6.6 Solve the problems on 6.2, 6.3, 6.4 and 6.5.

6.7 Acquire the knowledge of convolution of two functions and state the convolution theorem.

6.8 Evaluate Inverse Laplace transforms of simple functions using Convolution Theorem.

6.9 Use Laplace and Inverse Laplace Transforms to solve second order Linear Differential Equations

with constant coefficients under the initial conditions.

6.10 Solve the problems leading to engineering applications.

Suggested Student Activities:

1. Student visits Library to refer Standard Books on Mathematics and collect related material.
2.Quiz.
3. Group discussion.
4. Group Tests.
5. Surprise tests.
6. Seminars.
7. Home Assignments.
8. Mathematics for preparing competitive exams and solving old question papers on Arithmetical ability.

CO-PO Mapping Matrix

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	Mapped POs
CO1	3	2	1				3	1,2,3, 7
CO2	3	2					3	1,2, 7
CO3	3	2					3	1,2, 7
CO4	3	2	1				3	1,2, 3,7
CO5	3	2	1				3	1,2, 3,7
CO6	3	2	1				3	1,2,3,7

QUESTION PAPER PATTERN FOR MID SEMESTER EXAMS

MID SEM-I EXAM

S.No	Unit No	R	U	A	Remarks
1	Unit-I	1,2	5(a)	7(a)	
			5(b)	7(b)	
2	Unit-II	3,4	6(a)	8(a)	
			6(b)	8(b)	
Total Questions		4	4	4	

MID SEM-II EXAM

S.No	Unit No	R	U	A	Remarks
1	Unit-III	1,2	5(a)	7(a)	
			5(b)	7(b)	
2	Unit-IV	3,4	6(a)	8(a)	
			6(b)	8(b)	
Total Questions		4	4	4	

Semester End Examination

Unit No	Questions to be set for SEE				
	R			U	A
I	4	1		9(a)	13(a)
II					
III		2		10(a)	14(a)
IV					
V		3	5,6	9(b), 11(a), 11(b)	13(b), 15(a), 15(b)
VI			7,8	10(b), 12(a), 12(b)	14(b), 16(a), 16(b)
Total Questions	8			8	8

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA
DIPLOMA EXAMINATIONS (C - 24)
SC-401
SEMESTER IV, MID –I EXAM, MODEL PAPER
ADVANCED ENGINEERING MATHEMATICS
(Open Book System)

Duration : 1: 00 Hour **Max. Marks: 20**

PART-A

Instructions: 1. Answer **ALL** questions. 04 × 01 = 04

2 Each question carries **ONE** mark.

1. Find the order and degree of the differential Equation $\left(\frac{d^3y}{dx^3}\right)^4 + 3\left(\frac{d^2y}{dx^2}\right)^3 - 5\frac{dy}{dx} + y = 0.$
2. Find the Integrating Factor of $(1+x^2)\frac{dy}{dx} + 2xy = \frac{1}{1+x^2}.$
3. Find the roots of auxiliary equation of the differential equation $(2D^2 + 5D - 3)y = 0.$
4. Write the auxiliary equation of the differential equation $a_3\frac{d^3y}{dx^3} + a_2\frac{d^2y}{dx^2} + a_1\frac{dy}{dx} + a_0y = 0.$

PART-B

Instructions: 1. Answer **ALL**questions. 02 × 03 = 06

2. Each question carries **THREE** marks.

5(a) Form the differential equation by eliminating arbitrary constants A and B in the family of curves $y = Acos\,mx + Bsin\,mx$, where *m* is a constant.

OR

5(b) Solve $\frac{dy}{dx} - ytanx = 0.$

6(a) Solve $6\frac{d^2x}{dt^2} - \frac{dx}{dt} - 2x = 0.$

OR

6(b) Solve $(D^2-4)^2y = 0.$

PART- C

Instructions: 1. Answer **ALL** questions 02 × 05 = 10

2. Each question carries **FIVE** marks

7(a) Solve $xy^3dy = (x^4 + y^4)dx.$

OR

7(b) Solve $(x^4 - 2xy^2 + y^4)dx - (2x^2y - 4xy^3 + siny)dy = 0.$

8(a) Solve $(D^3 + 3D^2 - 4)y = 0.$

OR

8 b) Solve $(D^3 - 8)y$ =0.

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA
DIPLOMA EXAMINATIONS (C - 24)
SC-401
SEMESTER IV, MID –II EXAM, MODEL PAPER
ADVANCED ENGINEERING MATHEMATICS
(Open Book System)

Duration: 1: 00 Hour **Max. Marks: 20**

PART-A

Instructions: 1. Answer **ALL** questions. 04 × 01 = 04

2. Each question carries **ONE** mark.

1. Find the Particular Integral of $(D^2 - 5D + 6)y = e^{-x}$.
2. Find the Complementary Function of $2\frac{d^2y}{dx^2} + 3\frac{dy}{dx} - 5y$ = 6 sin 2x.
3. Find a_0 for f(x) = x Cos x in $-\pi < x < \pi$.
4. Find b_1 for f(x) =x in $0< x < 2\pi$.

PART-B

Instructions: 1. Answer **ALL** questions. 02 × 03 = 06

2. Each question carries **THREE** marks.

5(a) Find Particular Integral of $(D^2 - D - 6)y = e^x cosh 3x$.

OR

5(b) Solve $(D^2 + 2025)y = \sin 45x$.

6(a) Calculate a_1 in the Fourier series expansion of f(x) = x sin x in the interval (– π, π).

OR

6(b) Find the value of b_n in the expansion of Fourier series for the function f(x) = e^{3x}, where 0 <x< 2 π.

PART- C

Instructions: 1. Answer **ALL** questions 02 × 05 = 10

2. Each question carries **FIVE** marks

7(a) Solve $(D^2 - 3D + 2)y = e^x$ if y = 3 and $\frac{dy}{dx} = 3$, when x = 0.

OR

7 (b) Solve $y'' + y = x, y(0) = y'(0) = 1$.

8(a) Obtain Fourier series expansion of $|x^3|$ in the interval $(-\pi, \pi)$.

OR

8(b) Obtain Fourier series expansion of $f(x) = \begin{cases} x \ if \ 0 < x < \pi \\ 2 \ if \ \pi < x < 2\pi \end{cases}$.

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA
DIPLOMA EXAMINATIONS (C - 24)
SC-401
SEMESTER IV, SEMESTER END EXAM, MODEL PAPER
ADVANCED ENGINEERING MATHEMATICS

(Open Book System)

Duration: 2: 00 Hours **Max. Marks: 40**

PART-A

Instructions: 1. Answer **ALL** questions. 08 × 01 = 08
2 Each question carries **ONE** mark.

1. Find the order and degree of the Differential Equation $2y''' - 3y' = y$.
2. Find the Particular Integral of $(D^2 + 1)y = e^{\frac{x}{2}}$
3. Find $L(e^{-5t} + 7)$.
4. Verify the differential equation $(x + 2y - 2025)dy - (2x - y + 2024)dx = 0$ is homogeneous or not.
5. Find $L(5\cos 3t + 7\sinh 2t)$.
6. Find $L(te^{\omega t})$.
7. Find $L^{-1}\left(\frac{s}{s^2+81}\right)$.
8. Find $L^{-1}\left(\frac{3}{(s-3)^2}\right)$.

PART-B

Instructions: 1. Answer **ALL** questions. 04 × 03 = 12
2. Each question carries **THREE** marks.

9(a) Solve $(9D^2 - 24D + 16)y = 0$.

OR

9(b) Evaluate $L(2\cos^2 3t)$.

10(a) Solve $(D^2 + D - 2)y = 16$.

OR

10(b) Evaluate $L^{-1}\left(\frac{6}{s^2-4s+7}\right)$.

11(a) Evaluate $L(2\cos^2 3t)$.

OR

11(b) Evaluate $L(5e^{3t}\cosh 2t)$.

12(a) Evaluate $L^{-1}\left(\log\left(\frac{s-2}{s+3}\right)\right)$.

OR

12(b) Evaluate $L^{-1}\left(\frac{1}{s^2(16+s^2)}\right)$.

PART- C

Instructions: 1. Answer **ALL** questions. 04 × 05 = 20

2. Each question carries **FIVE** marks.

13(a) Solve: $x\log x\frac{dy}{dx} + y = \frac{\log x}{x}$.

OR

13(b) Evaluate $L\left[e^{2t}\left(\frac{1-\cos 3t}{t}\right)\right]$.

14(a) Obtain the Fourier series expansion of the function f(x) = $|\sin x|$ in $(-\pi, \pi)$.

OR

14(b) Evaluate $L^{-1}\left(\frac{s}{(s+1)^2(s^2+1)}\right)$.

15(a) Evaluate $L(f(t))$, where $f(t) = \begin{cases} t & if\ 0 \le t < 2 \\ 3 & if\ t \ge 2 \end{cases}$.

OR

15(b) Evaluate $L\left((t^2 + 2t + 3)\sin 2t\right)$.

16(a) Evaluate $L^{-1}\left(\frac{1}{(s+1)(s+3)}\right)$ using Convolution Theorem.

OR

16(b) Solve the Differential Equation $\frac{d^2x}{dt^2} + 4x = 0$, when $y(0) = y'(0) = 1$ by using Laplace Transform method.

CS-402 JAVA PROGRAMMING

Course Title:	**JAVA PROGRAMMING**	Course Code	**CS-402**
Semester	**IV Semester**	Course Group	**Core**
Teaching Scheme in Periods (L:T:P)	**4:1:0**	Credits	**2.5**
Methodology	**Lecture+Tutorials**	Total Contact Periods	**75**
CIE	**60 Marks**	SEE	**40 Marks**

Pre requesites

Knowledge of OOPs concepts and C, C++ Programming language concepts.

Course Outcomes

Upon completion of the course, the student shall be able to

CO1	Understand the basics of java programming.
CO2	Develop java programs using Inheritance and interfaces.
CO3	Creating user-defined packages and Develop Applet programs
CO4	Handle events generated by AWT controls
CO5	Interpret different types of Exceptions and Handle Exceptions
CO6	Understand Multi threading concepts and Develop database applications to interact with different types of databases using JDBC

Course Content and Blue Print of Marks for SEE

<table>
<tr><th rowspan="2">Unit No</th><th rowspan="2">Unit Name</th><th rowspan="2">Periods</th><th colspan="4">Questions to be set for SEE</th></tr>
<tr><th colspan="2">R</th><th>U</th><th>A</th></tr>
<tr><td>I</td><td>Fundamentals of Java</td><td>10</td><td rowspan="6">Q4</td><td rowspan="2">Q1</td><td rowspan="2">Q9(a)</td><td rowspan="2">Q13(a)</td></tr>
<tr><td>II</td><td>Inheritance and Interfaces</td><td>10</td></tr>
<tr><td>III</td><td>Packages and Applets</td><td>10</td><td rowspan="2">Q2</td><td rowspan="2">Q10(a)</td><td rowspan="2">Q14(a)</td></tr>
<tr><td>IV</td><td>AWT and Event handling</td><td>15</td></tr>
<tr><td>V</td><td>Exception Handling</td><td>15</td><td rowspan="2">Q3</td><td>Q5,Q6</td><td>Q9(b),Q11(a), Q11(b)</td><td>Q13(b),Q15(a), Q15(b)</td></tr>
<tr><td>VI</td><td>Multithreaded programming and JDBC</td><td>15</td><td>Q7,Q8</td><td>Q10(b),Q12(a), Q12(b)</td><td>Q14(b),Q16(a), Q16(b)</td></tr>
<tr><td></td><td>Total</td><td>75</td><td colspan="2">8</td><td>8</td><td>8</td></tr>
</table>

Course Contents

UNIT - 1: Fundamentals of Java

Duration: 10 Periods (L: 8– T:2)

Java history - Java Features - How Java Differs from C and C++- Java Program Structure - Simple Java Program - Java Tokens – Java data types – variables - arrays - operators - selection statements – iteration statements –break, and continue statements - classes and objects-constructors - method overloading- 'this' pointer-static and final members-string classes and methods - command-line arguments.

UNIT - 2: Inheritance and Interfaces

Duration: 10 Periods(L:8 – T:2)

Inheritance: Different types of inheritance with examples- super keyword- method overriding - avoid overriding using 'final'.

Interfaces - class vs. interface - extending and implementing interfaces - scope of variables in interfaces - multiple inheritance using interface.

UNIT - 3: Packages and Applets

Duration: 10 Periods(L:8 – T:2)

Packages - Java API Packages- Using System Packages– Creating packages – Accessing a Packages – Adding a class to a package - importing packages

Applets – Life cycle of an Applets – Creation of Applets

UNIT – 4 : AWT and Event handling

Duration: 15 Periods (L:13– T:2)

AWT classes - AWT controls – Handling events - Delegation Event model - Event Classes and Event Listener interfaces-Mouse and Keyboard events.

UNIT - 5: Exception Handling

Duration: 15Periods(L:13– T:2)

Types of errors - exceptions and types of Exceptions - general form of exception-handling block - Multi-catch statements - Nested try statements –finally block- user-defined exceptions -

UNIT - 6: Multithreaded programming and JDBC

Duration: 15 Periods(L:13 – T:2)

Define thread – life cycle of thread - Creating Threads- Multi threading - Using Thread Methods - Thread priority –Synchronization- isAlive( ), join( ), suspend( ), resume( ) methods - Inter thread communication – Dead locks

JDBC - JDBC Architecture - establish connection to database - statements used in JDBC- ResultSet - DDL and DML programs using JDBC

Reference Books

1. Programming with Java, 6th edition, Balagurusamy, Mc Graw Hill, ISBN 13-9789351343202 ISB 10- 9351343200
2. Complete Reference Java J2se, Herbert Schildt, Tata McGraw Hill, ISBN 9780070598782
3. Java 6 Programming – Black Book Wiley India Pvt ltd
4. Programming in JAVA2 – Dr. K. Somasundaram Jaico Publish
5. Programming in JAVA – S.S. Khandare – S. Chand Publish
6. "Head First Java", Kathy Sierra, Bert Bates, O'Reilly.
7. 'Effective Java: A Programming Language Guide' (Java Series) 2nd Edition, by Joshua Bloch Sun copyright.
8. Core Java Volume I--Fundamentals Eleventh Edition by Cay S. Horstmann Pearson publications.
9. Java: A Beginner's Guide, Seventh Edition Paperback – by Herbert Schildt -Oracle press
10. "The Complete Reference Java2 (Third Edition)", Patrick Naughton-Herbert Sheild, Tata McGraw hill.
11. "Java2 Unleased", Jawroski, Techmedia.
12. "Java2 Programming", Keyur Shah, Tata McGraw.
13. "Java Database Programming with JDBC" by Pratik Patel - The Coriolis Group.

Suggested E-learning references

1. https://www.w3schools.in/java-tutorial/
2. http://www.Javatpoint.com/Java-tutorial
3. https://www.geeksforgeeks.org/java/
4. https://www.tutorialspoint.com/java/index.htm
5. https://www.programiz.com/java-programming

Suggested E-modules

1. https://onlinecourses.nptel.ac.in/noc22_cs47/preview
2. https://nptel.ac.in/courses/106105191
3. https://archive.nptel.ac.in/courses/106/105/106105191/
4. https://www.youtube.com/watch?v=eIrMbAQSU34
5. https://www.youtube.com/watch?v=GoXwIVyNvX0

Suggested Learning Outcomes

For achieving Course outcomes, the following learning outcomes must be achieved

CO1: Understand the basics of java programming.

1.1 Recall Java History
1.2 Explain the features of Java
1.3 Compare Java with C and C++.
1.4 Explain the structure of Java program with a program.
1.5 Contrast java tokens -white space, literals, separators, keywords.

1.6 Illustrate java data types.
1.7 Demonstrate about declaration and initialization of variables.
1.8 List various types of operators.
1.9 Outline various selection and iteration statements with syntax.
1.10 What is the syntax of break, continue statements.
1.11 Explain one-dimensional and two–dimensional arrays.
1.12 Create classes and objects.
1.13 Explain about constructors.
1.14 Explain method overloading.
1.15 Utilize 'this' pointer.
1.16 Explain the working of static and final members.
1.17 Explain string class methods – charAt(), CompareTo(), concat(), length(), uppercase(), lowercase(), stringequals(), replace(), trim(), indexOf().
1.18 Make use of command-line arguments.

CO2: Develop java programs using Inheritance and interfaces.

2.1 Define Inheritance and its types.
2.2 Explain different types of inheritance with examples.
2.3 Utilize super keyword.
2.4 Explain method overriding and how to avoid overriding using 'final'.
2.5 Define an Interface and explain the concept of Interfaces.
2.6 Compare class and interface.
2.7 Explain about extending interfaces.
2.8 Explain the concept of implementing interfaces.
2.9 Outline the scope of variables in interfaces.
2.10 Explain multiple inheritance using the concept of interface.

CO3: Creating user-defined packages and Develop Applet programs

3.1 Define a package.
3.2 Explain about java API packages.
3.4 Examine the concepts of Access specifiers.
3.5 Explain Creating, accessing a package
3.6 Explain Creating and accessing a subpackage
3.7 Illustrate importing packages
3.8 Define Applet.
3.9 Interpret the life cycle of an Applet
3.10 Illustrate the creation of an Applet with example programs.

CO4: Handle events generated by AWT controls

4.1 List and discuss AWT classes
4.2 Explain AWT controls – Label, Button, check box and check box group with example programs
4.3 Explain AWT controls – Text Box, Text Area with example programs
4.4 Explain AWT controls – Choice, List and scrollbar with example programs
4.5 Illustrate Event handling with Delegation event model.
4.6 List sources of Events

4.7 List Event Classes and Event Listener interfaces.
4.8 Explain Mouse and Keyboard events.

CO5: Interpret different types of Exceptions and Handle Exceptions

5.1 Explain the types of errors.
5.2 Define Exception
5.3 Interpret different types of Exceptions.
5.4 Explain the general form of exception-handling block.
5.5 Explain the concept of Multi-catch statements with example programs.
5.6 Demonstrate Nested try statements
5.7 Outline throw and throws clauses.
5.8 Distinguish between throw and throws
5.9 Explain About finally block
5.10 Explain creation of user-defined exceptions

CO6: Understand Multithreading concepts and Develop database applications to interact with different types of databases using JDBC

6.1 Define Thread and life cycle of a thread
6.2 Show thread priorities.
6.3 Explain the process of creating thread using Thread class and Runnable interface.
6.4 Write about the creation of multiple threads.
6.5 Explain the concept of synchronization
6.6 Discuss about isAlive(), join(), suspend(), resume() methods.
6.7 Explain Inter thread communication.
6.8 Illustrate about dead lock with example programs.
6.9 Outline JDBC and JDBC Architecture.
6.10 Explain how to establish connection to database.
6.11 Implement Simple Application and execute query.
6.12 List different statements used in JDBC.
6.13 Discuss about ResultSet.
6.14 DDL and DML programs using JDBC.

Suggested Student Activities

Student activity like mini-project, surveys, quizzes, etc. should be done in group of 3-5 students.

- Each group should do any one of the following type activity or any other similar activity related to the course and before conduction, get it approved from concerned course coordinator and program co-coordinator.
- Each group should conduct different activity and no repeating should occur.
  1. Study different Integrated Development Environments (IDEs) available for executing java programs and prepare a report.
  2. Visit Library to refer to standard Books on core Java, collect related material and prepare notes.
  3. Interact with industry people who are working in java technologies and prepare a report.

4. Write assignments given by course coordinator.
5. Read all the course contents and should be able to write slip tests and surprise tests.
6. Prepare a seminar on a specific topic that is related to latest technologies in the java and advanced java concepts and present a Power Point Presentation (PPT) to all the peers.
7. Study IEEE papers on advanced java topics and submit a report.
8. Prepare quiz on java course related questions and conduct.
9. Participate in state level or national level technical conferences.
10. Participate in various technical coding competitions related to java programming.
11. Develop some projects to design websites like Hotel Management System,

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	
CO1	2	1	2	3			2	1,2,3,4,7
CO2	3	2	1	1			2	1,2,3,4,7
CO3	2	1	3	1		2	1	1,2,3,4,6,7
CO4	2	2	3	1		3	2	1,3,6,7
CO5	2	1		1		2	1	1,2,4,6,7
CO6	2	1	2	2	.	2	2	1,2,3,4

QUESTION PAPER PATTERN FOR MID SEMESTER EXAMS

Sl.No	Description	Level	No of Questions	Marks for each question	Choice	Total Marks
01	Part-A	Remembering(R)	4	1	Nil	4 Marks
02	Part-B	Understanding(U)	4	3	2	6 Marks
03	Part-C	Application(A)	4	5	2	10 Marks
Total Marks						20 Marks

MID SEM-I EXAM

S.No	Unit No	R	U	A	Remarks
1	Unit-I	1,2	5(a)	7(a)	
			5(b)	7(b)	
2	Unit-II	3,4	6(a)	8(a)	
			6(b)	8(b)	
Total Questions		4	4	4	

MID SEM-II EXAM

S.No	Unit No	R	U	A	Remarks
1	Unit-III	1,2	5(a)	7(a)	
			5(b)	7(b)	
2	Unit-IV	3,4	6(a)	8(a)	
			6(b)	8(b)	
Total Questions		4	4	4	

The length of answer for each question framed in respect of Part-A, B&C shall not exceed ¼ of a page,1 page and 2 pages respectively

QUESTION PAPER PATTERN FOR SEMESTER END EXAM

Sl.No	Description	Level	No of Questions	Marks for each question	Choice	Total Marks
01	Part-A	Remembering(R)	8	1	Nil	8 Marks
02	Part-B	Understanding(U)	8	3	4	12 Marks
03	Part-C	Application(A)	8	5	4	20 Marks
Total Marks						40 Marks

<table>
<tr><td rowspan="2">Unit No</td><td colspan="3">Questions to be set for SEE</td></tr>
<tr><td colspan="2">R</td><td>U</td><td>A</td></tr>
<tr><td>I</td><td rowspan="7">Q4</td><td colspan="2" rowspan="2">Q1</td><td rowspan="2">Q9(a)</td><td rowspan="2">Q13(a)</td></tr>
<tr><td>II</td></tr>
<tr><td>III</td><td colspan="2" rowspan="2">Q2</td><td rowspan="2">Q10(a)</td><td rowspan="2">Q14(a)</td></tr>
<tr><td>IV</td></tr>
<tr><td>V</td><td rowspan="2">Q3</td><td>Q5,Q6</td><td>Q9(b),
Q11(a), Q11(b)</td><td>Q13(b),
Q15(a), Q15(b)</td></tr>
<tr><td>VI</td><td>Q7,Q8</td><td>Q10(b),
Q12(a), Q12(b)</td><td>Q14(b),
Q16(a), Q16(b)</td></tr>
<tr><td>Total Questions</td><td colspan="3">8</td><td>8</td><td>8</td></tr>
</table>

MODEL QUESTION PAPER

BOARD DIPLOMA MID SEM-I SEMESTER EXAMINATIONS (C-24)

CS-402 - JAVA PROGRAMMING

Duration : 1 Hour **Maximum Marks: 20**

PART-A

Instructions: **(1) Answer all questions.** **4x1 = 4 Marks**

(2) Each question carries *one* mark.

1) List out any four keywords of java
2) Compare Java & C++
3) Define inheritance.
4) What is 'super' keyword.

PART-B **2×3=6 Marks**

Instructions: **(1) Answer *one* question each from 5 and 6**
(2)Each Question is of internal choice type
(3)Each question carries *three* marks.

5(a) Describe the java data types.

(OR)

5(b) Describe string classes and methods.

6(a) Compare class and interface.

(OR)

6(b) Briefly explain scope of variables in interfaces.

PART-C **2×5=10 Marks**

Instructions: **(1) Answer one question each from 7 and 8.**
(2)Each Question is of internal choice type
(3)Each question carries *five* marks.

7(a) Develop a java program using static and final variables.

(OR)

7(b) Explain the structure of java with an example program.

8(a) Explain the concept of interfaces with an example program.

(OR)

8(b) Develop a java program to implement multiple inheritance through interfaces.

MODEL QUESTION PAPER

BOARD DIPLOMA MID SEM-II SEMESTER EXAMINATIONS (C-24)

CS-402 - JAVA PROGRAMMING

Duration : 1 Hour **Maximum Marks: 20**

PART-A

Instructions: **(1) Answer all questions.** **4x1 = 4 Marks**

(2) Each question carries *one* mark.

1) Define package.
2) Write the syntax to import a package.
3) List AWT controls
4) Write the method of ActionListener interface

PART-B **2×3=6 Marks**

Instructions: **(1) Answer *one* question each from 5 and 6**
(2)Each Question is of internal choice type
(3)Each question carries *three* marks.

5(a) Explain the steps to create a package.

(OR)

5(b) Demonstrate life cycle an Applet.

6(a) Describe about Delegation Event Model?

(OR)

6(b) List and discuss AWT classes.

PART-C **2×5=10 Marks**

Instructions: **(1) Answer one question each from 7 and 8.**
(2)Each Question is of internal choice type
(3)Each question carries *five* marks.

7(a) Explain creating and accessing a package with an example program.

(OR)

7(b) Explain applet life cycle

8(a) Explain to handle Key events with an example program.

(OR)

8(b) Explain to handle Mouse events with an example program.

MODEL QUESTION PAPER

BOARD DIPLOMA SEMESTER END EXAMINATION (C-24)

CS-402 - JAVA PROGRAMMING

Duration : 2 Hours **Maximum Marks: 40**

PART-A

Instructions: **(1) Answer all questions.** **8x1 = 8 Marks**

(2) Each question carries *one* mark.

1) Write the syntax to declare a variable.
2) List out java API packages.
3) Define multithreading.
4) List the uses of final keyword.
5) List the types of errors.
6) Define inter thread communication.
7) Define JDBC.
8) Define Exception.

PART-B **4×3=12 Marks**

Instructions: **(1) Answer *one* question each from 9,10,11 and 12.**
(2)Each Question is of internal choice type
(3)Each question carries *three* marks.

9(a) Describe the use of command line arguments.

(OR)

9(b) Discuss about thread priorities.

10(a) Describe isAlive() and join() methods.

(OR)

10(b) List different types of JDBC drivers.

11a) What is synchronization? When do we use it?

(OR)

11(b) Demonstrate life cycle of a thread.

12(a) Discuss about Resultset.

(OR)

12(b) Write about Deadlock

PART-C **4×5=20 Marks**

Instructions: **(1) Answer one question each from 13,14, 15 and 16.**
(2)Each Question is of internal choice type
(3)Each question carries *five* marks.

13(a) Write a java program using constructor.

(OR)

13(b) Explain the process of creating thread using Runnable interface.

14(a) Write a java program to handle keyboard events.

(OR)

14(b) Develop a java application to establish a connection to database.

15(a) Explain the concept of multi-catch statements with example programs.

(OR)

15(b) Explain deadlock with an example program.

16(a) Write a java program to insert update and delete data from a database.

(OR)

16(b) Explain about Inter thread communication

CS-403 PYTHON PROGRAMMING

Course Title:	**Python programming**	Course Code	**CS-403**
Semester	**IV Semester**	Course Group	**Core**
Teaching Scheme in Periods (L:T:P)	**4:1:0**	Credits	**2.5**
Methodology	**Lecture+Tutorials**	Total Contact Periods	**75**
CIE	**60 Marks**	SEE	**40 Marks**

Pre requisites

Basic understand of computer hardware and object oriented programming.

Course Outcomes

Upon completion of the course, the student shall be able to

CO1	To learn, read and write simple Python programs.
CO2	Use data types, operators and control structures to write simple python problems
CO3	Use Functions, Strings and Data structures in python.
CO4	Develop classes, modules and packages
CO5	Develop Multithread applications and handles runtime exceptions
CO6	Process files, design GUI, database operations, regular expressions, installation of modules and packages

Course Content and Blue Print of Marks for SEE

Unit No	Unit Name	Periods	Questions to be set for SEE				
			R			U	A
I	**Introduction & Basics of Python**	15	Q4	Q1		Q9(a)	Q13(a)
II	**Conditionals and Loops**	10					
III	**Functions,Strings and Data Structures**	15		Q2		Q10(a)	Q14(a)
IV	**Classes, Modules and Packages**	10					
V	**Exception handling and Multithreading**	10		Q3	Q5,Q6	Q9(b),Q11(a), Q11(b)	Q13(b),Q15(a), Q15(b)
VI	**File**	15			Q7,Q8	Q10(b),Q12(a),	Q14(b),Q16(a),

	Processing,Design GUI, Connect to Database, regular expressionsand working with packages					Q12(b)	Q16(b)
	Total	75	8			8	8

Course Contents

UNIT1: Introduction & Basics of Python

Duration: 12 Periods (L: 10 – T:2)

Introduction:

Introduction to python programming language,versions of python,Python IDE.

Basics of Python:

Variable declaration and initialization,comments,Indentation,Expressions,Assignment Statement, Arithmetic Operators, Operator Precedence, Boolean Expression, Interacting with Python Programs.

UNIT2: Conditionals and Loops

Duration: 13 Periods(L:10 – T:3)

Conditionals: Conditional statement in Python (if-else statement, its working and execution), Nested-if statement and Elif statement in Python, Expression Evaluation & Float Representation.

Loops: Purpose and working of loops,while loop including its working, For Loop, Nested Loops, Break and Continue

UNIT3: Functions,Strings and Data Structures

Duration: 15 Periods(L:13 – T:2)

Functions: Parts of A Function, Defining & Calling a function, passing arguments to functions– Mutable & Immutable Data Types, Different types of arguments, Recursion, Scope of variables

Strings: Length of the string and perform Concatenation and Repeat operations in it. Indexing and Slicing of Strings.

Python Data Structure: Tuples, Lists, Sets, Dictionaries

UNIT4: Classes and Packages

Duration: 10 Periods (L:8– T:2)

Define Class- data member, methods, and constructors and create an instance of class- different types of Inheritance- Python Identity Operator- Creating and importing **Modules** and **Packages-** scope of variables-virtual environment for python application- Installing packages- math and datetime package

UNIT5: Exception handling and Multithreading

Duration: 10 Periods(L:8– T:2)

Different Types of errors- Exception handling- Multithreading- ways of creating threads - Methods in the Thread module -Thread Synchronization

UNIT6: File Processing,Design GUI, Connect to Database, Regular expressions, and working with packages

Duration: 15 Periods(L:12 – T:3)

Working with files and folders,working with database and connectivity, Design a graphical interface-Discuss Geometry Managers-Regular expressions - Familiarize with package installation and functions of numpy,pandas,matplotlib,sklearn.

Reference Books

1. James Payne, Beginning Python using Python 2.6 and Python 3, Wrox publishing
2. Paul Gries, Practical Programming: An Introduction to Computer Science using python 3,The Pragmatic Bookshelf, 2nd edition (4 Oct. 2013)
3. Charles Dierach, Introduction to Computer Science using Python
4. Introduction to Computation and Programming Using Python. John V. Guttag, theMIT Press.
5. Raspberry Pi Cookbook 2014 by Simon Monk
6. Core Python Programming 2018 by R. Nageswara Rao
7. Python: For Beginners: by Timothy C. Needham
8. Sams Teach Yourself Python Programming for Raspberry Pi in 24 Hours Second Edition, Sams publication by Christine Bresnahan, Richard Blum
9. Python Programming Fundamentals- A Beginner's Handbook 2018 by NischaykumarHegde.

Suggested E-learning references

1. https://www.python.org/about/gettingstarted/
2. https://www.w3schools.com/python/
3. https://www.programiz.com/python-programming
4. https://www.tutorialspoint.com/python/index.htm
5. https://realpython.com/start-here/
6. https://www.codecademy.com/learn/learn-python
7. https://www.dataquest.io/blog/learn-python-the-right-way/

Suggested Learning Outcomes

For Achieving the Course outcomes, the following learning outcomes must be achieved.

CO1: To learn, read and write simple Python programs

1.1 Familiarize to python programming language
1.2 List different versions of pythons
1.3 Compare Python programming language with Java Programming language
1.4 Lists features of Python programming.
1.5 Sets the execution environment for Python.
1.6 Execute Python Script (Command Prompt, Script and IDE) in different ways
1.7 Declare and initialize variables
1.8 Use Comments, Indentation in programs
1.9 Discuss Data Types Booleans, Numbers
1.10 Assignment and arithematic Operators, Operator Precedence

CO2: **Use data types, operators and control structures to write simple python problems**

2.1 Use Decision Making Statements to solve different problems.
2.2 Discuss about if-else statement, its working and execution
2.3 Define Nested-if statement and execution.
2.4 Define Elif statement and its execution
2.5 Expression Evaluation & Float Representation.
2.6 List Various Loop Statements with example to solve problems which are iterative
2.7 While loop and its working
2.8 For loop and its working
2.9 Nested loop and its working
2.10 Break and continue statements.

CO3:Use Functions, Strings and Data structures in python

3.1 Parts of a Function

3.2 Defining & Calling a function

3.3 Passing arguments to functions

3.4 List different types of arguments

3.5 Discuss about Mutable & Immutable Data Types

3.6 DemonstrateRecursion(Solve problems by using recursive method of problem solving)

3.7 Scope of variables

3.8 Process strings using operators and built-in functions

3.9 Explain Indexing and Slicing of Strings.

3.10 Perform operation on Lists, Tuples, Sets, and Dictionaries

CO4:Develop classes, modules and packages

4.1 Define class with its members and create instances of class

4.2 Implement different types of Inheritance.

4.3 Use super to call methods of a super class

4.4 Use Python Identity Operator

4.5 Create and import Modules and Packages

4.6 Use local and global variables

4.7 Sets up the virtual environment for python application

4.8 Install packages

4.9 Use datetime package in python application

4.10 Write programs using standard Mathematical function sqrt, cos, sine, pow, degrees, and fabs

CO5:Develop Multithread applications and handles runtime exceptions

5.1 Difference between compile time errors, runtime errors and logical errors

5.2 List common compile time errors and runtime errors

5.3 Using try/except, finally and else block to handle exceptions

5.4 Usage of raise statement.

5.5 Create User defined exception classes

5.6 Define Multithreading

5.7 List pros and cons of Multithreading.

5.8 Create threads using Threading module

5.9 Create Multiple Threads which perform different tasks

5.10 Design threads using, start, join, isAlive, getName, setName, activeCount and currentThread methods.

CO6:Process files, design GUI, database operations,regular expressions, installation of modules and packages

6.1 open, close, read, write, append data to files using programs
6.2 List modes of opening a file
6.3 Delete files and folders
6.4 Connect to MySql database
6.5 Perform creation of table, insert a row in a table, update an entry in a table and execute stored procedures
6.6 Store images using blob data type
6.7 Design a Graphical User Interface using TKinter library
6.8 Design GUI using different Geometry Managers
6.9 Use various Widgets in TKinter library
6.10 List attributes of widgets
6.11 Handle Events generated by various widgets
6.12 Create patterns to use regular expressions
6.13 Validate data using regular expressions
6.14 Demonstrate the installation of numpy,pandas,matplotlib,sklearn

Suggested Student Activities

Note:

1. Student activity like mini-project, quizzes, etc. should be done in group of 3-5 students.
2. Each group should do any one of the following type of activity or any other similar activity related to the course with prior approval from the course coordinator and programme coordinator concerned.
3. Each group should conduct different activity and no repetition should occur.
4. Design a simple project that automates a task
5. Study the impact of recent technologies on health and environment; prepare a report that addresses the issues and solution to them.
6. Study Recent Technologies like Data Mining, Data Analysis, and Data Scientist; and write a report that distinguishes these technologies.

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	
CO1	2	1						1
CO2	2	1						1
CO3	2	1	1	1				1,2,3,4
CO4	2	1	1					1,2,3
CO5	3	2	2				1	1,2,3,7
CO6	3	2	2				2	1,2,37

State Board of Technical Education

Python Programming (C-24)

CS-403---IV Semester

Mid SEM -I Model Paper

Time: 1 hour **Marks: 20**

PART-A

Instructions: *4*1 =4 marks*

Answer all questions

Each question carries 1 mark

1. List any two operators in python
2. List the features of python programming language.
3. Write the purpose of Indentation.
4. Write the syntax to declare Dictionary.

NOTE: 1. Answer any one question from 5 and 6. *2*3=6 marks*

2. Each question carries three marks.

5(a). Write about operator precedence in python

OR

5(b). Write the differences between Python and Java

6(a). Write any five string processing functions.

OR

6(b). Write the differences between implementing function using loops and recursion.

PART-C

NOTE: 1. Answer any one question from 7 and 8. *2*5=10 marks*

2. Each question carries three marks.

7(a). Explain in detail about the operators in python?

OR

7(b). Explain the different ways of executing a python program

8(a). Develop a python program to demonstrate the use of ELIF statement

OR

8(b). Develop a python program to find the next prime number of a given prime number

State Board of Technical Education
Python Programming (C-24)
CS-403---IV Semester
Mid SEM -II Model Paper

Time: 1 hour **Marks: 20**

PART-A

Instructions: *4 *1 =4 marks*

Answer all questions

Each question carries 1 mark

1. What is the user of super keyword?
2. Define module.
3. List any two data types in python?
4. Write with syntax the use of Lists in python?

PART-B

NOTE: 1. Answer any one question from 5 and 6. *2*3=6 marks*

2. Each question carries three marks.

5(a). Discuss different types of inheritance with a diagram.

OR

5(b). Write any five string functions?

6(a). Write about Tuples in python with example?

OR

6(b). Discuss about scope of variable in python?

PART-C

NOTE: 1. Answer any one question from 7 and 8. *2*5=10 marks*

2. Each question carries three marks.

7(a). Write the steps to steps to create virtual environment for python application.

OR

7(b). Write an application to create a module and import the same to other module.

8(a). Write a python program for recursive function.

OR

8(b). Write a python program to demonstrate any two inheritance concepts.

State Board of Technical Education, Telangana State

C24-Semester End Examination (SEE)

Model Paper- CS-403

(Python Programming)

Time: 2 Hours **Total Marks: 40**

PART – A

Instructions: ***8 X1 M = 08 Marks***

Answer all the following questions:

Each question carries 1 mark

1. Write the syntax to create a dictionary type variable.
2. Write the use of raise statement.
3. List any four widgets for developing a GUI.
4. Define Multithreading.
5. What is the purpose of Geometry Managers?
6. Define regular expression.
7. Write the syntax to open a file.
8. Write any two widgets tkinker standard options.

PART- B

NOTE: 1. Answer any one question from 9, 10, 11 and 12. ***MARKS: 4 X 3=12***

2. Each question carries three marks.

9(a) Explain the different ways of executing a python program

OR

9(b) Discuss search, replace and match function for regular expression.

10(a) List different types of inheritance with diagram.

OR

10(b) Write how to calculate the resistance of a resistor by using color codes.

11(a) Discuss basic attributes of widgets.

OR

11(b) Write different geometry managers.

12(a) Discuss the function to open, write and close a file.

OR

12(b) Write the process to connect MySql database.

PART-C

NOTE: 1. Answer any one question from 13, 14, 15 and 16 MARKS: 4 X 5=20

2. Each question carries five marks

13(a)Write a python program to print multiplication tables from 1 to 10.

OR

13(b)Design a window application that displays number of times a user clicks a button.

14(a)Write a python script thatdeniesaccess to multiple threads to critical section.

OR

14(b)Write a python program to delete record from a table.

15(a)Create regular expression to validate email-id, and phone number.

OR

15(b)Write a python application to handle list box events.

16(a)Write a python program to copy one file into another file and delete the original file.

OR

16(b) Write in details about various widgets option in Tkinker.

CS-404 RELATIONAL DATABASE MANAGEMENT SYSTEMS

Course Title:	Relational Database ManagementSystems	Course Code	**CS-404**
Semester	**IV Semester**	Course Group	**Core**
Teaching Scheme in Periods (L:T:P)	**4:1:0**	Credits	**2.5**
Methodology	**Lecture+Tutorials**	Total Contact Periods	**75**
CIE	**60 Marks**	SEE	**40 Marks**

Pre requisites

Knowledge of programming language.

Course Outcomes

Upon completion of the course, the student shall be able to

CO1	Outlinethecharacteristicsofdatabase,architectureandlanguagesof Databasesystem
CO2	ImplementEntity-Relationshipdiagrams, Relationship database model
CO3	ApplyNormalization techniquesforrelationaldatabasesandfamiliarizewithdatabasetransactionprocessing using SQL
CO4	Make Useof StructuredQueryLanguage(SQL),framequeries toanydatabase
CO5	Createqueriestoanydatabase,managingschemaobjectsand familiarize withPL/SQL
CO6	DevelopprogramsusingPL/SQL

Course Content and Blue Print of Marks for SEE

Unit No	Unit Name	Periods	Questions to be set for SEE			
				R	U	A
I	ConceptsofDatabases	10	Q 4	Q1	Q9(a)	Q13(a)
II	Data modelling using the Entity Relationship(ER) Model, Relational data model.	10				
III	Normalization for relational databases,, Data Base Transaction Processing, Concepts of SQL	15		Q2	Q10(a)	Q14(a)
IV	SQL functions,SQL Sub queries,Joins	10				

V	Managementofschema objectsandConceptofPL/SQL	15		Q3	Q5,Q6	Q9(b),Q11(a), Q11(b)	Q13(b),Q15(a), Q15(b)
VI	Advanced PL/SQL	15			Q7,Q8	Q10(b),Q12(a), Q12(b)	Q14(b),Q16(a), Q16(b)
	Total	75	8			8	8

Course Contents

UNIT-1:ConceptsofDatabase. Duration:10Periods(L: 8– T: 2)

Introduction - Characteristics of the database –Database System Concepts -Applications - Data Models – Schemas and Instances - Three-Schema Architecture and Data Independence - Database Languages and Interfaces - TheDatabase System Environment - Centralized and Client /Server Architectures for DBMSs -ClassificationofdatabaseManagement System.

UNIT-2 DataModelingUsingtheEntity-Relationship(ER)Model,Relational data Model. Duration:10Periods (L: 8– T: 2)

Using High Level Conceptual Data Models for Database Design-An example DatabaseApplication - Entity Types - Entity Sets - attributes and keys - Relation Types - RelationshipSets - roles and structural constraints - ER Diagrams, naming conventions - .Relational Model concepts - Relational Model Constraints and relational database schemas - Update operation and Dealing with constraints violations.

UNIT-3 Normalization for relationaldatabases, DataBaseTransaction Processing,ConceptsofSQL. Duration:15Periods (L: 12– T: 3)

Functional dependencies - Normal forms based on primary keys - GeneralDefinition of first, second and third normal forms, Boyce-Codd Normal form - Introduction totransactionprocessing-transactionandsystemconcepts-desirablepropertiesoftransactions– Serializability-StatesofTransactions.Familiarize with SQL - pseudo columns - Data Definition and data types – DDL statementsin SQL - DML statements in SQL –TCL statements in SQL-DCL statements

UNIT-4 SQL functions-Sub queries,Joins. Duration: 10 Periods(L: 8– T: 2)

Queries in SQL - various operators in SQL-specifyingconstraints inSQL-various functions in SQL.SQL subqueriesandJOINstatements.

UNIT-5 Managementofschema objectsandConceptsofPL/SQL

Duration: 15 Periods(L: 12– T: 3)

ManagementofSchemaobjects—indexes–sequences - synonyms – views- PL/SQL Introduction - Data types- Naming Conventions –controlstatements-sequential control GOTOandNULLstatements

UNIT-6Advanced PL/SQL **Duration: 15 Periods(L: 12– T: 3)**

Records - Subprograms–Functions–Stored Procedures-RETURN statement– Recursion-Exceptions– Cursors-Triggers – Packages.

Text Books

1. "FundamentalsofDatabaseSystems"Sixthedition,2014,RamezElmasri,Shamkan B.Navathe,Pearson Education,ISBN-9788131792476.
2. Fundamentals of Database System ByElmasari&Navathe- Pearson Education

Reference Books

1. "An IntroductiontoDatabaseSystems"8th editionbyCJDate.
2. "DATABASE SYSTEM CONCEPTS" 6th edition by Abraham SilberschatzYaleUniversity,Henry F.KorthLehighUniversity,S.SudarshanIndianInstitute ofTechnology,Bombay.
3. "Database Management Systems" Raghu Ramakrishna and Johannes Gehrke-3rdEdition,McGraw-Hill, 2003.
4. "DBMSapracticalapproach"byERRajiv Chopra,SChandpublications.
5. "Database Systems: Design, Implementation, and Management", Eighth Edition byPeterRob and Carlos Coronel.
6. "DatabaseSystemsAPracticalApproachtoDesign,Implementation,andManagement" 6thedition ByThomas Connolly,CarolynBegg.

Suggested e-Learning Links

1. https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm
2. https://www.w3schools.com/sql
3. https://www.tutorialspoint.com/dbms
4. https://beginner-sql-tutorial.com/sql.htm.
5. https://www.w3schools.com/sql/sql_join.asp
6. https://www.tutorialspoint.com/plsql/index.htm

Suggested e-moduleLink

1. https://www.youtube.com/watch?v=4Z9KEBexzcM
2. https://www.youtube.com/watch?v=iY0akm4ejAY

Suggested Learning Outcomes

For Achieving the Course outcomes, the following learning outcomes must be achieved.

CO1: Outlinethecharacteristicsofdatabase,architectureandlanguagesof Databasesystem

1.1 Illustrate Database& itscharacteristics.
1.2 List theapplicationsofDBMS.
1.3 ExplaindifferenttypesofDataModels.
1.4 DefineSchemas,instances.
1.5 Define Database abstraction.
1.6 Define DataIndependence.
1.7 Explain Three-SchemaArchitecture.
1.8 FamiliarizeDatabaseLanguagesandInterfaces.
1.9 Outline DatabaseSystemEnvironment.
1.10 ExplainCentralizedandClient/ServerArchitecturesforDBMSs.
1.11 ClassifydifferenttypesofDatabaseManagementSystem.

CO2: ImplementEntity-Relationshipdiagrams, Relationship database model

2.1 Explain howtouse High-LevelConceptualDataModelsfor DatabaseDesign.
2.2 DefineEntityTypes.
2.3 Compare Weak Entity and Strong Entity.
2.4 Illustrateattributesandkeys.
2.5 Illustrate Relationship types and Relationship sets.
2.6 Define the terms Super key, Candidate key and Primary key.
2.7 Explainrolesandstructuralconstraints.
2.8 Make use of naming conventions and Develop ER diagrams
2.9 UseRelationalModelconcepts.
2.10Outline Relational model Constraints.
2.11Illustrate Relationaldatabaseschema.
2.12 Analyze Update operation and Dealing with Constraints violations.

CO3:**ApplyNormalization techniquesforrelationaldatabasesandfamiliarizewithdatabasetransaction processing using SQL**

3.1 DefineFunctionaldependencies and its types.
3.2 ListNormalformsbasedonprimarykeys.

3.3 ExplainGeneralDefinitionoffirst,secondandthirdnormalforms,Boyce-CoddNormalformwith examples.

3.4 Analyze Transactions and its States.

3.5 Illustrate the ACID Properties of Transactions.

3.6 Explain Serializability and its types.

3.7 List SQLFeatures and benefits.

3.8 Explain different data types like character, number long, date, raw and long raw etc.

3.9 Demonstrate DataDefinition Language statements in SQL.

3.10Construct queries using Data modification Language statements in SQL.

3.11Illustrate Commit, Rollback and Save point.

3.12 Explain Data control language Statements in SQL.

CO4: Make Use of StructuredQueryLanguage(SQL),framequeries toanydatabase

4.1 List Pseudo columns in SQL.

4.2 Listvarious operators in SQL.

4.3 Understand theprocessofspecifyingconstraints inSQL.

4.4 ExplaindifferentcategoriesofSQLfunctionslikenumericfunctions,aggregatefunctions,scalar functions, datefunctions and stringfunctionsin SQL.

4.5 Define Sub queries.

4.6 Demonstratetypes of Sub queries With Examples.

4.7 Define JOINstatement.

4.8 Illustrate types of JOIN Statements in SQL.

4.9 Compare CROSS JOIN and UNION.

CO5: Createqueriestoanydatabase,managingschemaobjectsand familiarize WithPL/SQL

5.1 Explainthemanagementofschemaobjects.

5.2 Outline the stepsfor managingindexes.

5.3 Demonstrate Sequences with examples.

5.4 ExplainthevariousSynonymsmanagementlikecreating,droppingetc.

5.5 Explainviewsandillustratethecreation ofviewsfrommultipletables.

5.6 Familiarize with PL/SQL.

5.7 ListvariousdatatypesinPL/SQL

5.8 Analyzevarious controlstatements in PL/SQLwith examples.

5.9 Listsequential control GOTOand NULLstatements

CO6: DevelopprogramsusingPL/SQL

6.1 FamiliarizewithPL/SQLrecords.

6.2 Definesubprograms.

6.3 DevelopPL/SQLprogramsusingfunctions.

6.4 Develop Pl/SQL programs using stored procedures.

6.5 Illustrate Recursion using PL/SQL

6.6 DevelopPL/SQLprogramstohandleexceptions.

6.7 DefineCursor.

6.8 Explain different types of Cursorswithexamples.

6.9 DefineTriggersandexplainTriggerswithexamples.

6.10List advantages of Packages.

6.11 Explain Packages with examples.

Suggested Student Activities

Student activity like mini-project, surveys, quizzes, etc. should be done in group of 3-5 students.

- Each group should do any one of the following type activity or any other similar activity related to the course and before conduction, get it approved from concerned course coordinator and programme co-coordinator.
- Each group should conduct different activity and no repeating should occur.

1. Visit Library to refer to standard Books on Database Management Systems, collect related material and prepare notes.
2. Refer to online content and videos to get more knowledge on database concepts.
3. Study different types of databases in the industries and prepare a Power Point Presentation (PPT).
4. Write assignments given by course coordinator.
5. Read all the course contents and should be able to write slip tests and surprise tests.
6. Prepare a seminar on a specific topic that is related to latest technologies in the database field and present to all the peers.
7. Design a simple project using any one database.
8. Study IEEE papers on Big data, Data science, Data Mining topics and submit a report.
9. Prepare quiz on database related questions and conduct.
10. Participate in state level or national level technical conferences.

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO 7**	**PO**
CO1	2	-	-	-	-	-	1	1,7
CO2	2	1	1	-	-	-	1	1,2,3,7
CO3	3	1	1	1	-	-	2	1,2,3,4,7
CO4	2	2	2	2	-	2	**2**	1,2,3,4,6,7
CO5	3	2	2	2	-	2	2	1,2,3,4,6,7
CO6	2	2	2	2	-	2	2	1,2,3,4,6,7

MODELQUESTIONPAPER
BOARD DIPLOMA MID-SEMESTER-I EXAMINATION (C-24)

CS-404 – RELATIONAL DATABASE MANAGEMENT SYSTEMS

TIME:1HOUR **MAXIMUMMARKS:20**

PART A ***MARKS :4x1=4***

NOTE:1.Answerallquestions.

2. Each questioncarries onemark.

1. DefineDBMSandlist3applicationsofDBMS
2. DefineDataIndependence.
3. Listsomestructuralconstraints.
4. DefineWeakentitytypes.

PART-B ***MARKS: 2 X 3=6***

NOTE:**1. Answer anyonequestionfrom5and 6.**

2. Each questioncarriesthreemarks.

5. (A)write a short notesThree-SchemaArchitecture.

   or

   (B) ListsomeDatabase Models.

6. (A)HowtouseHigh-LevelConceptualDataModelsfor DatabaseDesign.

   Or

   (B) Listdifferenttypesofattributesandkeys.

PART-C ***MARKS: 2 X 5=10***

NOTE:1. Answer anyonequestionfrom7and 8.

2.Eachquestioncarriesfivemarks.

7. (A)Listandexplain,DatabaseLanguagesand Interfaces

   or

   (B) ExplaintheCentralizedandClient/ServerArchitecturesforDBMSs.

8. (A)Explain Update operation and Dealing with Constraints violations

   or

   (B) DemonstrateERDiagram forUniversitywitha neatsketch

MODELQUESTIONPAPER
BOARD DIPLOMA MID-SEMESTER-II EXAMINATION (C-24)

CS-404 –RELATIONAL DATABASE MANAGEMENT SYSTEMS

TIME:1HOUR **MAXIMUMMARKS:20**

PART A ***MARKS :4x1=4***

NOTE:1.Answerallquestions.

2.Each questioncarries onemark.

1. Listsomerelationalmodelconcepts.
2. List Normal forms.
3. ListthebenefitsofSQL.
4. WritethesyntaxtocreateatableinSQL.

PART-B ***MARKS: 2 X 3=6***

NOTE:**1. Answer anyonequestionfrom5and 6.**

2. Each questioncarriesthreemarks.

5. (A)Write short notes Data Definition Language.

   or

   (B)ListtheACIDPropertiesofTransactions.

6. (A)ListPseudo columns.

   or

   (B)Write a short notes on Sub Queries.

PART-C ***MARKS: 2 X 5=10***

NOTE:1. Answer anyonequestionfrom7and 8.

2.Eachquestioncarriesfivemarks.

7. (A)ExplainSerializabilitywithexamples.

   Or

   (B)IllustrateCommit,Rollback,andSavePoint.

8. (A) Explain the process of specifying constraints in SQL.

   Or

   (B)Implementtheaggregatefunctionsandstringfunctionsin SQL.

MODEL QUESTION PAPER
BOARD DIPLOMA SEMESTER END EXAMINATION (C-24)
CS-404 – RELATIONAL DATABASE MANAGEMENT SYSTEMS

TIME: 2 HOURS MAXIMUM MARKS: 40

PART-A MARKS: 8 X 1=8

NOTE: 1. Answer all questions.
2. Each question carries one mark.

1. Define Schemas, instances.
2. Define Conflict Serializability.
3. Define Cursors.
4. List Pseudo Columns.
5. List Various Data types in PL/SQL.
6. Write the syntax to create a table in SQL.
7. List the types of subprograms in PL/SQL.
8. Define Triggers.

PART-B

NOTE: 1. Answer any one question from 9, 10, 11 and 12. MARKS: 4 X 3=12

2. Each question carries three marks.

9. (A) List different types of data models.
   Or
   (B) List control statements in PL/ SQL.

10. (A) List types of Functional dependencies.
    Or
    (B) Write short notes on PL/SQL records.

11. (A) List the types of schema objects.
    Or
    (B) Write short notes on sequential control statements.

12. (A) Write the syntax for stored procedures.
    Or
    (B) Write the syntax for Functions

PART-C

NOTE: 1. Answer any one question from 13, 14, 15 and 16 MARKS: 4 X 5=20

2. Each question carries five marks.

13. (A) List and explain Relation types.

or

(B) Illustrate the creation of sequences with examples.

14. (A) Implement different types of Normal Forms with examples.

or

(B) Develop PL/SQL program using recursive functions.

15. (A) Explain the procedure for managing indexes.

or

(B) Illustrate the creation of views from multiple tables with examples.

16. (A) Develop the concept of handling exceptions in PL/SQL with example program.

or

(B) Develop a PL/SQL program using Packages.

CS-405 CRYPTOGRAPHY & NETWORK SECURITY

Course Title:	**Cryptography & Network Security**	Course Code	**CS-405**
Semester	**IV Semester**	Course Group	**Core**
Teaching Scheme in Periods (L:T:P)	**4:1:0**	Credits	**2.5**
Methodology	**Lecture+Tutorials**	Total Contact Periods	**75**
CIE	**60 Marks**	SEE	**40 Marks**

Pre requisites

Basic Knowledge of intermediate level mathematics and computer networking concepts

Course Outcomes

Upon completion of the course, the student shall be able to

CO1	Describe Cryptography, Identify various threats and understand network security model
CO2	Apply the encryption techniques to generate encrypted messages for a given plain text
CO3	Verify the authenticity of received cipher text
CO4	Differentiate internet security and web security
CO5	Classify malicious software's, virus, worm and countermeasures
CO6	Realize the importance of firewall, cybercrime and digital rights management

Course Content and Blue Print of Marks for SEE

<table>
<tr><th rowspan="2">Unit No</th><th rowspan="2">Unit Name</th><th rowspan="2">Periods</th><th colspan="4">Questions to be set for SEE</th></tr>
<tr><th colspan="2">R</th><th>U</th><th>A</th></tr>
<tr><td>I</td><td>Introduction to Cryptography</td><td>10</td><td rowspan="6">Q4</td><td colspan="2" rowspan="2">Q1</td><td rowspan="2">Q9(a)</td><td rowspan="2">Q13(a)</td></tr>
<tr><td>II</td><td>Classical Encryption Techniques</td><td>14</td></tr>
<tr><td>III</td><td>Cryptographic Integrity Techniques</td><td>12</td><td colspan="2" rowspan="2">Q2</td><td rowspan="2">Q10(a)</td><td rowspan="2">Q14(a)</td></tr>
<tr><td>IV</td><td>Cryptographic Integrity Techniques</td><td>12</td></tr>
<tr><td>V</td><td>System Security</td><td>15</td><td rowspan="2">Q3</td><td>Q5,Q6</td><td>Q9(b),Q11(a), Q11(b)</td><td>Q13(b),Q15(a), Q15(b)</td></tr>
<tr><td>VI</td><td>Firewalls and Ethical Issue</td><td>12</td><td>Q7,Q8</td><td>Q10(b),Q12(a), Q12(b)</td><td>Q14(b),Q16(a), Q16(b)</td></tr>
<tr><td></td><td>Total</td><td>75</td><td colspan="2">8</td><td>8</td><td>8</td></tr>
</table>

Course Contents

UNIT - 1: Introduction to Cryptography Duration: 10 Periods(L: 8 – T: 2)

Security-Need of Network security- security goals, cryptography and its evolution-classic vs. modern cryptography-Attacks-Mechanisms and Services-The OSI Security Architecture: Security Services- Availability Services-Security Mechanisms and Security Attacks-A model for Network Security.

UNIT - 2: Classical Encryption Techniques Duration: 14 Periods (L: 11 – T: 3)

Encryption-Decryption-Cryptanalysis,-Cryptology-Symmetric Cipher Model-Substitution Techniques: Caesar Cipher-Monoalphabetic Cipher- Playfair Cipher-Hill Cipher-Monoalphabetic Cipher-Polyalphabetic Cipher-One Time Pad-Transposition Techniques: Rail Fence Cipher-Route Cipher-Columnar transposition-Double transposition-Myszkowski transposition-Steganography-Types of Steganography:Image-Text-Audio-Video Steganography.

UNIT - 3: Cryptographic Integrity Techniques Duration: 12 Periods (L: 9 – T: 3)

Principles of Public Key Cryptosystems-Authentication Requirements-Authentication Functions-Message Authentication Codes-Hash Functions-Digital Signatures.

UNIT – 4: Network and Internet Security Duration: 12 Periods (L: 10 – T: 2)

Web Security –Threats on Web-Approaches to Web Security-HTTPS-Wireless Security-Threats-Email Security-threats-Internet Protocol Security (IPSec)-Benefits and services.

UNIT - 5: System Security Duration: 15 Periods (L: 12 – T: 3)

Intruders-Intrusion Detection-Password Management-Backdoor-Logic Bomb-Trojan Horses-Mobile Code- and Multiple-Threat Malware-Viruses: The Nature of Viruses-Viruses Classification-Virus Kits- Macro Viruses-E-Mail Viruses-Virus Countermeasures: Antivirus Approaches-Advanced Antivirus Techniques-Worms- Difference between virus and worm-The Morris Worm--Recent Worm Attacks-State of Worm Technology-Mobile Phone Worms- Worm Countermeasures-back-up and data recovery.

UNIT - 6: Firewalls and Ethical Issues Duration: 12 Periods (L: 10 – T: 2)

The Need for Firewalls-Firewall Characteristics-Types of Firewalls and their advantages-Legal and Ethical issues-Cybercrime and Computer Crime-Ethical Issues Related to Computers and Information Systems-Digital Rights Management(DRM)-Categories of users of Digital Rights Management Systems

Text Books

1. Cryptography and Network Security: Principles and Practices, - William Stallings - Pearson Education.
2. Cryptography and Network Security –AtulKahate : McGraw Hill
3. Cryptography and Network Security: Demystifying the ideas of Network Security, Cryptographic Algorithms, Wireless Security, IP Security, System Security, and Email Security-Bhusan Trivedi, Savita Gandhi, DhirenPandit—BPB Publications
4. **Cryptography and Network Security-Achary, Rathnakar-New Age International (P) Ltd., Publishers**

Reference Books

1. Network Security Essentials (Applications and Standards) - William Stallings, Pearson Education.
2. Cryptography and Network Security: 2nd Edition - Behrouz a. Forouzan.
3. Fundamentals of Network Security—Eric Maiwald-Dreamtech Press.
4. computer networking a top-down approach- James F. kurose& Keith W. Ross, Pearson Education

Suggested e-Learning Links

1. http://www.cse.iitm.ac.in/~chester/courses/16e_cns/slides/01_Introduction.pdf
2. https://www.ijcsmc.com/docs/papers/January2015/V4I1201544.pdf
3. https://flylib.com/books/en/3.190.1.158/1/
4. https://cgi.csc.liv.ac.uk/~alexei/COMP522_10/COMP522-SecurityArchitecture_07.pdf
5. https://www.sciencedirect.com/science/article/pii/B9781597494724000019
6. https://archive.nptel.ac.in/courses/106/105/106105162/
7. http://digimat.in/nptel/courses/video/106105031/L01.html

Suggested Learning Outcomes

For achieving the Course outcomes, the following learning outcomes must be achieved

CO1: Describe Cryptography, Identify various threats and understand network security model

1.1 Define security and network security.

1.2 Describe OSI security architecture.

1.3 Discuss about different security goals.

1.4 Define Cryptography.

1.5 Differentiate classic cryptography and modern cryptography

1.6 Define Cryptanalysis

1.7 Define Cryptology

1.8 Discuss about crypto system.

1.9 Discuss about authentication, Confidentiality, integrity w.r.t data.

1.10 Compare passive and active security threats.

1.11 List and explain categories of passive and active security attacks.

1.12 List and explain categories of security services.

1.13 List and explain categories of security mechanisms.

1.14 Draw the Model for network security and explain.

CO2: Apply the encryption techniques to generate encrypted messages for a given plain text

2.1 Define encryption and decryption

2.2 Define cryptanalysis and cryptology

2.3 List the essential ingredients of a symmetric cipher.

2.4 Describe two basic functions used in encryption algorithms.

2.5 List keys required for two people to communicate via a cipher.

2.6 Classify the general approaches to attacking a cipher.

2.7 Define substitution cipher

- 2.7.1 Explain the Caesar cipher.
- 2.7.2 Elaborate the monoalphabetic cipher.
- 2.7.3 Explain Playfair cipher.
- 2.7.4 Discuss Explain Hill cipher.
- 2.7.5 Explain One-Time-Pad.
- 2.7.6 What are the problems with the one-time pad?
- 2.7.7 Differentiate mono and polyalphabetic ciphers.

2.8 Define a transposition cipher.

- 2.8.1 IllustrateRail Fence Cipher
- 2.8.2 ExplainRoute Cipher
- 2.8.3 Discuss Columnar transposition
- 2.8.4 Explain Double transposition
- 2.8.5 Illustrate Myskowski transposition

2.9 Define steganography.

- 2.9.1 Explain text, image, audio and video steganography

2.10 Compare Steganography and Cryptography

2.11 Exercise all the ciphers with examples.

CO3: Verify the authenticity of received cipher text

3.1 List the principal elements of a public-key cryptosystem.

3.2 List the roles of the public and private key.

3.3 Define hash function and cryptographic hash function.

3.4 Explain the features and properties of hash functions.

3.5 Define message digest.

3.6 Explain the applications of cryptographic hash functions in Message Authentication.

3.7 List and explain message authentication requirements.

3.8 List the message authentication functions.

3.9 Explain the message authentication code.

3.10 Define digital signature.

3.11 List the properties of a digital signature should have.

3.12 List the digital signature requirements.

CO4: Differentiate internet security and web security

4.1 Define Web Security.

4.2 Compare types of security threats on web.

4.3 Explain briefly web traffic security approaches.

4.4 Explain HTTPS.

4.5 Define Wireless Security.

4.6 List and explain security threats to wireless networks.

4.7 Classify email security threats.

4.8 List and explain various protocols used to counter email threats.

4.9 Define Internet Protocol Security (IPSec).

4.10 Explain the benefits of IPSec.

4.11 List out the IPSec services.

CO5: Classify malicious softwares, virus, worm and countermeasures

5.1 Discuss Intruders, intrusion detection, password management.

5.2 Classify malicious softwares like Backdoor, Logic Bomb, Trojan Horses, Mobile Code, and Multiple-Threat Malware.

5.3 Define virus and worm.

5.4 Discuss Virus, Virus Nature, Virus Classification, Macro Viruses, Virus Kits, E-Mail Viruses.

5.5 Discuss Virus Countermeasures: Antivirus Approaches, Advanced Antivirus Techniques.

5.6 Explain Morries worm, worm attacks, worm technologies, mobile phone worms.

5.7 Discuss worm Countermeasures.

CO6: Realize the importance of firewall, cybercrime and digital rights management

6.1 Define Firewall.

6.2 List types of firewalls.

6.3 Discuss firewall characteristics.

6.4 Analyze the importance of firewall.

6.5 Explain the steps to design a firewall.

6.5 Discuss cybercrime and computer crime.

6.6 Discuss the classification of computer crime based on the role that the computer plays in the criminal activity.

6.7 Explain digital rights management.

6.8 List the basic conditions that must be fulfilled to claim a copyright.

6.9 Describe the principal categories of users of digital rights management systems.

Suggested Student Activities

1. Student visits Library to refer Standard Books on Cryptography and Network Security and collect related material.
2. Assignments
3. Explore and analyze topics to improve the level of creativity and analytical skill by taking Quiz Programmes. Documents have to be maintained as a record.
4. Surprise tests
5. Create a power point presentation on the topic relevant to course or advanced topic as an extension to the course to improve the communication skills. Documents have to be maintained as a record.

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO 7**	**PO**
CO1	1	1					1	1,2,7
CO2	2	2	2	1	1	3	1	1,2,3,4,5,6,7
CO3	2	1	1		1	2	1	1,2,3,5,6,7
CO4	2	1	1		1		1	1,2,3,5,7
CO5	1	1	1				1	1,2,3,7
CO6	2	1	1				1	1,2,3,7

MODEL QUESTION PAPER
BOARD DIPLOMA MID SEM-I SEMESTER EXAMINATIONS (C-24)
DCME– IV-SEMESTER
CS-405- CRYPTOGRAPHY AND NETWORK SECURITY

Duration: 1 Hour **Maximum Marks: 20**

PART-A

Instructions: **(1) Answer all questions.** **4x1 = 4 Marks**
(2) Each question carries one mark.

1) Define cryptography.
2) Define network security.
3) List the essential ingredients of a symmetric cipher.
4) Define substitution cipher

PART-B **2×3=6 Marks**

Instructions: **(1) Answer onequestion each from 5 and 6**
(2)Each Question is of internal choice type
(3)Each question carries Three marks.

5(a) Discuss crypto system.

(OR)

5(b) Discuss passive threats.

6(a) Write about two basic functions used in encryption algorithms.

(OR)

6(b) Differentiate mono and polyalphabetic ciphers

PART-C **2×5=10 Marks**

Instructions: **(1) Answer one question each from 7 and 8.**
(2)Each Question is of internal choice type
(3)Each question carries Five marks.

7(a) Explain categories of passive and active security attacks.

(OR)

7(b) Draw the Model for network security and explain.

8(a) Explain Play fair cipher with the keyword "DECRYPTION" to encrypt the message " I WANT MORE MONEY"

(OR)

8(b) Explain one-time pad with an example.

MODEL QUESTION PAPER
BOARD DIPLOMA MID SEM-II SEMESTER EXAMINATIONS (C-24)
DCME– IV-SEMESTER
CS-405- CRYPTOGRAPHY AND NETWORK SECURITY

Duration: 1 Hour **Maximum Marks: 20**

PART-A

Instructions: **(1) Answer all questions.** **4x1 = 4 Marks**
(2) Each question carries one mark.

1) Define cryptographic hash function
2) Define message digest
3) Define web security.
4) Define wireless security.

PART-B

2×3=6 Marks

Instructions: **(1) Answer onequestion each from 5 and 6**
(2)Each Question is of internal choice type
(3)Each question carries three marks.

5(a) Discuss the principal elements of a public-key cryptosystem

(OR)

5(b) Explain the features and properties of hash functions

6(a) Compare types of security threats on web

(OR)

6(b) Classify email security threats

PART-C

2×5=10 Marks

Instructions: **(1) Answer one question each from 7 and 8**
(2)Each Question is of internal choice type
(3)Each question carries Five marks.

7(a) Explain the message authentication code

(OR)

7(b) Discuss briefly the message authentication requirements

8(a) Explain the benefits of Internet Protocol Security.

(OR)

8(b) List and explain security threats to wireless networks

MODEL QUESTION PAPER
BOARD DIPLOMA SEMESTER END EXAMINATION (C-24)
DCME- IV-SEMESTER
CS-405- CRYPTOGRAPHY AND NETWORK SECURITY

Duration: 2 Hours **Maximum Marks: 40**

PART-A

Instructions: **(1) Answer all questions.** **8x1 = 8 Marks**
(2) Each question carries one mark.

1) Define cryptography.
2) Define message digest
3) Define virus.
4) What is a digital signature?
5) List types of intruders.
6) What is a spyware?
7) What is a firewall?
8) List types of firewall.

PART-B 4×3=12 Marks

Instructions: **(1) Answer *one* question each from 9, 10, 11 and 12.**
(2)Each Question is of internal choice type
(3)Each question carries three marks.

9(a) Discuss passive threats.

(OR)

9(b) Discuss any three techniques for learning passwords.

10(a) Explain the benefits of Internet Protocol Security.

(OR)

10(b) Write about the characteristics of a firewall.

11a) Discuss the types of intruders

(OR)

11(b) Write short notes on (a) multi-threat malware (b) mobile code

12(a) Explain the steps to design a firewall

(OR)

12(b) Discuss cyber-crime.

PART-C **4×5=20 Marks**

Instructions: **(1) Answer one question each from 13,14, 15 and 16.**
(2)Each Question is of internal choice type
(3)Each question carries Five marks.

13(a) Encrypt the message "PAY MORE MONEY" using Hill Cipher with the encryption key matrix
$\begin{pmatrix} 6 & 24 & 1 \\ 13 & 16 & 10 \\ 20 & 17 & 15 \end{pmatrix}$. Show the calculations and result.

(OR)

13(b) Explain how a worm propagates.

14(a) Explain the message authentication code.

(OR)

14(b) Explain digital rights management

15(a) Explain (a) Backdoor (b) Trojan Horse (c) Logic bomb (d) Zombie

(OR)

15(b) Discuss in detail about worm technologies.

16(a) Explain the types of firewalls.

(OR)

16(b) Describe the principal categories of users of digital rights management systems.

CS-406 OPERATING SYSTEM

Course Title:	**Operating Systems**	Course Code	**CS-406**
Semester	**IV Semester**	Course Group	**Core**
Teaching Scheme in Periods (L:T:P)	**4:1:0**	Credits	**2.5**
Methodology	**Lecture+Tutorials**	Total Contact Periods	**75**
CIE	**60 Marks**	SEE	**40 Marks**

Pre requisites

Basic knowledge of computer and windows operatingsystem.

Course Outcomes

Upon completion of the course, the student shall be able to

CO1	Illustrate operating system functions, operations and structures.
CO2	Examine process with various process scheduling algorithms.
CO3	Recognize Synchronization and handle the deadlocks with various deadlock Management techniques.
CO4	Analyze the memory management techniques.
CO5	Implement the concept of virtualization of memory.
CO6	Illustrate Disk scheduling and Handle files using file Management techniques.

Course Content and Blue Print of Marks for SEE

Unit No	Unit Name	Periods	Questions to be set for SEE			
			R		U	A
I	**Introduction to operating systems**	10	Q4	Q1	Q9(a)	Q13(a)
II	**Process management**	15				
III	**Synchronization and Deadlocks**	12		Q2	Q10(a)	Q14(a)
IV	**Memory management**	12				
V	**Virtual memory management**	11	Q3	Q5,Q6	Q9(b),Q11(a), Q11(b)	Q13(b),Q15(a), Q15(b)
VI	**Disk Scheduling and File management**	15		Q7,Q8	Q10(b),Q12(a), Q12(b)	Q14(b),Q16(a), Q16(b)
	Total	75	8		8	8

Course Contents

UNIT - 1: Introduction to operating systems Duration: 10 Periods (L: 08 – T:2)

Operating System –Evolution of operating system-Types of Operating Systems - Multi Programming and Time Sharing - Distributed and Real time Systems-Goals of Operating System - spooling and buffering - Multi processor systems-Components of Operating Systems - operating System Services - system Calls - single User and Multi user operating System Structure.

UNIT - 2: Process management Duration: 15 Periods (L: 12 – T: 3)

Process-Sequential Process-Process State Diagram- Process Control Block- Process Creation and Termination –Relations between Processes-Threads and Multi Threading-Scheduling Concepts-Schedulers - CPU scheduling criteria - scheduling algorithms.

UNIT - 3: Synchronization and Deadlocks Duration: 12 Periods (L: 10 – T: 2)

Inter Process Communications -semaphores –monitors-Deadlocks-principal of deadlock – Necessary conditions for deadlock - deadlock detection - deadlock prevention – Bankers Algorithm-deadlock avoidance.

UNIT - 4: Memory management Duration: 12 Periods (L: 10 – T: 2)

Address binding -Dynamic Loading- dynamic linking-overlays-swapping- memory allocation-fragmentation-paging-segmentation- segmentation with paging.

UNIT - 5: Virtual memory management Duration: 11 Periods (L: 08 – T:3)

Benefits of virtual memory - virtual memory techniques - demand paging – page replacements - page replacement algorithms – thrashing.

UNIT - 6: Disk Scheduling and File management Duration: 15 Periods (L: 12 – T:3)

Disk Structure -Disk performance parameters - Disk scheduling policies - Introduction to file systems - File management - File Operations - Access methods - Directory structure organization - File Protection.

Text Books

1."Operating System", William Stallings, PHI.

2. “Operating System Concepts”, Abraham Silberschatz, Professor, Greg Gagne, and Peter Baer Galvin.

3. “Modern operatingsystem”, Andrew S.Tanenbaum, Pearson education.

Reference Books

1. **"Operating Systems: A Concept-Based Approach" by D M Dhamdhere.**
2. **"Operating Systems" by Archer J Harris.**
3. **"MODERN OPERATING SYSTEMS" by Andrew S Tanenbaum.**

Suggested Learning Outcomes

For achieving the Course outcomes, the following learning outcomes must be achieved

CO1: Illustrate operating system functions, operations and structures.

1.1 Define an operating system.

1.2 Discuss history of operating system.

1.3 Distinguish spooling and buffering.

1.4 Summarize Goals of Operating systems

1.5 Explain about various types of operating systems.

1.6 Illustrate the concepts multiprogramming and timesharing.

1.7 Differentiate between distributed and real time systems.

1.8 Describe multiprocessor systems.

1.9 Understand the operating system components.

1.10 Discuss operating system services.

1.11 Define system call with an example.

1.12 List different types of system calls and explain.

1.13 Analyse single user, multi user operating system structure.

CO2: Examine process with various process scheduling algorithms.

2.1 Define process and process control block.

2.2 Understand sequential process.

2.3 Elaborate process state diagram.

2.4 Describe process creation and termination.

2.5 Understand the relation between processes.

2.6 Define Thread and describe multithreading.

2.7 Outline scheduling concepts.

2.8 Describe scheduling queues and schedulers.

2.9 Explain CPU scheduling criteria.

2.10 Explain various scheduling algorithms

- 2.10.1 FCFS
- 2.10.2 SJF
- 2.10.3 Round Robin

2.10.4 Priority

2.10.5 Multilevel Scheduling.

2.10.6 Multilevel Feedback Scheduling

CO3: Recognize Synchronization and handle the deadlocks with various dead lock Management techniques.

3.1 Explain inter process communication.

3.2 Describe semaphores

3.3 Describe Monitors

3.4 Define Deadlock.

3.5 State the necessary conditions for arising deadlocks.

3.6 State various techniques for deadlock prevention.

3.7 Discuss Deadlock avoidance and detection.

3.8 Describe Bankers Algorithm.

3.9 Describe the process of recovering from deadlock.

CO4: Analyze the memory management techniques.

4.1 Describe briefly address binding, dynamic loading, dynamic linking.

4.2 Define overlays.

4.3 Describe briefly swapping.

4.4 Explain single partition allocation.

4.5 Explain multiple partition allocation.

4.6 Analyse the concept of fragmentation.

4.7 Illustrate paging concept.

4.8 Elaborate how logical address is translated into physical address.

4.9 Explain segmentation and segmentation with paging.

CO5: Implement the concept of virtualization of memory.

5.1 Illustrate virtual memory techniques.

5.2 Understand need of virtual memory.

5.3 Importance of virtual memory.

5.4 Benefits of virtual memory.

5.5 Explain demand paging.

5.6 Describe page replacement

5.7 Analyse page replacement algorithms

5.7.1 FIFO

5.7.2 LRU

5.7.3 Optimal.

5.8 Explain the concept of thrashing.

5.9 Illustrate working set model and page fault frequency.

CO6: Illustrate Disk scheduling and Handle files using file Management techniques.

6.1 Explain Disk Structure.

6.2 List out various disk performance parameters

6.3 Disk scheduling policies

6.2.1 FCFS

6.2.2 SSTF

6.2.3 SCAN

6.2.4 C-SCAN

6.2.5 LOOK

6.4 Define file management.

6.5 List and explain various file operations.

6.6 List and explain various access methods.

6.7 Explain directory structure organization.

6.8 Understand the concept of file protection

Suggested Student Activities

Student activity like mini-project, survey, quiz, etc. should be done in group of 3-5 students.

a. Each group should do any one of the following type activity or any other similar activity related to the course and before conduction, get it approved from concerned course coordinator and program coordinator.
b. Each group should conduct different activity and no repeating should occur

Activities:

1. Installation and Un-installation of an Operating System on a New Computer
2. Removing of Second Operating System from a PC
3. A Survey of recent Operating System.
4. Case study on real time deadlock situation.
5. A case study on real time process synchronization.
6. Comparison of OS working in single core and multi core environment.
7. Documentationofcomparing32 bits and64 bits OS.
8. Operating system is responsible for following activities in connection with management of memory:

i. Allocation and de-allocation of memory as and when needed.

ii. Keeping track of used and unused memory space.

iii Deciding what process to be loaded into memory in case space becomes available

9. for secondary space management:

i. Swap space and free space management

ii. Disk scheduling

iii. Allocating space to the data and programs onto the Secondary storage device.

10. For process management:

i. Creation, deletion of both user and system process.

ii. Handling process synchronization.

iii Dead lock handling.

Suggested e-Learning Links

1. http://www.tutorialspoint.com/operating_system/
2. http://nptel.ac.in
3. https://www.geeksforgeeks.org/operatingsystems
4. https://www.studytonight.com/operating-system/

Suggested e-Module Links

1. https://www.youtube.com/watch?v=Z6w6JowO5Fw&list=PLBpMYKycVdGb3tlVlmR9Rmx47p6UOVp7W
2. https://www.slideshare.net/priyadeosarkar91/process-management-os-concept
3. https://www.youtube.com/watch?v=HXNV_naAmXE
4. https://www.youtube.com/watch?v=ph2awKa8rY
5. https://www.youtube.com/watch?v=GX1bP94uM6U&list=PL8tc66sMn9Kjt2Wf5H9O-TMqZFQukoCQ1&index=3
6. https://www.youtube.com/watch?v=ecl-x6m5iuE
7. https://www.slideshare.net/JankiShah24/file-management-in-operating-system

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO 7**	**PEO**
CO1	2						1	1,7
CO2	2	3	2	2	1		1	1,2,3,4,5,7
CO3	2	1	2				1	1,2,3,7
CO4	1				1		2	1,5,7
CO5	1	1	1	1	1		1	1,2,3,4,5,7
CO6	2	2	2		1		1	1,2,3,5,7

MODEL QUESTION PAPER
BOARD DIPLOMA MID-SEM-1 EXAMINATION (C-24)
CS-IV-SEMESTER
CS-406–OperatingSystems

TIME: 1HOUR **MAXIMUM MARKS: 20**

PART-A ***MARKS: 4 X 1 =4***

NOTE: 1. Answer all questions.
2. Each question carries one mark.

1. Define operating system.
2. What is buffering?
3. List various scheduling algorithms.
4. Define process.

PART-B ***MARKS: 2 X 3=6***

NOTE: 1. Answer any one question from 5 and 6.
2. Each question carries three marks.

5. a) Distinguish multiprogramming and timesharing operating systems.
(OR)
b) Explain various types of operating systems.
6. a) Explain process state diagram.
(OR)
b) Explain Round Robin scheduling algorithm.

PART-C ***MARKS: 2 X 5=10***

NOTE: 1. Answer any one question from 7 and 8.
2. Each question carries five marks.

7. a) Explain single user and multi user operating systems structures.
(OR)
b) Explain various system calls
8. a) Explain multi threading concept.
(OR)
b) Explain scheduling queuing diagram.

MODEL QUESTION PAPER
BOARD DIPLOMA MID-SEM-II EXAMINATION (C-24)
CS-IV-SEMESTER
CS-406–OperatingSystems

TIME: 1HOUR **MAXIMUM MARKS: 20**

PART-A *MARKS: 4 X 1=4*

NOTE: 1. Answer all questions.
2. Each question carries one mark.

1. Define a deadlock.
2. Give the necessary conditions to occur a dead lock.
3. What is address binding?
4. Define overlay.

PART-B *MARKS: 2 X 3=6*

NOTE: 1. Answer any one question from 5 and 6.
2. Each question carries three marks.

5. a) Explain inter process communication.
(OR)
b) Explain the techniques used to prevent deadlock?
6. a) What is fragmentation? Explain in detail.
(OR)
b) What is segmentation? Explain segmentation.

PART-C *MARKS: 2 X 5=10*

NOTE: 1. Answer any one question from 7 and 8.
2. Each question carries five marks.

7. a) How Banker's algorithm will avoid deadlock?
(OR)
b) Explain how dead lock can be detected and recovered?

8. a) How logical address can be converted to physical address?

(OR)
b) Discuss briefly about simple paging.

MODEL QUESTION PAPER
BOARD DIPLOMA END SEMESTER EXAMINATION (C-24)
CS-IV-SEMESTER
CS-406–OperatingSystems

TIME: 1HOUR **MAXIMUM MARKS: 20**

PART-A *MARKS: 8 X 1=8*

NOTE: 1. Answer all questions.
2. Each question carries one mark.

1. Define the term multiprogramming.
2. What are the necessary conditions to occur a deadlock?
3. List out various file operations.
4. Define a process.
5. Give various page replacement algorithms.
6. What is demand paging?
7. What is meant by seek time?
8. Give the principal of FIFO disk scheduling algorithm.

PART-B

NOTE: 1. Answer any one question from 9, 10, 11 and 12. ***MARKS: 4 X 3=12***
2. Each question carries three marks.

9. (A) Explain FCFS CPU scheduling algorithm with an example.

OR

(B) Explain in brief about paging.

10. (A) Explain how dead lock can be detected and recovered?

OR

(B) Give the difference between SCAN and C-SCAN disk scheduling algorithms.

11. (A) Explain how FIFO and LRU page replacement algorithms will work?

OR

(B) Explain the term demand paging.

12. (A) Explain SSTF disk scheduling algorithm.

OR

(B) Explain directory structure organization in detail.

PART-C

NOTE: 1. Answer any one question from 13, 14, 15 and 16 MARKS: 4 X 5=20

2. Each question carries five marks.

13. (A) Explain various types of schedulers in detail.

OR

(B) How paging is applied on segmentation.

14. (A) How virtual memory concept will increase the size of the main memory.

OR

(B) Explain directory structure organization.

15. (A) Explain with an example LRU and Optimal page replacement algorithm.

OR

(B) Explain the concept thrashing with a neat sketch.

16. (A) Explain various file access methods.

OR

(B) Explain various disk scheduling algorithms with examples.

CS-407 JAVA PROGRAMMING LAB

Course Title:	**Java Programming Lab**	Course Code :	**CS-407**
Semester:	**IV Semester**	Course Group :	**Practical**
Teaching Scheme in Periods(L:T:P):	**1:0:2**	Credits :	**1.25**
Methodology :	**Lecture + Practical**	Total Contact Periods :	**45 Periods**
CIE :	**60 Marks**	SEE :	**40 Marks**

Pre requisites

This course requires the basic knowledge of programming.

Course Content and Blue Print of Marks for SEE

Unit No	**Unit name**	**Hours/ Periods**	**Marks for SEE**			**Marks weightage**	**%Weightage**
			Coding	**Execution**	**Viva**		
1	Java Programming Lab	45	20	10	10	40	100
	Total	45	40			40	100

Course Outcomes

On completion of the course, the student should be able to

Course Outcome	
CO1	Implement basic java programs
CO2	Implement programs on inheritance and interfaces.
CO3	Implement programs on creating and accessing packages and Implement programs on applets
CO4	Implement programs on AWT controls and event handling.
CO5	Implement programs to handle exceptions
CO6	Implement Multithreaded programs and programs to connect with database and retrieve data

CourseContents

Unit Number	UnitName	Periods
1	Fundamental java Programs	**6**
2	Programs on inheritance and interfaces	**7**
3	Programs Packages and Applets	**7**
4	AWT Controls and Even handling	**10**
5	Exception handling	**8**
6	Multithreaded Programming and JDBC	**8**
	Total	**45**

Suggested Reference Books

1. "The Complete Reference Java2 (Third Edition)", Patrick Naughton-Herbert Sheild, Tata McGraw hill.
2. Programming with JAVA a primer by BALAGURUSWAMY
3. Java: A Beginner's Guide, Seventh Edition Paperback – by Herbert Schildt -Oracle press
4. "Head First Java", Kathy Sierra, Bert Bates, O'Reilly.
5. 'Effective Java: A Programming Language Guide' (Java Series) 2nd Edition, by Joshua Bloch Sun copyright.
6. Core Java Volume I--Fundamentals Eleventh Edition by Cay S. Horstmann Pearson publications.
7. "Java2 Programming", Keyur Shah, Tata McGraw.
8. "Java Database Programming with JDBC" by Pratik Patel - The Coriolis Group.

Suggested E-learning references

1. https://www.w3schools.in/java-tutorial/
2. https://www.studytonight.com
3. http://www.Javatpoint.com/Java-tutorial
4. https://www.tutorialspoint.com/java/index.htm
5. http://www.indiabix.com/technical/core-Java/
6. https://www.geeksforgeeks.org/java/

Suggested E-module

1. https://www.youtube.com/watch?v=eIrMbAQSU34
2. https://www.youtube.com/watch?v=GoXwIVyNvX0
3. https://onlinecourses.nptel.ac.in/noc22_cs47/preview
4. https://archive.nptel.ac.in/courses/106/105/106105191/

Suggested Learning Outcomes

Upon completion of the course, the student shall be able to

1. Write and execute a Java Program on control and iterative statements.
2. Write and execute a java program to find the transpose, addition, subtraction and multiplication of a two-dimensional matrix using loops.
3. Write and execute a Java program on command line arguments.
4. Write and execute a Java Program on constructor and Constructor overloading
5. Write and execute a Java Program to illustrate method overloading
6. Write and execute a Java program to practice using String class and its methods.
7. Write and execute a Java Program to implement single inheritance.
8. Write and execute a Java program to implement hierarchical inheritance.
9. Write and execute a Java Program to implement multilevel inheritance
10. Write and execute a Java program using ‘this’ keyword.
11. Writeand execute a java program using Super keyword
12. Write and execute a java program on method overriding
13. Writeand execute java programto avoid method overriding using final.
14. Write and execute a program to demonstrate the use of interface.
15. Write and execute a java program to implement multiple inheritance using interface.
16. Write and execute a Java program to Creating and accessing user defined packagesand sub packages
17. Write and execute a Java program on applet life cycle.
18. Write and execute a Java program on all AWT controls along with Events and itsListeners.
19. Write and execute a Java program on mouse and keyboard events.
20. Write and execute a Java program on inbuilt Exceptions.
21. Writeand execute a Java program on Exception handling.
22. Write and execute a program to implement multi-catch statements
23. Write and execute a java program on nested try statements.
24. Write and execute a java program to create user-defined exceptions.
25. Write and execute a program to create thread (i)extending Thread class (ii) implementing Runnable interface
26. Write and execute a java program to create multiple threads and thread priorities, ThreadGroup.

27. Write and execute a java program to implement thread synchronization.
28. Write and execute a java program on Inter Thread Communication.
29. Write and execute a java program on deadlock.
30. Write and execute a Java program to establish connection with database.
31. Write and execute a Java program to perform DDL and DML statements using JDBC.

Suggested Student Activities

Student activity like mini-project, quizzes, etc. should be done in group of 3-5 students.

- Each group should do any one of the following type activity or any other similar activity related to the course and before conduction, get it approved from concerned course coordinator and program co-coordinator.
- Each group should conduct different activity and no repeating should occur.
  1. Study different Integrated Development Environments (IDEs) available for executing java programs and prepare a report.
  2. Develop some simple window based applications like notepad, calculator etc using AWT components.
  3. Refer to online content and videos to get more knowledge on database concepts.
  4. Interact with industry people who are working in java and advanced java technologies and prepare a report.
  5. Prepare quiz on java course related questions and conduct.
  6. Participate in state level or national level technical conferences.
  7. Participate in various technical coding competitions related to java programming.
  8. Develop some projects to design websites like Hotel Management System.

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO 7**
CO1	3	1	2	1		1	2
CO2	1	2	1			1	1
CO3	2			1		2	2
CO4	1	1	3			3	1
CO5	1		2	2		2	1
CO6	1	1				2	

CS-408 PYTHON PROGRAMMING LAB

Course Title:	**Python Programming Lab**	Course Code :	**CS-408**
Semester:	**IV Semester**	Course Group :	**Practical**
Teaching Scheme in Periods(L:T:P):	**1:0:2**	Credits :	**1.25**
Methodology :	**Lecture+ Practical**	Total Contact Periods :	**45 Periods**
CIE :	**60 Marks**	SEE :	**40 Marks**

Pre requisites

This course requires the basic skills of programming and hardware

Course Outcomes

On completion of the course, the student should be able to;

CO1	Familiarize with python IDE and basics programs of python
CO2	Develop programs for conditionals and loops
CO3	Create programs for functions,strings and data structures
CO4	Build classes, modules and packages
CO5	Develop multithread application and handles runtimes exceptions
CO6	Process files, design GUI, database operations, installation of modules and packages

Course Content and Blue Print of Marks for SEE

Unit No	Unit name	Hours/ Periods	Marks for SEE			Marks weightage	%Weightage
			Coding	Execution	Viva		
1	PYTHON LAB	45	20	10	10	40	100
	Total	45	40			40	100

CourseContents

Unit Number	UnitName	Periods
I	**Introduction & Basics of Python**	**5**
2	**Conditionals and Loops**	**8**
3	**Functions, Strings and Data Structures**	**8**
4	**Classes, Modules and Packages**	**8**
5	**Exception handling and Multithreading**	**8**
6	**File Processing, Design GUI, Connect to Database, and working with packages**	**8**
	Total	**45**

Text Books

1. If used, the __setitem__ index assignment method, The Fundamentals of Python: First Programs, 2011, Cengage Learning.
2. Think Python First Edition, by Allen B. Downey, Orielly publishing

Reference Books

1. James Payne, Beginning Python using Python 2.6 and Python 3, Wrox publishing
2. Paul Gries, Practical Programming: An Introduction to Computer Science using python 3,The Pragmatic Bookshelf, 2nd edition (4 Oct. 2013)
3. Charles Dierach, Introduction to Computer Science using Python
4. Introduction to Computation and Programming Using Python. John V. Guttag, TheMIT Press.
5. Raspberry Pi Cookbook 2014 by Simon Monk
6. Core Python Programming 2018 by R. Nageswara Rao
7. Python: For Beginners: by Timothy C. Needham
8. Sams Teach Yourself Python Programming for Raspberry Pi in 24 Hours Second Edition, Sams publication by Christine Bresnahan, Richard Blum
9. Python Programming Fundamentals- A Beginner's Handbook 2018 by NischaykumarHegde

1. Familiarize with python IDE

2. Exercise on Basic python programs(factorial,Armstrong number,area of the circle,Fibonacci)

3. Write a python programs to perform matrix addition and multiplication

4. Write a python programs on various data structures

5. Excercise programs on Threads

6. Excercise programs on Exceptions

7.Write a python program to achieve thread synchronization in multithreaded environment

8. Design Graphical user interface application using different widgets

9. Design GUI using different Geometry Managers

10. Develop a python program to handle events generated by various widgets

11. Develop a python program to open, close, read, write, and append data into the files

12 Develop a python program to connect to MySql database

13. Develop a python program for creation of table, insert a row in a table, and update an entry in a table

14. Develop a python program to execute stored procedures

15.Demonstrate the installation of various packages and modules numpy,pandas,and matplotlib.

Suggested Student Activities

Student activity like mini-project, quizzes, etc. should be done in group of 3-5 students.

- Each group should do any one of the following type activity or any other similar activity related to the course and before conduction, get it approved from concerned course coordinator and program co-coordinator.

- Each group should conduct different activity and no repeating should occur.
- Develop programs
- Establishing the connection with the database

CO-PO Mapping Matrix

- Familiarize with the use of shell scripting
- Hands on practice with the available editors
- Develop projects to participate in the tech-fests

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	
CO1	1	2	2				1	1,2,3,7
CO2	3	1	1	2	2		3	1,2,3,4,5,7
CO3	2	1	1	2	1		3	1,2,3,4,5,7
CO4	3	2	2	2	2		3	1,2,3,4,5,7
CO5	3	2	2	2	2	1	3	1,2,3,4,5,6,7
C06	3	2	2	1	1	1	3	1,2,3,4,5,6,7

CS-409 RELATIONAL DATABASE MANAGEMENT SYSTEMS LAB

Course Title:	**Relational database management systems Lab**	Course Code:	**CS-409**
Semester:	**IV Semester**	Course Group:	**Practical**
Teaching Scheme in Periods(L:T:P):	**1:0:2**	Credits:	**1.25**
Methodology :	**Lecture+ Practical**	Total Contact Periods:	**45 Periods**
CIE :	**60 Marks**	SEE:	**40 Marks**

Pre requisites

Knowledge ofbasics DBMS theoretical concepts.

Course Content and Blue Print of Marks for SEE

Unit No	Unit name	Hours/ Periods	Marks for SEE			Marks weightage	%Weightage
			Coding	Execution	Viva		
1	RDBMS LAB	45	20	10	10	40	100
	Total	45	40			40	100

Course Outcomes

On completion of the course, the student should be able to;

CO's	Description
CO1	Use the concepts ofdatabasetechnologies.
CO2	Implement ER diagrams
CO3	PrepareQueriestointeractwithdatabaseusingSQL DML/DDLcommands
CO4	Develop queries using SQL functions
CO5	Implement Databaseschemaobjectsforagivenproblem-domain.
CO6	DevelopprogramsusingPL/SQL.

Course contents:

Unit Number	UnitName	Periods
1	ConceptsofDatabases	**2**
2	Data ModelingUsingtheEntity Relationship(ER)Model,Relational model	**3**
3	NormalizationandfundamentalsofData BaseTransactionProcessing,SQL concepts	**8**
4	SQL Functions,Sub queries	**10**
5	Conceptof SQLand managementofschemaobjects.	**10**
6	PL/SQL	**12**
	Total	**45**

Recommend e-Books

1. "An Introduction to Database Systems" 8th edition by C J Date.

2. "DATABASE SYSTEM CONCEPTS" 6th edition by Abraham Silberschatz Yale University, Henry F. Korth Lehigh University, S. Sudarshan Indian Institute of Technology, Bombay.

3. "Fundamentals of Database Systems" Sixth edition, 2014, RamezElmasri, Shamkan B. Navathe, Pearson Education, ISBN- 9788131792476.

4. "DatabaseManagemetSystems"RaghuRamakrishnanandJohannesGehrke-3rdEdition,McGraw-Hill, 2003.

Suggested E-learning references

1. https://www.w3schools.com/sql
2. https://www.tutorialspoint.com/plsql/index.htm

Suggested Learning Outcomes

Upon completion of the course, the student shall be able to

List of Exercises:

1. Install Oracle or MySQL database.
2. Develop a ER diagram for University/Hotel management/Library Management.
3. Prepare and execute queries to create tables.
4. Prepare and execute queries to insert records into tables.
5. Prepare and execute queries to update records in a table.
6. Prepare and execute queries to modify the structure of the table.
7. Prepare and execute queries to retrieve data from database using SELECT command.
8. Prepare and execute queries using clauses like WHERE, ORDER, IN, LIKE, AND, OR, NOT.
9. Develop queries using numeric functions.
10. Develop queries using string functions.
11. Develop queries using date functions.
12. Develop queries using aggregate functions.
13. Develop queries using scalar functions.
14. Prepare and execute queries using set operators.
15. Developsub queries.
16. Prepare queries using SQL joins.
17. Create tables using integrity constraints.
18. Implement Sequences.
19. Implement Synonyms.
20. Implement creating and deleting indexes.
21. Implement Views.
22. Develop programs using PL/SQL control statements.
23. Develop programs using PL/SQL Functions.
24. Develop programs using PL/SQL Recursion.
25. Develop programs using PL/SQL Stored procedures with- in,out,in out parameters.
26. Develop programs using PL/SQL to handle exceptions.
27. Develop programs using PL/SQL cursors – implicit and explicit.
28. Implement Triggers.
29. Implement Packages.

Suggested Student Activities

1. Tech fest/Srujana
2. Surprise Test

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	
CO1	2	-	-	-	-	-	1	1,7
CO2	2	1	1	-	-	-	1	1,2,3 7
CO3	3	2	2	1	1	-	2	1,2,3,4 ,5,7
CO4	2	2	2	2	-	2	2	1,2,3,4,6 ,7
CO5	3	2	2	2	1	2	2	1,2,3,4,5,6 ,7
CO6	2	2	2	2	-	2	2	1,2,3,4,6 ,7

HU- 410 EMPLOYABILITY SKILLS LAB

Course Title	Employability Skills Lab	Course Code	HU-410
Semester	IV	Course Group	Practical
Teaching Scheme in periods (L:T:P)	15:0:30	Credits	1.25
Methodology	Lecture + Practical	Total Contact Hours	45 (3 periods per week)
CIE	60 Marks	SEE	40 Marks

Rationale:

The course is designed to impart employability skills to make the students of diploma get the initial employment, maintain the employment and get better employment, if they wish.

Prerequisites:

The course requires the basic knowledge of vocabulary, grammar, four language learning skills, viz. listening, speaking, reading and writing and life skills.

Course Contents

Module 1: Presentation Skills: Duration: 9 Periods (L3 P6)

a) Significance of presentation

b) What makes a good presentation?

- **i.** Understand, Collect, Organize, Use presentational aids and Practice

c) Tips for an effective presentation.

- **ii.** Good Beginning – Greeting, Confidence, Body Language, Opening Ideas (Funny Videos, Ridicule. Asking Questions, Quote someone/Proverb or telling a story/referring an historical event)
- **iii.** Unveiling – Develop systematically, usage of appropriate linkers or discourse markers. Eye contact and Effective usage of PPTs
- **iv.** Conclusion – Summarize - Giving time to the audience for queries and Time management

d) Guidelines for PPTs

Module 2: JAM Duration: 6 Periods (L 2 P 4)

a) What is JAM?

b) Significance of JAM

c) Enhancing Speaking skills, fluency, usage, coherence, spontaneity, voice modulation, eye contact, body language, Creativity, Sense of humor, Confidence and Time management.

d) Learn avoiding hesitation, deviation and repetition

Module 3: Group Discussion Duration: 9 Periods (L 3 P 6)

a) Purpose of Group Discussion

b) Types of Group Discussion

c) Different expressions and phases and their effective usage

d) Dos and Don'ts of a Group Discussion

e) Practice.

Module 4: Interview Skills **Duration: 6 Periods (L 2 P 4)**

i. Importance of interview skills
ii. Types of interviews
   a) Face to Face / One to Many,
   b) Telephonic.
iii. Understanding the process of interview.
   a) Before the interview
   b) On the day of the interview
   c) After the interview
iv. FAQs, Common expressions of an interviewer and interviewee
v. Body language,Grooming and Attire.

Module 5: Workplace Awareness and Professional Ethics

Duration: 9 Periods (L 3 P 6)

a) Workplace etiquette
b) Knowledge, skills and attributes useful at workplace
c) Workplace Relationships
d) Gender sensitization
e) Professional Ethics

Module 6: Writing Skills at Workplace: **Duration: 6 Periods (L 2 P 4)**

a)Various writing formats useful at workplace

i) Emails
ii) Notice
iii)Agenda
iv)Minutes of meeting
v)Circular Memo
vi) Press release

Course Outcomes

CO1	Make effective presentation, develop public speaking skills and learn to make visually attractive PPTs.
CO2	Converse fluently and accurately accordingly in JAM sessions.
CO3	Group Discussions will enhance the willingness to take the Initiative, accept adaptability in turn developing leadership qualities and Communication Skills
CO4	Understand purpose and process of interview in turn knowing how to prepare and succeed in interview

CO5	Build strong workplace relationships by learning workplace etiquette, professional ethics and gender sensitization.
CO6	Learn various writing formats useful at workplace and to develop an ability to apply technical information in documentation.

CO-PO Matrix

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	Mapping POs
CO1					2	2	2	5,6,7
CO2					2	2	3	5,6,7
CO3					1	3	2	5,6,7
CO4					2	2	3	5,6,7
CO5					2	2	3	5,6,7
CO6					2	3	3	5,6,7

Evaluation Pattern:

I.ContinuousInternalExamination:		**60Marks**
a.MidSem- I	20marks	
Syllabus: i. Presentation Skills		
ii. JAM b.MidSem—II	20Marks	
Syllabus: i. Group Discussion		
ii. Interview Skills		
c.**Internalassessment:**	20marks	
i. Seminars:	10marks	
ii.Assignments:	5marks	
iii.Labrecordsubmission:	5marks	
II.SemesterEndExamination: a.Listening:	10Marks	**40Marks**

*b.*LifeSkillstopics:	15Marks	
c.VivaVoice	15Marks	

References:

- Adair, John. *Effective Communication*. London: Pan Macmillan Ltd., 2003. Ajmani, J. C. *Good English: Getting it Right*. New Delhi: Rupa Publications, 2012.
- Amos, Julie-Ann. *Handling Tough Job Interviews*. Mumbai: Jaico Publishing, 2004. Collins, Patrick. *Speak with Power and Confidence*. New York: Sterling, 2009.
- Fensterheim, Herbert and Jean Baer. *Don't Say Yes When You Want To Say No*. New York: D Raman, Meenakshi & Sangeeta Sharma. *Technical Communication: Principles and Practice*. Second Edition. New Delhi: Oxford University Press, 2011.

E-Learning Resources:http://www.dailywritingtips.com/

- http://www.englishdaily626.com/c-errors.phphttp://www.owlnet.rice.edu/~cainproj/http://www.thehumorsource.com/
- http://www.indiabix.com/group-discussion/topics-with-answers/http://networketiquette.net/
- https://public.wsu.edu/~brians/errorshttp://www.bbc.co.uk/worldservice/learningenglish/radio/specials/15

BOARD DIPLOMA EXAMINATION (C-24)
MID SEMESTER EXAMINATION – I
HU-410 EMPLOYABILITY SKILLS LAB

Time: One Hour **Total Marks: 20**

Part – A **10 marks**

Instruction: Answer any one of the following questions.

1. Write the guidelines of making a PPT?
2. What are some common mistakes which should be avoided during presentation?
3. How can you use audio -visual aids effectively to enhance your presentation?

Part – B **10 marks**

Instruction: Answer any one of the following questions.

1. What are the tips to be followed to start a JAM session?
2. What are the do's and don'ts of presenting JAM?
3. What is JAM? Write significance of JAM in communication skills.

BOARD DIPLOMA EXAMINATION (C-24)
MID SEMESTER EXAMINATION – II
HU-410 EMPLOYABILITY SKILLS LAB

Time: One Hour **Total Marks: 20**

Part – A **10 marks**

Instruction: Answer any one of the following questions.

1. List the abilities required by a person to succeed in a Group Discussion.
2. Explain how to initiate, continue and conclude a Group Discussion and mention some suitable phrases to be used in each step.
3. Mention the guidelines to be followed in a Group Discussion.

Part – B **10 marks**

Instruction: Answer any one of the following questions.

1. What precautions do you take for a telephonic interview?
2. How do you prepare for an interview?
3. Explain interview process and suitable attire for an interview?

BOARD DIPLOMA EXAMINATION (C-24)
SEMESTER END EXAMINATION
HU-410 EMPLOYABILITY SKILLS LAB

Time: Three Hours **Total Marks: 40**

Part – A **10 marks**

Instruction: Pick any one question from the given lot.

1. Write the guidelines involved in making a good presentation?
2. Describe the steps involved in JAM.
3. Mention different types phrases used in Group Discussion.
4. List few professional ethics useful at workplace.
5. Write a notice, agenda and minutes of meeting on any occasion.

Part – B **15 marks**

6. Interview / Group Discussion

Part – C **15 marks**

7. Viva Voice