

C-18 - Curriculum

Diploma in Computer Engineering



**State Board of Technical Education & Training
Telangana, Hyderabad**

IV Semester

TEACHING AND EXAMINATION SCHEDULE
--

Sl N o	Course Code	Course Name	Teaching Scheme					Examination Scheme						
			Instruction Periods per week			Total Periods per semester	Credits	Continuous Internal Evaluation			Semester End Examination			
			L	T	P			Mid Sem1	Mid Sem2	Internal Evaluati on	Max Marks	Min Mark s	Total Marks	Min marks for Passing including internal
1	18CM 401F	ADVANCED MATHEMATICS	3	1	0	60	3	20	20	20	40	14	100	35
2	18CM 402C	OOPS THROUGH C++	3	1	0	60	3	20	20	20	40	14	100	35
3	18CM 403C	.NET PROGRAMMING THROUGH C#	3	1	0	60	3	20	20	20	40	14	100	35
4	18CM 404C	MICRO PROCESSORS	3	1	0	60	3	20	20	20	40	14	100	35
5	18CM 405C	OPERATING SYSTEMS	3	1	0	60	3	20	20	20	40	14	100	35
6	18CM 406P	OOPS THROUGH C++ LAB PRACTICE	1	0	2	45	1.5	20	20	20	40	20	100	50
7	18CM 407P	.NET PROGRAMMING THROUGH C# LAB PRACTICE	1	0	2	45	1.5	20	20	20	40	20	100	50
8	18CM 408P	MICRO PROCESSORS LAB PRACTICE	1	0	2	45	1.5	20	20	20	40	20	100	50
9	18CM 409P	WEB DESIGNING LAB PRACTICE	1	0	2	45	1.5	20	20	20	40	20	100	50
10	18CM 410P	ADVANANCED COMMUNICATION & LIFE SKILLS LAB PRACTICE	1	0	2	45	1.5	20	20	20	40	20	100	50
11		SKILL UPGRADATION-IV	0	0	7	105	2.5	0	0	Rubrics			--	-
			20	5	17	630	25	200	200	200	400	170	1000	425
	Activities: student performance is to be assessed through Rubrics													

ADVANCED ENGINEERING MATHEMATICS

Course Title : ADVANCED ENGINEERING MATHEMATICS	Course Code : 18CM401F
SEMESTER : IV	Course Group : Foundation
Teaching Scheme (L : T : P) : 3 : 1 : 0 (in Periods)	Credits : 3 Credits
Type of Course : Lecture + Assignments	Total Contact Periods : 60
CIE : 60 Marks	SEE : 40 Marks
Programmes : Common to all Engineering Diploma Programmes	

Pre requisites:

This course requires the knowledge of Engg. Mathematics at Diploma first year level and Applied Engg. Mathematics at Diploma III Semester level.

Course Outcomes:

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

CO 1	Solve simple Homogeneous Linear Differential Equations
CO 2	Solve simple Non-Homogeneous Linear Differential Equations
CO 3	Express $f(x)$ as a Fourier series in the given interval
CO 4	Express $f(x)$ as a Fourier Half-Range Cosine series and Sine series
CO 5	Find Laplace transforms of simple functions
CO 6	Find Inverse Laplace transforms of simple functions and solve Linear Differential Equations using Laplace Transformations.

Blue Print of Marks for SEE

Unit No	Unit Name	Periods	Questions to be set for SEE			
			R		U	A
1	Homogeneous Linear Differential equations with constant coefficients	05	Q4	Q1	Q9(a)	Q13(a)
2	Non-Homogeneous Linear Differential equations with constant coefficients	15				
3	Fourier series	10		Q2	Q10(a)	Q14(a)
4	Fourier Half-range series	05				
5	Laplace Transforms	10		Q3	Q9(b), Q11(a), Q11(b)	Q13(b), Q15(a), Q15(b)
6	Inverse Laplace transforms	15			Q7,Q8	Q10(b), Q12(a), Q12(b)
Total		60	8		8	8

Course Contents:

Unit – I

Duration: 05 Periods (L:3.0 – T:2.0)

Homogeneous Linear Differential equations with constant coefficients

Homogenous linear differential equations with constant coefficients of order two and higher with emphasis on second order.

Unit – II

Duration: 15 Periods (L:12.0 – T:3.0)

Non-Homogeneous Linear Differential equations with constant coefficients

Non-homogenous linear differential equations with constant coefficients of the form $f(D)y = X$, where X is in the form $k(a \text{ constant})$, e^{ax} , $\sin ax$, $\cos ax$, x^n , ($n = 1, 2, 3$) Complimentary Function (CF), Particular Integral (PI) and General Solution (GS).

Unit-III

Duration: 10 Periods (L: 8.0 – T: 2.0)

Fourier series

Orthogonality of trigonometric functions, Representation of a function in Fourier series over the interval $(c, c + 2\pi)$, Euler's formulae, sufficient conditions for existence of Fourier series for a function. Even, Odd functions and Fourier series over the Interval $(0, 2\pi)$ and $(-\pi, \pi)$

Unit – IV

Duration: 05 Periods (L: 3.0 – T: 2.0)

Fourier Half-range series

Representation of a function as Fourier Half-range Sine series and Cosine series over the interval $(0, \pi)$

Unit – V

Duration: 10Periods (L: 7.0 – T:3.0)

Laplace Transformations

Definition, sufficient conditions for existence of Laplace Transform, Laplace Transform of elementary functions, linearity property, Change of scale property, First shifting theorem, multiplication by t^n , division by t , Laplace Transform of derivatives and integrals, unit step function, Laplace Transform of second shifting theorem

Unit – VI

Duration: 15 Periods (L: 12.0 – T: 3.0)

Inverse Laplace transforms:

Inverse Laplace transforms- shifting theorems and change of scale property, multiplication by s^n and division by s –Inverse Laplace Transform using partial fractions – convolution theorem (no proof) – application of Laplace Transformations to solve ordinary differential equations of second order with initial conditions.

Recommended Books:

1. Higher Engineering Mathematics, B.S.Grewal .
2. Laplace Transforms - Murray R. Spigel .
3. Ordinary Differential Equations – R. S. Aggarwal.
4. Fourier Series – A.R. Vasishtha and Gupta.

Suggested E-Learning references:

1. www.freebookcentre.net/mathematics/introductory-mathematics-books.html
2. E-books: www.mathebook.net

Suggested Learning Outcomes

Unit-I

1.0 Solve Homogeneous linear differential equations with constant coefficients in engineering situations

- 1.1 Solve Differential equations of the type $(aD^2 + bD + c)y = 0$ when the roots of the auxiliary equation are real and different, real and repeated, complex.
- 1.2 Solve the higher order homogeneous Linear differential equations with constant coefficients.

Unit-II

2.0 Solve Non Homogeneous linear differential equations with constant coefficients in engineering situations

- 2.1 Explain the concept of complementary function, particular Integral and general solution of a differential equation.
- 2.2 Solve n^{th} order differential equation of the type $f(D)y = X$ where $f(D)$ is a polynomial of second order and X is a function of the form $k, e^{ax}, \sin ax, \cos ax, x^n$.
- 2.3 Solve simple problems on the above types of 2.2

Unit-III

3.0 Understand the Fourier series expansion of functions

- 3.1 Define the orthogonality of functions in an interval.
- 3.2 Define Fourier series of a function on the interval $(C, C+2\pi)$ and write the Euler's formulae for determining the Fourier coefficients.
- 3.3 Write sufficient conditions for the existence of Fourier series for a function.
- 3.4 Write Fourier series of simple functions in the range $(0, 2\pi)$ and $(-\pi, \pi)$.
- 3.5 Write Fourier series for even and odd functions in the interval $(-\pi, \pi)$
- 3.6 Solve simple problems on even and odd functions in the interval. $(0, 2\pi)$ and $(-\pi, \pi)$

Unit- IV

4.0 Understand the Half – Range Fourier series expansion of functions

- 4.1 Write Half – Range Cosine series of a function in the range $(0, \pi)$.
- 4.2 Write Half – Range Sine series of a function in the range $(0, \pi)$.
- 4.3 Solve simple problems on Half – Range Cosine and Sine series over the interval $(0, \pi)$

Unit-V

5.0 Understand Laplace transforms

- 5.1 Write the definition of Laplace Transform and Laplace transform of standard functions.
- 5.2 Explain the sufficient conditions of existence of Laplace Transform.
- 5.3 Write the properties of Laplace Transform – Linearity property, First shifting theorem,

Change of Scale property.

- 5.4 Solve simple problems using the above properties.
- 5.5 Write formulae for Laplace transform of $t^n f(t)$, $\frac{f(t)}{t}$, $f^n(t)$, $\int_0^t f(u)du$ in terms of Laplace transform of $f(t)$
- 5.6 Solve simple problems using the above formulae.
- 5.7 Define unit step function and write the Laplace Transform of unit step function.
- 5.8 Write Second shifting theorem.

Unit-VI

6.0 Use Laplace transforms and Inverse Laplace transforms to solve differential equation in engineering problems

- 6.1 Define inverse Laplace Transform and write inverse Laplace Transforms of standard functions.
- 6.2 Solve simple problems on Inverse Laplace Transforms.
- 6.2 Write Shifting theorems and Change of scale property of inverse Laplace Transform.
- 6.3 Solve simple problems on 6.2
- 6.4 Write inverse Laplace Transforms corresponding to Laplace Transform of the functions $t^n f(t)$, $\frac{f(t)}{t}$, $f^n(t)$, $\int_0^t f(u)du$
- 6.5 Solve simple problems on 6.4
- 6.6 Define convolution of two functions and state convolution theorem.
- 6.7 Solve simple problems on Convolution theorem.
- 6.8 Use Laplace and inverse Laplace Transforms to solve simple differential equations of Second order.

Suggested Student Activities:

1. Student visits Library to refer Standard Books on Mathematics and collect related material.
2. Quiz
3. Group discussion
4. Surprise tests
5. Seminars
6. Home Assignments.

CO-PO Mapping Matrix

	Basic knowledge	Discipline Knowledge	Experiments and practice	Engineering Tools	Engineer and society	Environment & sustainability	Ethics	Individual and Team work	Communication	Lifelong learning	Linked PO
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	
CO1	3	2	2	1			1			3	1,2,3,4,7,10

CO2	3	2	2	1			1			3	1,2,3,4,7,10
CO3	3	2	2	1			1			3	1,2,3,4,7,10
CO4	3	2	2	1			1			3	1,2,3,4,7,10
CO5	3	2	2	1			1			3	1,2,3,4,7,10
CO6	3	2	2	1			1			3	1,2,3,4,7,10

Internal Evaluation

Test	Units	Marks
Mid Sem 1	1 and 2	20
Mid Sem 2	3 and 4	20
Slip Test 1	1 and 2	5
Slip Test 2	3 and 4	5
Assignments	-	5
Seminars	-	5
	Total	60

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 $\frac{1}{4}$ of a page, 1page 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

Unit No	Questions to be set for SEE				
	R		U		A
I	Q4	Q1		Q9(a)	Q13(a)
II					
III		Q2		Q10(a)	Q14(a)
IV					
V		Q3	Q5,Q6	Q9(b), Q11(a), Q11(b)	Q13(b), Q15(a), Q15(b)
VI					
Total Questions	8		8	8	

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA
BOARD DIPLOMA EXAMINATIONS
MID SEM –I, MODEL PAPER, IV SEMESTER
ADVANCED ENGINEERING MATHEMATICS

TIME: 1: 00 Hours

Max. Marks: 20

PART-A

Instructions: 1. Answer **ALL** questions 04 X 01 = 04
 2 Each question carries **ONE** mark

1. Write the General solution of $(aD^2+bD+c)y = 0$, whose roots of auxiliary equation are real and distinct.
2. Find the roots of auxiliary equation of the differential equation $(D^2 + 2D + 1)y = 0$
3. Find the Particular Integral of $(D^2 - 4D + 1)y = e^{3x}$
4. Find the P.I of $(D^2 - 16)y = \sin 4x$

PART-B

Instructions: 1. Answer any **TWO** questions 02 X 03 = 06
 2. Each question carries **THREE** marks

5 a) Solve: $(D^2 + 3D - 54)y = 0$

Or

5 b) Solve : $(D^2 + 16)y = 0$

6 a) Solve : $(D^2 + 4D + 4)y = e^{2x}$

Or

6 b) Find P.I of $(D^3 + D)y = \sin 2x$

PART C

Instructions: 1. Answer **ALL** questions 02 X 05 = 10
 2. Each question carries **FIVE** marks

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

Or

7 b) Solve : $(D^3 - D^2 - D + 1)y = 0$

8 a) Solve : $(D^2 + 36)y = \sin^2 x$

Or

8 b). Solve : $(D^2 + 3D + 2)y = x^2$

@@@

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA
BOARD DIPLOMA EXAMINATIONS
MID SEM –II, MODEL PAPER, IV SEMESTER
ADVANCED ENGINEERING MATHEMATICS

TIME: 1: 00 Hours**Max. Marks: 20****PART-A**

- Instructions: 1. Answer **ALL** questions 04 X 01 = 04
 2 Each question carries **ONE** mark
1. Define periodic function and give one example
 2. Define Fourier series of the function $f(x)$ in the interval $(0, 2\pi)$
 3. Write Half-range sine series of $f(x)$ in the interval $(0, \pi)$
 4. Find a_0 for $f(x) = e^x$ in $0 < x < \pi$

PART-B

- Instructions: 1. Answer any **TWO** questions 02 X 03 = 06
 2. Each question carries **THREE** marks
- 5 a). If $f(x) = x^2$ in $(0, 2\pi)$, then find the value of a_n in Fourier series of $f(x)$
- Or
- 5 b) If $f(x) = |x|$ in $(-\pi, \pi)$, then find the value of a_1 in Fourier series of $f(x)$
- 6 a). Find the value of a_n in half-range Cosine series for the function $f(x) = e^x$ in $(0, \pi)$
- Or
- 6 b). Obtain the Fourier Half – Range Sine series for $f(x) = (\pi - x)$ in the interval $(0, \pi)$

PART C

- Instructions: 1. Answer any **TWO** questions 02 X 05 = 10
 2. Each question carries **FIVE** marks
- 7 a). Obtain the Fourier series for $f(x) = x$ in the interval $0 < x < 2\pi$
- Or
- 7 b). Find the Fourier series for $f(x) = (x - x^2)$ in the interval $(-\pi, \pi)$. Hence show that
- $$\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots + \frac{\pi^2}{12}$$
- 8 a) Express $f(x) = \pi x - x^2$ as a half-range Sine series in $(0, \pi)$
- Or
- 8 b). Find the half –range cosine series for the function $f(x) = x^2$ in the interval $(0, \pi)$

BOARD DIPLOMA EXAMINATION, (C-18)
SEMESTER END EXAM MODEL PAPER
IV SEMESTER EXAMINATION
ADVANCED ENGINEERING MATHEMATICS

Time: 2 hours

[Total Marks: 40]

PART-A

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

1. Find the roots of auxiliary equation of the differential equation $(D^2 + 4D)y = 0$.
2. Define Fourier Series for the function $f(x)$ in the interval $(c, c+2\pi)$
3. Find the Particular Integral of $(D^2 - 4D + 1)y = e^x$
4. Find $L(e^{2t} + \cos 3t)$
5. Find $L(t + 5\cos ht)$
6. State the First Shifting theorem of Laplace Transforms.
7. Find $L^{-1}\left(\frac{1}{s-3} + \frac{s}{s^2+4}\right)$
8. Find $L^{-1}\left(\frac{1}{2s+5}\right)$

PART-B

Instructions: 1. Answer any **FOUR** questions 04 X 03 = 12
 2. Each question carries **THREE** marks

9. a) Solve: $(D^2 + D + 1)y = 4e^{3x}$
 Or
 9 b) Find $L(t\cos 3t)$
- 10 a) Find Half Range Sine Series of $f(x) = x$ in $(0, \pi)$
 Or
 10 b) Find $L^{-1}\left(\frac{s+1}{s^2+6s-7}\right)$
- 11 a) If $L\{f(t)\} = \frac{20-4s}{s^2-4s+20}$, find $L\{f(3t)\}$
 Or
 11 b) Find $\int_0^\infty t \cdot e^{-2t} \sin 3t dt$ using Laplace Transform Technique
- 12 a) Show that $L^{-1}\left(\frac{1}{s(s^2+a^2)}\right) = \frac{1-\cos at}{a^2}$

12 b) Find $L^{-1}\left(\frac{s}{(s+2)^2+4}\right)$

PART C

Instructions:

1. Answer any **FOUR** questions

04 X 05 = 20

2. Each question carries **FIVE** marks

13. a) Solve : Solve: $(D^2 + D - 2)y = x + \sin x$

Or

13 b) Find $L[te^t \sin 3t]$

14 a) Expand $f(x) = x^2$ as a Fourier series in the interval $(-\pi, \pi)$

Or

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

15 a) Find $L\left(\frac{\sin 3t \cos t}{t}\right)$

Or

15 b) Evaluate $L\left\{\int_0^t \frac{\sin t}{t} dt\right\}$

16 a) Find $L^{-1}\left(\frac{1}{(s+1)(s+2)}\right)$ using Convolution theorem .

Or

16 b). Solve the differential equation $y'' - 2y' - 8y = \sin t$, when $y(0) = 3$, $y'(0) = 6$ by

Laplace Transform method.

OOPs through C++

Course Title : OOPs through C++	Course Code : 18CM402C
Semester : IV	Course Group : Core
Teaching Scheme in Hrs (L:T:P) : 3:1:0	Credits : 3
Type of course : Lecture + Assignments	Total Contact Hours : 60 Periods
CIE : 60 Marks	SEE : 40 Marks

Prerequisites

Knowledge of C Language.

Course Outcomes

Upon completion of the course the student shall be able to

Course Outcome	
CO1	Learn the Principles of object oriented programming.
CO2	Develop programs using classes, objects and functions.
CO3	Understand C++ I/O operations.
CO4	Develop programs for constructors, destructors and operator overloading concepts.
CO5	Learn base class, derived class and types of inheritance and develop programs for different types of inheritances, virtual base class and virtual functions.
CO6	Develop programs for different types of templates.

Course Contents

- 1. Principles of object oriented programming:** **Duration: 07 Periods**
Software crisis - Software evolution - Procedure oriented programming - Object oriented paradigm - basic concepts of object oriented programming - benefits of OOP's.
- 2. Introduction to C++** **Duration: 14 Periods**
Structure of C++ program - I/O Operations – statements – keywords - operators in C++ - dynamic memory allocation - default arguments – Class - object functions - classes & structures - friend function - inline functions - passing objects to functions – pass by value and pass by reference - returning objects from functions - virtual function - function overloading.
- 3. C++ I/O operations:** **Duration: 06 Periods**
C++ I/O operators - formatted I/O - I/O manipulators - file I/O - binary I/O functions - file I/O functions.
- 4. Constructors, Destructors and Operator Overloading :** **Duration: 11 Periods**
Constructor and destructor - Parameterized constructors - Multiple Constructors - Constructors with default arguments - Copy Constructor – dynamic constructor - Destructors - Operator Overloading - Overloading of Binary Operators - Overloading of Unary Operators - Rules for overloading of operators - Example programs - operator overloading.
- 5. Derived classes and inheritance:** **Duration: 12 Periods**
Base Class and derived class - access control - types of inheritance – Single, Multi level, Multiple, Hybrid, Multipath, Hierarchical - virtual base class - virtual functions.
- 6. Templates :** **Duration: 10 Periods**
Need for Templates – classification of templates, function templates – single argument and multiple arguments - class templates.

Recommended Books

- | | | |
|--|---|-----------------------------|
| 1. Teach yourself C++ | - | Helbertschildt Osborne McG |
| 2. Object-oriented Programming with C++ | - | PoornachandraSarang PHI |
| 3. Programming with C++ | - | E. Balaguruswamy – TMH |
| 4. Computer Science: A Structured Approach using C++ | - | Forouzan/Gillberg - Thomson |
| 5. C++ & OOPS Paradigm | - | DebasishJana PHI |

Special Learning Outcomes

Upon completion of the course the student shall be able to

1. Principles of object oriented programming

- 1.1 History of Software crisis.
- 1.2 Know about Software evolution.
- 1.3 Understand procedure oriented programming.
- 1.4 Describe Object oriented paradigm.
- 1.5 State Basic concepts of object oriented programming.
- 1.6 List the Benefits of OOP's.
- 1.7 List different types of Object oriented programming languages.

2. Introduction to C++

- 2.1 Write the structure of C++ program.
- 2.2 Demonstrate to Create, compile, link and execute a C++ program.
- 2.3 Differentiate between C, C++.
- 2.4 Explain C++ I/O operation with examples.
- 2.5 Syntax of comment statements in C++.
- 2.6 List keywords of C++ other than C.
- 2.7 Explain the operation of dynamic memory allocation using new and delete operators.
- 2.8 Define function and its proto type
- 2.9 Explain the concept of Default Arguments
- 2.10 Explain the concept of function overloading.
- 2.11 Explain inline function and write its advantages.
- 2.12 Explain friend function and its use.
- 2.13 Declare and use references
- 2.14 Define a class & object in C++.
- 2.15 Declare, define, and use Class.
- 2.16 Compare classes with structures.
- 2.17 Explain Creation of objects.
- 2.18 Declare and access array of objects.
- 2.19 Explain the concept of passing objects to functions.
- 2.20 Explain the concept of returning objects from functions.
- 2.21 Declare, access pointers to objects
- 2.22 State the use of 'this' operator.

3. C++ I/O operations

- 3.1 List C++ I/O operators with their meaning.
- 3.2 Write the basics of formatted I/O.
- 3.3 Explain I/O manipulators and give examples.
- 3.4 Explain file I/O and classes of stream.h.
- 3.5 Explain the binary I/O functions like get() and put().
- 3.6 Write the format and working of file I/O functions like open(), read(), write(), count()

4. Constructors, Destructors and Operator Overloading

- 4.1 Define constructor and destructor.
- 4.2 Explain Parameterized constructors.
- 4.3 Know Multiple Constructors in a class.

- 4.4 Understand Constructors with default arguments
- 4.5 Describe Copy Constructor.
- 4.6 Describe Dynamic constructor
- 4.7 Define Destructors and develop a program to demonstrate destructors.
- 4.8 Describe Operator Overloading
- 4.9 Develop the programs for Overloading of Binary Operators
- 4.10 Develop the programs for Overloading of Unary Operators
- 4.11 Develop the programs for Overloading of Binary Operators with operator function as member and friend function
- 4.12 Develop the programs for Overloading of Unary Operators with operator function as member and friend function
- 4.13 List the rules for overloading of operators.

5. Understand derived classes and inheritance

- 5.1 State the necessity of inheritance.
- 5.2 Explain the relation between base class and derived class.
- 5.3 Know the syntax for defining a derived class
- 5.4 Explain three types of access control – public, private & protected.
- 5.5 List Types of Inheritances and explain them with examples
- 5.6 Develop a program using C++ for Single inheritance
- 5.7 Develop a program using C++ for Multi level inheritance
- 5.8 Develop a program using C++ for Multiple inheritance
- 5.9 Develop a program using C++ for Hybrid inheritance
- 5.10 Develop a program using C++ for Multipath inheritance
- 5.11 Develop a program using C++ for Hierarchical inheritance
- 5.12 Virtual base class.
- 5.13 Explain concept of virtual functions and its applications.

6. Know Templates

- 6.1 Explain the need for Templates.
- 6.2 List types of Templates.
- 6.3 Understand Function Templates
- 6.4 Develop C++ program for Templates with Single Argument Types.
- 6.5 Develop C++ program to Create function based Templates.
- 6.6 Develop C++ program for Templates with multiple argument types.
- 6.7 Use of Class Templates
- 6.8 Mention the Syntax of Class Template.
- 6.9 Develop C++ program to Create Classes based on Template.
- 6.10 Develop C++ program using Class Template for Stack Data Structure.

Suggested Activities

Student activity like mini-project, quizzes, etc. should be done in group of 5-10 students. 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.

1. Each group should conduct different activity and no repetition should occur.
2. Explore and analyse topics to improve the level of creativity and analytical skill by taking Quiz/ tests/ assignments. Documents have to be maintained as a record.
3. 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.
4. Visit different sites relevant to topics. Listen to the lectures and submit a handwritten report.
5. Coding competitions.

Suggested E-learning references

1. <https://www.tutorialspoint.com/cplusplus/index.htm>
2. <http://www.cplusplus.com/doc/tutorial/>

3. <https://www.programiz.com/cpp-programming>
4. <https://beginnersbook.com/2017/08/c-plus-plus-tutorial-for-beginners/>
5. <http://www.cplusplus.com/files/tutorial.pdf>

CO-PO Mapping Matrix

Course Outcome		CL	Linked PO	Teaching Hours
CO1	Learn the Principles of object oriented programming.	R, U	1,2,3,10	10
CO2	Develop programs using classes, objects and functions	R, U, A	1,2,3,10	10
CO3	Use C++ I/O operators, formatted I/O, I/O manipulators, file I/O, binary I/O functions, file I/O functions	R,U	1,2,3,10	14
CO4	Apply constructors, destructors and operator overloading concepts and develop associated programs.	R,U, A	1,2,3,10	06
CO5	Learn base class, derived class and types of inheritance and develop programs for different types of inheritance, virtual base class and virtual functions.	R,U, A	1,2,3,10	12
CO6	Classify templates and develop programs for types of templates.	R, U	1,2,3,10	08
		Total Sessions		60

MID SEM-I EXAM

S.No	Unit Name	R	U	A	Remarks
1	Unit-I	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-II	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	
MID SEM –II EXAM					
S.No	Unit Name	R	U	A	Remarks
1	Unit-III	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-IV	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	

Semester End Examination

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

Legend:	Remembering (R)	1 Mark
	Understanding (U)	3 Marks
	Application (A)	5 Marks

18CM402C, IV Semester

STATE BOARD OF TECHNICAL EDUCATION & TRAINING: TS: HYDERABD
18CM402C
OOP's through C++
MID EXAM - I MODEL QUESTION PAPER

Time: 1 hour Max. Marks: 20

PART-A

Note: 1. Answer All questions.
2. Each answer carries 1 mark

4X1=4 Marks

1. List any four properties of OOP's.
2. What is meant by Procedure oriented language.
3. Define class.
4. What is "this" operator?

PART-B

Note: 1. Answer any one question from each group
2. Each answer carries 3 marks

2X3=6Marks

- 5(a). Explain the benefits of OOP's.
OR
- 5(b). What is procedure oriented language?
- 6(a). Compare classes with structures.
OR
- 6(b). Explain about reference with the help of program.

PART-C

Note: 1. Answer any one question from each group
2. Each answer carries 5 marks

2X5=10Marks

- 7(a). Explain the basic components of object oriented programming.
OR
- 7(b). Explain the software crises and Software evolution.
- 8(a). Write a program in C++ to demonstrate function overloading.
OR
- 8(b). Write a program in C++ to demonstrate returning of objects from functions.

18CM402C, IV Semester

STATE BOARD OF TECHNICAL EDUCATION & TRAINING: TS: HYDERABD
18CM402C,
OOP's through C++
MID EXAM - II MODEL QUESTION PAPER

Time: 1 hour

Max. Marks:20

PART-A

Note: 1. Answer All questions.

4X1=4 Marks

2. Each answer carries 1 mark

1. Define formatted I/O.
2. Write the syntax of fopen().
3. What is copy constructor?
4. Define destructor.

PART-B

Note: 1. Answer any one question from 5 & 6.

2X3=6Marks

2. Each answer carries 3 marks

- 5(a). Write a C++ program to perform read operation from a file.
OR
- 5(b). List the C++ I/O operators with their meaning.
- 6(a). Explain about multiple constructors.
OR
- 6(b). Differentiate between constructor and destructor.

PART-C

Note: 1. Answer any one question from 7 & 8.

2X5=10Marks

2. Each answer carries 5 marks

- 7(a). Explain the Binary I/O functions get() and put().
OR
- 7(b). Explain the classes of stream.h.
- 8(a). Write a C++ program to demonstrate binary operator overloading.
OR
- 8(b). Write a C++ program to demonstrate constructor with default arguments.

C18-Semester End Examination (SEE)
Model Paper- 18CM402C (OOP's Through C++)

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

PART – A**Instructions:****8 Q X 1M = 8 Marks**

- i) Answer all the following questions:**
- ii) Each question carries one mark**

1. List the properties of OOP's.
2. What is destructor?
3. Define inheritance.
4. Write about software crisis.
5. What is hybrid inheritance?
6. What is base class?
7. Define template.
8. Write the syntax for class template.

PART – B

- Note: 1. Answer 4 questions from 9, 10, 11&12**
2. Each question carries three marks

4X 3 M = 12 Marks

- 9(a). Explain the concepts of object oriented programming.
OR
9(b). Explain about multiple inheritance.
- 10(a). Write the rules for overloading of operators.
OR
10(b). Explain the need for templates.
- 11(a). Write the relationship between base class and derived class.
OR
11(b). Write the format / syntax for defining a derived class.
- 12(a). List the types of templates.
OR
12(b). Write and explain the syntax of template.

PART – C

- Note: 1. Answer 4 questions from 13, 14, 15&16**
2. Each question carries five marks

4X 5 M = 20 Marks

- 13(a). Explain the concept of passing objects to functions.
OR
13(b). Write a C++ program to demonstrate multi path inheritance.
- 14(a). Write a C++ program to demonstrate binary operator overloading.
OR
14(b). Write a C++ program to demonstrate class template for stack data structure.
- 15(a). Write a C++ program to demonstrate multi level inheritance.
OR

15(b). Write a C++ program to demonstrate virtual function.

16(a). Write a C++ program to Create function based templates.

OR

16(b). Write a C++ program for Templates with multiple argument types.

.NET PROGRAMMING THROUGH C#

Course Title : .Net Programming through C#	Course Code : 18CM403C
Semester : IV	Course Group : Core
Teaching Scheme in Periods (L:T:P) : 3:1:0	Credits : 3
Type of Course : Communicative Language Teaching + Assignments	Total Contact Hours : 60 periods
CIE : 60 % Weightage	SEE : 40 % Weightage

Prerequisites

Basic knowledge of programming languages.

Course Outcomes

Upon completion of the course the student shall be able to

Course outcome	
CO1	Use visual studio editor for developing C#.net applications based on .net framework
CO2	Develop applications applying principles of OOPs
CO3	Develops Multithreaded application and handles runtime errors
CO4	Develops programs that supplies attributes at runtime
CO5	Develops windows and web based applications
CO6	Use database to access, store and update data through applications

Course Contents

1. Basics of .NET Framework and Visual Studio.

4 hours

Introduction to .NET Framework-features of .net framework-CLR architecture- framework and base class Library-.NET languages- Visual Studio (Integrated development environment) especially for c#.net-various windows.

2. Introduction to C#.net

13 hours

History of C#.net-Features of C#.net-Compare C#.Net V C/C++-Differences between C#.Net and Java-Primitive data types-class, struct-enum and interface-variables- local variables and methods-constructors in classes and structures-Access control specifiers in C#-Inheritance- Arrays-Method Overloading-Method Overriding- Delegates-Differentiate looping structure with recursive function call structure.

3. Exception Handling and Multithreading

5 hours

Introduction to Exception Handling- Predefined Exception Classes-Exception handling Mechanism-User define exception-Multithreading-Threads-Thread class properties and methods- Thread life cycle-Thread priorities-Inter thread communication.

4. Advanced concepts of C#

12 hours

Indexers and Properties-Anonymous Methods-Lambda expressions-Events-Operators is- as and type of-Reflection capabilities of C#-Generic Programming.

5 Windows and Web Applications development

15 hours

Various elements of user interface and their properties (text box, button, check box, radio button- list box- combo box- Enable disable hide and show the controls in the applications-Event handling Menus- Deploying and distribution of windows application-Web application and Desktop Application/Network Enabled application-Asp.net server controls with asp.net code Data transfer between pages-MVC model- Hosting web application on IIS server.

6 Database access

11 hours

Introduction to ADO.NET -Features and advantages of ADO.NET-Connection- Dataset- Data adaptor and Command objects-typed and untyped dataset objects-Data binding to DataGrid control, text box and listbox-Navigate through a data source-Introduction to LINQ-Syntax of LINQ-Types of LINQ Objects- Advantages of LINQ-Various LINQ operators

Reference Books

Professional C# 5.0 and .NET 4.5.1 (WROX)

- Christian Nagel (Author), Jay Glynn (Author), Morgan Skinner

C# 4.0 - The Complete Reference

- Herbert Schildt

C# 5.0 IN A NUTSHELL Fifth Edition

- Joseph Albahari and Ben Albahari

Specific Learning Outcomes:

Upon completion of the course the student shall be able to

1 Basics of .NET Framework and Visual Studio

- 1.1 Define .NET Framework.
- 1.2 List the features of .net framework.
- 1.3 Draw and grasp CLR architecture
- 1.4 Define about framework and base class Library.
- 1.5 List .NET languages.
- 1.6 List the features of Visual Studio (Integrated development environment) especially for c#.net.
- 1.7 Comprehend the purpose of Design View window, Code window, Object browser window, solution explorer window, server explorer window, error window and property window.

2 Introduction to C#.net

- 2.1 Familiarize with of C#.net
- 2.2 List features of C#.net
- 2.3 Differentiate between C#.Net and C/C++.
- 2.4 Differentiate between C#.Net and Java.
- 2.5 Explain Different primitive data types.
- 2.6 Build data types using class, struct, enum, and interface.
- 2.7 Design small applications using instance variables, local variables and methods
- 2.8 Write Example program with constructors in classes and structures
- 2.9 Control access to members of the class with access specifiers
- 2.10 Able to inherit class classes to develop new classes
- 2.11 Process data with different types of arrays
- 2.12 Develop programs using Method Overloading and Method Overriding concepts
- 2.13 Delegates functionality to other functions
- 2.14 Differentiate looping structure with recursive function call structure

3 Exception Handling and Multithreading

- 3.1 Define Exception.
- 3.2 List Predefined Exception Classes.
- 3.3 Handle Exceptions
- 3.4 Create user defined exception
- 3.5 Define Multithreading, Threads

- 3.6 Comprehend thread class properties and methods
- 3.7 Create and abort threads
- 3.8 List the states of thread life cycle
- 3.9 Create Multiple Threads
- 3.10 List Thread priorities
- 3.11 Develop application where threads communicate

4. Advanced concepts of C#

- 4.1 Design classes with Indexers and Properties
- 4.2 Define Anonymous Methods in classes
- 4.3 Pass Parameters and Returns values from anonymous methods
- 4.4 List types of Lambda expression with examples
- 4.5 Develop programs with events as members of a class
- 4.6 Use Operators like is, as and type of
- 4.7 Get the members of a class through Reflection capabilities in C#
- 4.8 List the needs of Generic Programming
- 4.9 Define Generic class with two parameters
- 4.10 Define Generic structures

5 Windows and Web Applications development

- 5.1 List various elements of user interface (text box, button, check box, radio button, list box, and combo box and data grid control).
- 5.2 List the properties of controls like text box, label, button, check box, radio button, combo box, list box, data grid.
- 5.3 Describe how to enable, disable, hide, and show the controls in the applications.
- 5.4 Handles events generated
- 5.5 List the steps to creation of Menus at design time using the menu design window.
- 5.6 Develop a project to control menus at run time.
- 5.7 Create short cut keys for pull down menus.
- 5.8 List the steps to deploy and distribute windows application.
- 5.9 Differentiate between web application and Desktop Application/Network Enabled application
- 5.10 Design application with asp.net server controls
- 5.11 List the importance of data transfer between pages
- 5.12 Uses query string, cookie and post method used to transfer data with example
- 5.13 Uses Session state, public properties and controls used to transfer data with example
- 5.14 Comprehend MVC model
- 5.15 List the steps to host web application on IIS server.

6 Database access

- 6.1 Familiarize with ADO.NET
- 6.2 List the features and advantages of ADO.NET.
- 6.3 Establish connection to database using Connection, Dataset, Data adaptor and Command objects
- 6.4 Differentiate typed and untyped dataset objects
- 6.5 Access data with data adapters and typed/untyped data sets.
- 6.6 Explain the process of data binding to DataGrid control, textbox and listbox
- 6.7 Explain how to navigate through a data source.
- 6.8 Familiarize to LINQ
- 6.9 Write Syntax of LINQ
- 6.10 List Types of LINQ Objects
- 6.11 List the advantages of LINQ
- 6.12 Explain various LINQ operators

Suggested Student Activities

Note:

- 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 of activity or any other similar activity related to the course with prior approval from the course coordinator and programme coordinator concerned.
 - Each group should conduct different activity and no repetition should occur.
1. Study Research Papers based on Deep learning and Machine Learning and submit a report
 2. Prepare a Power point Presentation on the applications and issues related to cloud computing and give a seminar on the same.
 3. Conduct a Quiz on C# programming language.
 4. Give a seminar on various design patterns
 5. Prepare a student database project which stores student details of CME branch.
 6. Study the impact of recent technologies on health and environment; prepare a report that addresses the issues and solution to them.
 7. Study Recent Technologies like Data Mining, Data Analysis, and Data Scientist; and write a report that distinguishes these technologies.

Suggested E-learning references

https://www.tutorialspoint.com/linq/linq_tutorial.pdf

https://sourcemaking.com/design_patterns

CO-PO Mapping Matrix

Course outcome		Linked PO	Teaching Hours
CO1	Use visual studio editor for developing C#.net applications based on .net framework.	1,2,3,4,10	4
CO2	Develop applications applying principles of OOPs	1,2,3,4,5,8,10	13
CO3	Develops Multithreaded application and handles runtime errors	1,2,3,4	5
CO4	Develops programs that supplies attributes at runtime	1,2,3,4	12
CO5	Develops windows and web based applications	1,2,3,4,5,8,10	15
CO6	Use database to access, store and update data through applications	1,2,3,4,5,8,10	11

MID SEM-I EXAM

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

MID SEM –II EXAM

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

Semester End Examination

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

Legend:	Remembering (R)	1 Mark
	Understanding (U)	3 Marks
	Application (A)	5 Marks

State Board of Technical Education
.Net Programming through C# 18CM403C
IV Semester
Mid SEM -1 Model Paper

Time: 1 hour

Marks: 20

PART-A

Instructions:

4 X 1 =4 marks

Answer all questions

Each question carries 1 mark

1. Define CLR.
2. Define MSIL.
3. Define Method overriding.
4. Write the syntax to create a structure.

PART-B

NOTE: 1. Answer any one question from 5 and 6.

2*3=6 marks

2. Each question carries three marks.

5(a). Explain and draw the architecture of CLR.

or

5(b). Explain the features of .net framework.

6(a). Write the differences between structures and class.

or

6(b). Explain different access modifiers.

PART-C

NOTE: 1. Answer any one question from 5 and 6.

2*5=10 marks

2. Each question carries three marks.

7(a). Explain the features of Visual studio IDE.

or

7(b). Explain different windows in visual Studio IDE.

8(a). Write a C# program for “multiple inheritance”.

or

8(b). Write a C# program to access the members of a structure.

State Board of Technical Education
.Net Programming through C# 18CM403C
IV Semester
Mid SEM -I1 Model Paper

Time: 1 hour

Marks : 20

PART-A

Instructions:

4 X 1 =4 marks

Answer all questions

Each question carries 1 mark

1. Write the purpose of given multiple catch with a single try block.
2. What is the class used to define user defined exception.
3. Write the syntax for lambda expression.
4. What is the use of 'is' operator.

PART-B

NOTE: 1. Answer any one question from 5 and 6.

2*3=6 marks

2. Each question carries three marks.

5(a). Explain the keyword related to exception handling.

or

5(b). Explain thread life cycle.

6(a). Explain Indexers and Properties in a class.

or

6(b). Explain the need of generic programming.

PART-C

NOTE: 1. Answer any one question from 5 and 6.

2*5=10 marks

2. Each question carries three marks.

7(a). Write a C# program where threads communicate.

or

7(b). Write a C# program to illustrate that program is not terminated when exception occurs.

8(a). Write a C# program with anonymous method that accepts arguments and return parameters.

or

8(b). Write a C# program to define a structure with generic data members.

State Board of Technical Education, Telangana State
C18-Semester End Examination (SEE)
.Net Programming through C#
18CM403C

Time: 2 Hours

Total Marks: 40

PART – A

Instructions:

8X1= 08 Marks

i) Answer all the following questions:

ii) Each question carries 1 mark

1. Write the syntax to define a constructor in a class.
2. Write the syntax to create lambda expression
3. Define Cookie.
4. Define instance and instance variable
5. Write the short cut to get the tool box?
6. What is the use of run at attribute in a server control?
7. Define data grid control.
8. List any two LINQ operators.

PART- B

NOTE: 1. Answer any one question from 9, 10, 11 and 12.

4 X 3=12 Marks

2. Each question carries three marks.

9(a) Draw and Explain CLR architecture

or

9(b) Explain five properties of TextBox and List Box

10(a) Explain the five methods of a Thread Class

or

10(b) List the features and advantages of ADO.net

11(a) Explain MVC model.

or

11(b) Differentiate between desktop application and web application

12(a) Explain different types of LINQ objects.

or

12(b) Explain Connection, Dataset and Data adaptor object.

PART-C

NOTE: 1. Answer any one question from 13, 14, 15 and 16

4 X 5=20 Marks

2. Each question carries five marks

13(a) Write following windows Object browser and solution explorer.

or

13(b) Design a C# application to sort the items in the list box

14(a) Write a C# program to solve producer consumer application

or

14(b) Write a C# program to insert a row in a table

15(a) Write a C# program to create menus at runtime

or

15(b) Write the asp.net code to create a student registration form

16(a) Write a C# code to navigate all the records in the table

or

16(b) Write a C# program to access the students records using LINQ objects

MICROPROCESSORS

Course Title	: Microprocessors	Course Code	: 18CM404C
Semester	: IV	Course Group	: Core
Teaching Scheme in Hrs (L:T:P)	: 3:1:0	Credits	: 3
Type of course	: Lecture + Assignments	Total Contact Hours	: 60 Periods
CIE	: 60 Marks	SEE	: 40 Marks

Prerequisites

Knowledge on Digital electronics and Computer Architecture.

Course Outcomes

Upon completion of the course the student shall be able to

Course Outcome	
CO1	Familiarize 8086 Microprocessor Architecture
CO2	Use 8086 instructions for assembly language programming
CO3	Describe Programmable Interrupt Controller-8259
CO4	Develop and Execute 8086 Assembly Language Programs.
CO5	Interface Parallel data Devices with 8086 Microprocessor.
CO6	Interface Serial Data Devices with 8086 Microprocessors.

Course Contents

1.0 INTRODUCTION AND ARCHITECTURE

Duration: 8 Periods

Define Micro computer, Microprocessor - how a micro computer fetches and executes an instruction - 8086 internal architecture – functional blocks of 8086 - how 8086 calculates memory addresses - Pins and signals of INTEL 8086 - Bus cycles and timing diagram.

2.0 INSTRUCTION SET OF 8086

Duration: 12 Periods

Introduction - Instruction format - Addressing modes of 8086 - Instruction execution time - Instruction affecting flags - Data transfer instructions - Arithmetic instructions - Logical instructions - String manipulation instructions - Control transfer (branching) instructions of 8086 - String manipulation instructions.

3.0 INTERRUPTS

Duration: 8 Periods

Interrupts and its classification – Interrupts of 8086 – interrupt handling process in 8086 -Programmable Interrupt controller 8259 - Assembler directives - Various assembly language development tools.

4.0 ASSEMBLY LANGUAGE PROGRAMMING

Duration: 12 Periods

Assembly language programming - executing assembly language program - examples on conditional and loop statements - Illustrating procedure CALL and RETURN, - Example programs on procedure Call.

5.0 Parallel data communication Interface and DMA controller

Duration: 10 Periods

Introduction to peripherals and interface - Parallel data transfer schemes - Programmable peripheral interface – INTEL 8255 - DMA data transfer scheme - DMA controller – INTEL 8257

6.0 Serial data communication interface and Intel advanced processors Duration: 10 Periods

Serial data communication - USART – INTEL 8251 A –Keyboard and Display controller – INTEL 8279
Comparison of 80286, 80386 and 80486 processors - Pentium Microprocessor - Architecture of Pentium Processor - Comparison of advanced Pentium processors.

Suggested Learning Outcomes:

Upon completion of the course the student shall be able to

1.0 Familiarize the architecture of 8086 microprocessor.

- 1.1 Define Micro computer and Microprocessor.
- 1.2 Describe how a micro computer fetches and executes an Instruction.
- 1.3 Explain 8086 internal architecture.
- 1.4 List registers and other parts in 8086.
- 1.5 Describe the function of each block in 8086.
- 1.6 Demonstrate how 8086 calculates memory addresses.
- 1.7 Describe the Pins and signals of 8086.
- 1.8 Illustrate the bus cycles and timing diagram of 8086.

2.0 Use the instruction set of 8086

- 2.1 Draw the generalized Instruction format of 8086.
- 2.2 Explain addressing modes of 8086 with examples.
- 2.3 Classify the Instruction set of 8086.
- 2.4 Describe the operations of selected data transfer, Arithmetic, Logical, jump, loop and string instructions.

3.0 Understand Interrupts and Assembler directives and tools

- 3.1 Define interrupt.
- 3.2 State the need of interrupt.
- 3.3 Classify the interrupts of 8086.
- 3.4 Explain the interrupt handling process in 8086.
- 3.5 Draw and describe the block diagram of Programmable interrupt controller 8259
- 3.6 Describe assembler directives.
- 3.7 Describe the use of various assembly language development tools like Editor, Assembler, Linker, Locator and Debugger.

4.0 8086 Assembly language programming

- 4.1 Defining problem, Algorithms, Flowcharts and Convert simple algorithms to assembly language programs.
- 4.2 Describe the procedure for executing an assembly language program with an assembler.
- 4.3 Execute simple assembly language programs such as addition, subtraction, Multiplication and Division.
- 4.4 Implement Conditional program structures such as IF-THEN, IF-THEN-ELSE in 8086 assembly language.
- 4.5 Implement Loop program structures such as WHILE-DO, REPEAT-UNTIL in 8086 assembly language.
- 4.6 Execute simple assembly language programs using conditional and loop Program Structures.
- 4.7 Illustrate CALL, RETURN instructions.
- 4.8 Describe how a stack is initialized and used in 8086 assembly language program which calls procedure.
- 4.9 Execute 8086 assembly language program which calls a procedure.

5.0 Parallel data communication Interface and DMA controller

- 5.1 Define peripheral.
- 5.2 State the principles of interfacing with peripherals.
- 5.3 Illustrate various parallel data transfer schemes.
- 5.4 Explain the function of programmable peripheral interface – INTEL 8255.
- 5.5 Draw and describe the block diagram of programmable peripheral interface – INTEL 8255
- 5.6 Interface 8255 with 8086.
- 5.7 Describe Direct Memory Access data transfer scheme.
- 5.8 Explain the function of DMA controller – INTEL 8257.
- 5.9 Draw and describe the Block diagram of DMA controller – INTEL 8257.
- 5.10 Interface 8257 with 8086.

6.0 Serial data communication interface and Intel advanced processors

- 6.1 Explain serial data communication
- 6.2 Explain the function of Universal Synchronous Asynchronous Receiver Transmitter– INTEL 8251A.
- 6.3 Draw and describe the Block Diagram of USART – INTEL 8251A.
- 6.4 Interface 8251A with 8086.
- 6.5 Draw and Explain Keyboard/Display controller – INTEL 8279.
- 6.6 Explain the function of 8279.
- 6.7 Interfacing 8279 with 8086
- 6.8 Compare/Contrast the features of 80286, 80386, 80486 processors.
- 6.9 Explain the architecture of Pentium microprocessor.
- 6.10 Compare/Contrast the features of advanced Pentium processors.

Suggested Student Activities

1. Student activity like mini-project, surveys, quizzes, etc. should be done in group of 5-10 students.
2. Each group should do any one of the following types 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. Explore and analyse topics to improve the level of creativity and analytical skill by taking Quiz/ tests/ assignments. Documents have to be maintained as a record.
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.
6. Visit different sites relevant to topics. Listen to the lectures and submit a handwritten report
7. Coding competitions

Recommended Books

- | | | |
|---|----|------------------------------|
| 1. Microprocessors & Interfacing | -- | Douglas V.Hall |
| 2. X86 microprocessor programming | -- | Venugopal and Rajkumar, TMH |
| 3. Advanced Microprocessors and Peripherals | -- | A K RAY, K M Bhurchandi, TMH |
| 4. Intel Microprocessors | -- | Barry B Brey |

Suggested E-learning references

1. <http://www.tutorialspoint.com/8086programming/>
2. <http://www.indiabix.com/online-test/8086-programming-test/>
3. [https://fresh2refresh.com/8086 Microprocessors/](https://fresh2refresh.com/8086-Microprocessors/)
4. <http://www.learn-8086.org/>
5. <https://www.w3schools.in/Microprocessor-tutorial/>

CO-PO Mapping Matrix

Course Outcome		CL	Linked PO	Teaching Hours
CO1	Familiarize 8086 Microprocessor Architecture	R, U, A	1,2,3,4,10	8
CO2	Use 8086 instructions for assembly language programming	R, U, A	1,2,3,4,10	12
CO3	Describe Programmable Interrupt Controller-8259	U, A	1,2,3,4,10	8
CO4	Develop and Execute 8086 Assembly Language Programs.	U, A	1,2,3,4,10	12
CO5	Interface Parallel data Devices with 8086 Microprocessor.	R, U, A	1,2,3,4,10	10
CO6	Interface Serial Data Devices with 8086 Microprocessors.	U, A	1,2,3,4,10	10
		Total Sessions		60

MID SEM-I EXAM

S.No	Unit Name	R	U	A	Remarks
1	Unit-I	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-II	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	
MID SEM –II EXAM					
S.No	Unit Name	R	U	A	Remarks
1	Unit-III	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-IV	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	

Semester End Examination

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

Legend:	Remembering (R)	1 Mark
	Understanding (U)	3 Marks
	Application (A)	5 Marks

STATE BOARD OF TECHNICAL EDUCATION & TRAINING: TS: HYDERABD
18CM404C, IV-SEM MICROPROCESSORS
MID EXAM - I MODEL QUESTION PAPER

Time: 1 hour

Max. Marks: 20

PART-A

Answer All questions. Each carries 1 mark.

4X1=4 Marks

1. Write the purpose of INTR and ALE pins of 8086
2. Define Microcomputer and Microprocessor.
3. Classify Instruction Set of 8086
4. Define Addressing Mode

PART-B

Answer TWO questions out of four questions. Each carries 3marks.

2X3=6Marks

5. a) What is bus cycle of 8086? List the bus cycles of 8086.
OR
b) Describe how a microcomputer fetches and executes an Instruction.
6. a) Explain String instructions of 8086 microprocessor
OR
b) Explain different Jump instructions of 8086 microprocessor

PART-C

Answer TWO questions out of four questions. Each carries 5 marks.

2X5=10Marks

7. a) Draw the block diagram of 8086 and explain each block
OR
b) Explain how 8086 calculates memory addresses.
8. a) Explain different Arithmetic and logical instructions of 8086
OR
b) Explain different Shift and Rotate instructions of 8086 microprocessor

STATE BOARD OF TECHNICAL EDUCATION & TRAINING:TS:HYDERABD
18CM404C, IV-SEM MICROPROCESSORS
MID EXAM - II MODEL QUESTION PAPER

Time: 1 hour

Max. Marks: 20

PART-A

Answer All questions. Each carries 1 mark.

4X1=4 Marks

1. Define Interrupt.
2. Classify Interrupts.
3. Define algorithm.
4. Write 8086 Assembly Language program to add two 8 bit Numbers.

PART-B

Answer TWO questions out of four questions. Each carries 3 marks.

2X3=6Marks

5. a) Explain the interrupt handling process in 8086.
OR
b) Describe assembler directives.
6. a) Write 8086 Assembly Language program to multiply two 8 bit Numbers.
OR
b) Describe how a stack is initialized and used in 8086 assembly language program which calls procedure.

PART-C

Answer TWO questions out of four questions. Each carries 5 marks.

2X5=10Marks

7. a) Draw and describe the block diagram of Programmable interrupt controller 8259
OR
b) Describe the use of various assembly language development tools Editor, Assembler, and Debugger.
8. a) Write an assembly language program to find sum of 'N' Natural Numbers
OR
b) Write an assembly language program to find the factorial of a number.

**C18-Semester End Examination (SEE)
Model Paper- 18CM404C (Microprocessors)**

Time: 2 Hours

Total Marks: 40

PART – A

Instructions:

8 X 1M = 8 Marks

i) Answer all the following questions:

ii) Each question carries one mark

1. Define Microcomputer and Microprocessor.
2. Define Interrupt.
3. Write the functions DMA Controller.
4. Define Addressing Mode.
5. Define peripheral?
6. List various parallel data transfer schemes.
7. Write any three differences between 80286 and 80386
8. Write the function of 8279.

PART – B

Answer 4 questions from each group

4 X 3 M = 12 Marks

9(a). Describe how a microcomputer fetches and executes an Instruction.

OR

9(b). Describe Direct Memory Access data transfer scheme.

10(a). Explain the interrupt handling process in 8086.

OR

10(b). Explain the function of USART– INTEL 8251A.

11(a). Explain the function of programmable peripheral interface – INTEL 8255.

OR

11(b). Explain Interfacing of programmable peripheral interface 8255 with 8086.

12(a). Explain Interfacing of 8251A with 8086.

OR

12(b). Explain Interfacing of 8279 with 8086

PART – C

Answer any Two questions from each group

4 X 5 M = 20 Marks

13(a). Explain different Arithmetic and logical instructions of 8086

OR

13(b). Explain Interfacing of DMA controller 8257 with 8086.

14(a). Write an assembly language program to find the factorial of a number.

OR

14(b). Explain the architecture of Pentium microprocessor.

15(a). Explain the block diagram of programmable peripheral interface – INTEL 8255

OR

15(b). Explain the Block diagram of DMA controller – INTEL 8257.

16(a). Draw and describe the Block Diagram of USART – INTEL 8251A.

OR

16(b). Draw and Explain Keyboard/Display controller – INTEL 8279.

OPERATING SYSTEMS

Course Title : Operating System	Course Code : 18CM405C
Semester : IV	Course Group : Core
Teaching Scheme in Periods (L:T:P) : 3:1:0	Credits : 3
Type of course : Lecture + Assignments	Total Contact Hours : 60 Periods
CIE : 60 Marks	SEE : 40 Marks

Prerequisites

Basic knowledge about using computer and windows operating system.

Course Outcomes

Course Outcome	
CO1	Describe operating system functions, operations and structures.
CO2	Manage process with various process scheduling algorithms.
CO3	Recognize Synchronization and handle the deadlocks with various deadlock management techniques.
CO4	Explain the memory management techniques.
CO5	Implement virtualization of memory.
CO6	Handle files using file Management techniques.

Course Contents

1. Introduction to operating systems

Duration: 08 Periods

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

2. Process management

Duration: 15 Periods

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

3. Synchronization & Deadlocks

Duration: 10 Periods

Inter Process Communications - semaphores – monitors-Deadlocks - principal of deadlock - deadlock prevention - deadlock detection - deadlock avoidance.

4. Memory management

Duration: 10 Periods

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

5. Virtual memory management

Duration: 08 Periods

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

6. Disk scheduling and File management

Duration: 09 Periods

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

Recommended Text Books

1. "Operating System", Willam Stallings, PHI.
2. "Operating System Concepts", Abraham Silberschatz, Professor, Greg Gagne, and Peter Baer Galvin.
3. "Modern operating system", Andrew S. Tanenbaum, Pearson education.

Suggested Learning Outcomes:

Upon completion of the course the student shall be able to

1.0 Introduction to operating systems

- 1.1 Define an operating system.
- 1.2 Discuss history of operating system.
- 1.3 Discuss about various types of operating systems.
- 1.4 Distinguish spooling and buffering.
- 1.5 Explain the concepts multiprogramming and timesharing.
- 1.6 Differentiate between distributed and real time systems.
- 1.7 Describe multiprocessor systems.
- 1.8 Understand the operating system components.
- 1.9 Discuss operating system services.
- 1.10 Define system call with an example.
- 1.11 List different types of system calls.
- 1.12 Define single user, multi user operating system structure.

2.0 Process management

- 2.1 Define process and process control block.
- 2.2 Understand process state diagram.
- 2.3 Describe process creation and termination.
- 2.4 Understand the relation between processes.
- 2.5 Define Thread and describe multithreading.
- 2.6 Explain scheduling concepts.
- 2.7 Describe scheduling queues and schedulers.
- 2.8 Explain CPU scheduling and scheduling criteria.
- 2.9 Explain various scheduling algorithms
 - 2.9.1 FCFS
 - 2.9.2 SJF
 - 2.9.3 Round Robin
 - 2.9.4 Priority
 - 2.9.5 Multilevel Scheduling.

3.0 Synchronization & Deadlocks

- 3.1 Describe semaphores.
- 3.2 Explain inter process communication.
- 3.3 Define Deadlock.
- 3.4 State the necessary conditions for arising deadlocks.
- 3.5 State various techniques for deadlock prevention.
- 3.6 Discuss Deadlock avoidance and detection.
- 3.7 Describe the process of recovering from deadlock.

4.0 Memory management

- 4.1 Describe briefly address binding, dynamic loading, dynamic linking.
- 4.2 Define overlays

- 4.3 Describe briefly on swapping.
- 4.4 Explain single partition allocation.
- 4.5 Explain multiple partition allocation.
- 4.6 Explain the concept of fragmentation.
- 4.7 Explain paging concept.
- 4.8 Explain how logical address is translated into physical address.
- 4.9 Explain segmentation and segmentation with paging.

5.0 Virtual memory management

- 5.1 Define virtual memory techniques.
- 5.2 Describe demand paging.
- 5.3 Describe page replacement
- 5.4 Discuss on page replacement algorithms
 - 5.4.1 FIFO
 - 5.4.2 LRU
 - 5.4.3 Optimal.
- 5.5 Explain the concept of thrashing.
- 5.6 Explain working set model and page fault frequency.

6.0 Disk scheduling and File management

- 6.1 List out various disk performance parameters
- 6.2 Disk scheduling policies
 - 6.2.1 FIFO
 - 6.2.2 SSTF
 - 6.2.3 SCAN
 - 6.2.4 C-SCAN
- 6.3 Define file management.
- 6.4 List and explain various file operations.
- 6.5 List and explain various access methods.
- 6.6 Explain directory structure organization.

Suggested Student Activities

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

- i) 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 coordinator.
- ii) Each group should conduct different activity and no repeating should occur

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. Documentation of comparing 32 bits and 64 bits OS.
8. Operating system is responsible for following activities in connection with management of memory:
 - Allocation and de-allocation of memory as and when needed.
 - Keeping track of used and unused memory space.
 - Deciding what process to be loaded into memory in case space becomes available.
9. For secondary space management:
 - Swap space and free space management
 - Disk scheduling
 - Allocating space to the data and programs onto the secondary storage device.

10. For process management:

- Creation, deletion of both user and system process.
- Handling process synchronization.
- Deadlock handling.

Suggested E-Learning References

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

Mapping Course Outcomes with Program Outcomes:

(Course Outcome linkage to Cognitive Level)

Course Outcome		CL	Linked PO	Teaching Hours
CO1	Describe operating system functions, operations and structures.	R, U	1,2,3,4,10	8
CO2	Understand process management and can implement process scheduling algorithms.	R, U,A	1,2,3,4,10	15
CO3	Recognize Synchronization and handle the deadlocks with various deadlock management techniques.	R,U, A	1,2,3,4,10	10
CO4	Explain the memory management techniques.	R, U, A	1,2,3,4,10	10
CO5	Implement virtualization of memory.	R, U, A	1,2,3,4,10	08
CO6	Handle memory disk and files using file Management techniques.	R, U, A	1,2,3,4,10	09
		Total Sessions		60

Legend: R: Remembering, U: Understanding, A: Applying

MID SEM-I EXAM

S.No	Unit Name	R	U	A	Remarks
1	Unit-I	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-II	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	
MID SEM –II EXAM					
S.No	Unit Name	R	U	A	Remarks
1	Unit-III	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-IV	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	

Semester End Examination

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

Legend:	Remembering (R)	1 Mark
	Understanding (U)	3 Marks
	Application (A)	5 Marks

MODEL QUESTION PAPER
BOARD DIPLOMA MID-SEMESTER-I EXAMINATION (C-18)
DCME-IV-SEMESTER EXAMINATION
18CM405C – Operating System

TIME: 1 HOUR

MAXIMUM MARKS: 20

PART-A

MARKS: 4 X 1=4

NOTE: 1. Answer all questions.

2. Each question carries one mark.

1. Define the term operating system.
2. What is spooling?
3. Write various states in process state diagram.
4. List out various scheduling algorithms.

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) Describe various types of operating systems.
6. (A) Give the states of process state diagram and explain it.
OR
(B) Explain the principal of 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) How an operating system can control the resources of a system.
OR
(B) Explain how multiprogramming concept will increase the performance of a system.
8. (A) How multi threading concept can reduce the execution time of a program.
OR
(B) Explain with an example priority based scheduling algorithm.

MODEL QUESTION PAPER
BOARD DIPLOMA MID-SEMESTER-II EXAMINATION (C-18)
DCME-IV-SEMESTER EXAMINATION
18CM405C – Operating System

TIME: 1 HOUR

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 shared memory concept?
4. Explain the term overlays.

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) What are the techniques used to prevent dead lock?
6. (A) What is fragmentation? Explain in detail.
OR
(B) What is segmentation? Explain segmentation with paging.

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 dead lock?
OR
(B) Explain how deadlock 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 EXAMINATION (C-18)
DCME-IV-SEMESTER EXAMINATION
18CM405C – Operating System

TIME: 2 HOUR

MAXIMUM MARKS: 40

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) Give the various conditions to occur a deadlock.
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) How files are copied on disk? Explain in detail.

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.

OOPs through C++ Lab Practice

Course Title :	OOPs through C++ lab Practice	Course Code	18CM406P
Semester	IV	Course Group	Core
Teaching Scheme in Periods(L:T:P)	1:0:2	Credits	1.5
Methodology	Lecture + Practical	Total Contact Hours :	45 Pds
CIE	60 Marks	SEE	40 Marks

Pre requisites

Knowledge of C language.

Course Outcome

Course Outcome	
CO1	Use of I/O operators, loops, Classes, objects and functions
CO2	Use of Constructors, Destructors and Operator overloading
CO3	Implement Derived classes and types of inheritance
CO4	Implement Templates

Course Contents

Unit No	Unit Name	Hours/ Periods
1	I/O operators, loops, Classes, objects and functions	13
2	Constructors, Destructors and Operator overloading	13
3	Derived classes and types of inheritance	13
4	Templates	6
	Total	45

Course outcomes

Course Outcome		CL	Linked PO	Teaching Hours
CO1	Write programs using classes, objects and functions	R, U, A	1,2,3,4,8,9,10	15
CO2	Construct programs using Constructors, Destructors and Operator overloading	R, U, A	1,2,3,4,8,9,10	15
CO3	Demonstrate Derived classes and types of Inheritance	R,U, A	1,2,3,4,8,9,10	15
CO4	Develop programs using Templates	U, A	1,2,3,4,8,9,10	10
			Total Sessions	45

Reference Books:

- | | | |
|--|---|-----------------------------|
| 1. Teach yourself C++ | - | Helbertschildt Osborne McG |
| 2. Object-oriented Programming with C++ | - | PoornachandraSarang PHI |
| 3. Programming with C++ | - | E. Balaguruswamy – TMH |
| 4. Computer Science: A Structured Approach using C++ | - | Forouzan/Gillberg - Thomson |
| 5. C++ & OOPS Paradigm | - | DebasishJana PHI |

E-References:

1. <https://www.tutorialspoint.com/cplusplus/index.htm>
2. <http://www.cplusplus.com/doc/tutorial/>
3. <https://www.programiz.com/cpp-programming>
4. <https://beginnersbook.com/2017/08/c-plus-plus-tutorial-for-beginners/>
5. <http://www.cplusplus.com/files/tutorial.pdf>

List of Experiments

- 1 Write programs using input and output operators and comments.
- 2 Write programs using if/ if – else/ nested if statement.
- 3 Write programs using loop statements – while/ do-while / for.
- 4 Write programs using arrays.
- 5 Write programs using classes & object.
- 6 Write programs using constructor and destructor.
- 7 Write programs working with two/more classes using Friend function.
- 8 Write programs using inline function.
- 9 Write a program to pass an object as a functions argument – pass object by value, pass object by reference.
- 10 Write a program to demonstrate the use of operator overloading on unary operator & binary operators like ++ operator and << operator.
- 11 Write a program to demonstrate the use of function overloading.
- 12 Write a simple program on array of objects and pointers to objects.
- 13 Write programs using new, delete with classes.
- 14 Write simple programs illustrating use of all types of inheritances.
- 15 Write a program to illustrate virtual base class.
- 16 Write a Program to illustrate virtual functions.
- 17 Write a Program to illustrate class templates.
- 18 Write a Program to illustrate function templates.

.Net Programming through C# Lab Practice

Course Title :	.Net Programming through C# Lab Practice	Course Code	18CM407P
Semester	IV	Course Group	Core
Teaching Scheme in Periods(L:T:P):	1:0:2	Credits	1.5
Methodology	Lecture + Practical	Total Contact Hours :	45 Pds
CIE	60 Marks	SEE	40 Marks

Pre requisites

This course requires the basic skills of programming.

Course Outcome

On successful completion of the course, the students will be able to attain CO:

Course outcomes

Course Outcome	
CO1	Build Programs applying OOPs concepts
CO2	Developed multithreaded applications and handles exceptions
CO3	Window and web based application development
CO4	Data Access

Course Contents

Sl. No	UNIT Name
1	Basic of C# and OOPs concepts
2	Exception handling and multi-threading
3	Window and web based application
4	Database access

Reference Books

Professional C# 5.0 and .NET 4.5.1 (WROX) -	Christian Nagel (Author), Jay Glynn (Author), Morgan Skinner
C# 4.0 - The Complete Reference -	Herbert Schildt.pdf
C# 5.0 IN A NUTSHELL Fifth Edition -	Joseph Albahari and Ben Albahari

Suggested E-learning references

https://www.tutorialspoint.com/linq/linq_tutorial.pdf

Mapping outcomes with program outcomes

(Course outcome linkage to cognitive learning)

Course Outcome		CL	Linked PO	Teaching Hours
CO1	Build Programs applying OOPs concepts	U/A	1,2,3,4,8,10	11
CO2	Developed multithreaded applications and handles exceptions	U/A	1,2,3,4,8,10	11
CO3	Window and web based application development	U/A	1,2,3,4,8,10	11
CO4	Data Access	A	1,2,3,4,8,10	12
			TOTAL	45

List of Experiments

1. C# Program to Check Whether the Entered Year is a Leap Year or Not
2. C# Program to Display the Date in Various Formats
3. C# Program to Compare Two Dates
4. C# Program to Display the ATM Transaction
5. C# Program to Generate Random Numbers
6. C# Program to Illustrate the Use of Access Specifiers
7. C# Program to Implement PhoneBook
8. C# Program to Implement for-each in Interface
9. C# Program to Calculate Acceleration
10. C# Program to Demonstrate Multilevel Inheritance
11. C# Program to Illustrate Single Inheritance
12. C# Program to Illustrate Hierarchical Inheritance
13. C# Program to Illustrate Multilevel Inheritance with Virtual Methods
14. C# Program to Display Cost of a Rectangle Plot Using Inheritance
15. C# Program to Demonstrate IndexOutOfRangeException Exception
16. C# Program to Demonstrate DivideByZero Exception
17. C# Program to Illustrate Exception Handling for Invalid TypeCasting in Boxing
18. C# Program to Demonstrate Multiple Exceptions
19. C# Program to Demonstrate Exception Handling for Stack Overflow
20. C# Program to Illustrate NullReference Exception
21. C# program to find the positive number in the array using LINQ

Microprocessors Lab practice

Course Title :	Microprocessors Lab Practice	Course Code	18CM408P
Semester	IV	Course Group	Core
Teaching Scheme in Periods(L:T:P)	1:0:2	Credits	1.5
Methodology	Lecture + Practical	Total Contact Hours :	45Pds
CIE	60 Marks	SEE	40 Marks

Pre requisites

Knowledge of Computer Operation.

Course outcomes

Course Outcome		CL	Linked PO	Teaching Hours
CO1	Write programs using Data Transfer Instructions and Arithmetic Instructions	R, U, A	1,2,3,4,8,9,10	10
CO2	Write Programs using Logical, Shift and Rotate Instructions	R, U, A	1,2,3,4,8,9,10	5
CO3	Write Programs using Branching Instructions	R,U, A	1,2,3,4,8,9,10	20
CO4	Write Programs using CALL and RET Instructions	U, A	1,2,3,4,8,9,10	10
			Total Sessions	45

Legends: R = Remember U= Understand; A= Apply and above levels (Bloom's revised taxonomy)

List of Experiments

1. Execute an assembly language program for the addition of two 8 bit Numbers and two 16 bit Numbers
2. Execute an assembly language program for the Subtraction of two 8 bit Numbers and two 16 bit Numbers
3. Execute an assembly language program for Multiplication of two 8 bit Numbers and two 16 bit Numbers
4. Execute an assembly language program for Division of 16 bit Number by 8 bit Number
5. Execute an assembly language program to add two BCD numbers.
6. Execute an assembly language program to find reverse of a given number
7. Execute an assembly language program to find the factorial of a number.
8. Execute an assembly language program to count number of ones and zeros in a number.
9. Execute an assembly language program to find sum of 'N' numbers given in an array.
10. Execute an assembly language program to find sum of 'N' Natural Numbers
11. Execute an assembly language program to find the Smallest among 'N' Numbers.
12. Execute an assembly language program to implement searching on an array.
13. Execute an assembly language program to manipulate strings.
14. Execute an assembly language program to implement pattern matching.
15. Execute an assembly language program to move data from one location to another location.
16. Execute a program for generating multiplication table for a given number
17. Execute an assembly language program to sort the numbers in ascending order.
18. Execute an assembly language program to sort the numbers in descending order.

Suggested Student Activities

Student activity like mini-project, quizzes, etc. should be done in group of 5-10 students.

1. 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.
2. Each group should conduct different activity and no repetition should occur.
3. Visit different web sites relevant to topics. Listen to the lectures and submit a handwritten report
4. Coding competitions

Web Designing Lab practice

Course Title :	Web Designing Lab Practice	Course Code	18CM409P
Semester	IV	Course Group	Core
Teaching Scheme in Periods(L:T:P)	1:0:2	Credits	1.5
Methodology	Lecture + Practical	Total Contact Hours :	45Pds
CIE	60 Marks	SEE	40 Marks

Pre requisites

Knowledge of Computer Operation.

Course Content and Blue Print of Marks for SEE

Unit No	Unit name	Hours/ Periods	Marks for SEE			Marks weight age	%Weightage
			Coding	Compilation	Execution		
1	Web Designing	45	20	10	10	40	100
	Total	45	40			40	100

Course outcomes

Course Outcome		CL	Linked PO	Teaching Hours
CO1	Write programs using HTML and XML	R, U, A	1,2,3,4,8,9,10	10
CO2	Write Programs using Java Script	R, U, A	1,2,3,4,8,9,10	15
CO3	Write Programs using PHP	R,U, A	1,2,3,4,8,9,10	20
			Total Sessions	45

Legends: R = Remember U= Understand; A= Apply and above levels

List of Experiments

- Create a HTML page that uses the tags like head, title, body etc.
- Create a HTML page that uses frames and different presentation formats, colors.
- Create a HTML page with a table consisting of a header, body and footer.
- Create a HTML page with a form containing various controls.
- Create a style sheet to set the background color, position and dimensions of a HTML element.
- Create a simple XML file that contains student data.
- Develop JavaScript code using arithmetic operators.
- Develop JavaScript code to implement sorting.
- Develop JavaScript code that uses recursion.
- Develop JavaScript code that displays date in various formats.
- Develop PHP program using arithmetic operators.
- Develop PHP program to implement searching.
- Develop PHP program to perform various operations on a database table using functions.
- Develop a PHP program to set a cookie.

Suggested Student Activities

Student activity like mini-project, quizzes, etc. should be done in group of 5-10 students.

1. 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.
2. Each group should conduct different activity and no repetition should occur.
3. Visit different web sites relevant to topics. Listen to the lectures and submit a handwritten report
4. Coding competitions

Advanced Communication Skills and Life Skills

Course Title	Advanced Communication Skills and Life Skills	Course Code	18 Common 410 P
Semester	IV	Course Group	Foundation
Teaching Scheme in Periods- L:T:P	1:0:2	Credits	1.5
Methodology	Lecture + Practical	Total Contact Hours	45 Periods (3 Periods per Week)
CIE	60 Marks	SEE	40 Marks

Rationale:

This course is designed to impart writing skills and employability skills to the students of diploma which will help them in obtaining and maintaining the employment.

Prerequisites:

This course requires the basic knowledge of vocabulary, grammar and four language learning skills, viz. Listening, Speaking, Reading and Writing.

Course Outcomes:

Modules	At the end of the course the students will have the ability to:
Presentation Skills	Prepare a presentation. Use presentation aids effectively. Develop public speaking skills. Learn to make PowerPoint Presentations effectively. Present a Paper using appropriate body language.
Writing Reports	Learn kinds of reports. Learn the format of a report. Organize ideas.

	Develop essential vocabulary useful to write scientific and technical reports.
Interview Skills	Learn the techniques to face an interview. Learn the etiquette to communicate with employers. Learn the dos and don'ts of an interview. Learn the frequently asked questions in interviews. Use appropriate body language. Learn to face interviews telephonically. Gain the confidence to face an interview by attending mock interview.
Group Discussion	Learn the dos and don'ts of a Group Discussion. Participate in a Group Discussion in a healthy manner. Use effective non-verbal communication. Use appropriate phrases and expressions useful in a group discussion.
Workplace Awareness	Learn workplace etiquette. Identify the knowledge, skills and attributes useful at workplace. Build strong workplace relationships. Learn professional ethics. Understand gender equality at the workplace Develop a sense of responsibility towards the society.

Writing Skills Useful at Workplace	Learn various writing formats useful at workplace. Develop an ability to apply technical information in documentation. Revise and edit written documents effectively. Develop corresponding skills - learn the kinds of business letters - the format of a business letter. Learn effective e-mail writing skills. Learn Business Memos. Learn Notes and Narratives. Learn Forms and Applications. Prepare templates for different purposes. Prepare an agenda of a meeting. Prepare the minutes of a meeting. Prepare Notices / Circulars for various purposes. Prepare Press release.

CO-PO Matrix

	Course Outcome		Linked PO
CO 1	Making effective presentations	R/U/A	1, 2, 3,4, 5,6,7,8,9,10
CO 2	Writing scientific and technical reports	R/U/A	1,2,3,4, 5,6,7,8,9,10
CO 3	Learn to face oral and telephonic interviews	R/U/A	1,2,3,4, 7,9,
CO 4	Learn to face group discussion	R/U/A	1,2,3,7,8,9
CO 5	Learn to write various formats useful at workplace	R/U/A	1,2,3,5,7,8,9,10
CO6	Learn workplace etiquette and ethics	R/U/A	1,2,3,7,8,9,10

Course Contents:

I. Presentation Skills	Duration: 6 periods
II. Writing Reports	Duration: 9 periods
III. Interview Skills	Duration: 9 periods
IV. Group Discussion	Duration: 6 periods
V. Workplace Awareness	Duration: 6 periods
VI. Writing Skills Useful at Workplace	Duration: 9 periods

Suggested Student Activities:

- Paper Presentations
- Seminars
- Mock Interviews
- Telephonic Interviews
- Group Discussions
- Role Plays
- Creating advertisements
- Five-minute activities
- Creating a model of workplace

Evaluation Pattern:

I. Continuous Internal Examination: 60 Marks

- a. **Mid Sem - I** 20 marks
Syllabus:
 - i. Presentation Skills
 - ii. Writing Reports
- b. **Mid – II:** 20 Marks
Syllabus:
 - i. Interview Skills
 - ii. Group Discussion
- c. **Internal assessment:** 20 marks
 - i. Seminars: 10 marks
 - ii. Assignments: 5 marks
 - iii. Lab record submission: 5 marks

II. Semester End Examination : 40 Marks

- a. Write an essay on a given topic or participate in an activity: 15 Marks
- b. Interview or Group Discussion: 15 Marks
- c. Viva Voce 10 marks

References:

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

E-Learning Resources:

1. <http://www.dailywritingtips.com/>
2. <http://www.englishdaily626.com/c-errors.php>
3. <http://www.owl.net.rice.edu/~cainproj/>
4. <http://www.thehumorsource.com/>
5. <http://www.indiabix.com/group-discussion/topics-with-answers/>
6. <http://networketiquette.net/>
7. <https://public.wsu.edu/~brians/errors>
8. <http://www.bbc.co.uk/worldservice/learningenglish/radio/specials/15>

BOARD DIPLOMA EXAMINATION (C-18)
FOURTH SEMESTER COMMON-410P
ADVANCED COMMUNICATION SKILLS AND LIFE SKILLS

MID SEM - I

Time : 1 Hour

Total Marks: 20 Marks

Part – A

10 marks

Instruction: Answer any one of the following questions.

1. Write the guidelines for preparing a PowerPoint presentation.
2. How do you prepare yourself for presenting a technical paper?
3. Mention a few presentation aids and how do you use them effectively?

Part – B

10 marks

Instruction: Answer any one of the following questions.

4. Write the format of a report and describe it.
5. Write a report on the accident you have seen recently.
6. Give the outline of a project report and describe it.

BOARD DIPLOMA EXAMINATION (C-18)
FOURTH SEMESTER COMMON-410P
ADVANCED COMMUNICATION SKILLS AND LIFE SKILLS

MID SEM - II

Time : 1 Hour

Total Marks: 20 Marks

Part – A

10 marks

Instruction: Answer any one of the following questions.

1. What are the dos and don'ts for a formal interview?
2. What at least ten frequently asked questions in a formal interview?
3. How do you prepare for a telephonic interview?

Part – B

10 marks

Instruction: Answer any one of the following questions.

4. What are the dos and don'ts of a group discussion?
5. Mention some phrases and expressions commonly used in a group discussion.
6. Write a short paragraph on the steps you take while participating in a group discussion.

BOARD DIPLOMA EXAMINATION (C-18)
FOURTH SEMESTER 18 COMMON-410P
ADVANCED COMMUNICATION SKILLS AND LIFE SKILLS
SEMESTER END EXAM

Time: 3 Hours

Total Marks: 40 Marks

Part – A

10 marks

Instruction: Pick any one question from the given lot.

1. Prepare the outline of a project report and describe it.
2. Write the guidelines for preparing the slides of a PowerPoint presentation.
3. Write the minutes of the meeting conducted at the Principal's chamber to conduct the annual day celebrations. Prepare the agenda of the annual day celebrations.
4. Describe the workplace etiquette.
5. Prepare a press note for the '*Job Mela*' which is going to be conducted at your institute.

Part – B

15 marks

6. Interview / Group Discussion

Part – C

15 marks

7. *Viva Voce*

SKILL UPGRADATION-IV

Course Title	: Skill Upgradation-IV	Course Code	: Common
Semester	: IV	Course	: Core
Teaching Scheme in periods	: 0:0:7	Credits	: 2.5
Methodology	: Activities	Total	: 105
CIE	: Rubrics	Contact SEE	: Nil

Rationale: This course is introduced for all semesters with a purpose of providing outside classroom experiences that lead to overall development of the students. One whole day is allocated for activities.

Course Objective:

1. To create an awareness on Engineering Ethics and Human Values.
2. To instill Moral, Social Values and Loyalty.
3. Create awareness about social responsibilities of Engineers
4. To improve Communication and Participation skills

Course Content and Blue Print of Marks for SEE			
Activity No	Activity	Periods	Frequency
1	Haritha Haram(plantation & Maintenance)/ Waste management /Swachh Bharat	21	7 times in a semester
2	Mini projects	18	6 times in a semester
3	Online Video Tutorials/ MOOCs in SWAYAM /NPTEL/ e-Journals	16	4 times in a semester
4	Seminars/Quizzes/ Technical Paper Presentations /Group discussions/ Participate in Tech fests and coding competitions	24	6 times in a semester
5	Field Visits/Field Practice(also within the campus)	14	2 times
6	Expert/Guest Lectures • Safety and Responsibilities of an Engineer • Occupational crime/Cyber crimes • Responsibility of engineers • Emerging technologies	12	4 Times
Total Periods		105	

Note: in case Expert faculties are not available English faculty may handle the expert lectures or Video clips on the suggested lectures may be played and the suggested activities are flexible.

Course Outcomes

CO	Outcome	CO/PO Mapping
CO1	Practice the moral values that ought to guide the Engineering profession.	1,2,5,6,7,8,9,10
CO2	Develop the set of justified moral principles of obligation, ideals that ought to be endorsed by the engineers and apply them in real life situations	8,10
CO3	Create awareness of saving environment through activities	3,4,5,8,9
CO4	Create awareness of Constitution of India	1,4,7,8,9,10

COURSE CONTENT:

SAFETY, RESPONSIBILITIES OF ENGINEERS

Safety and risk-definition- - assessment of safety and risk - risk benefit analysis and reducing risk—Personal risk-Public risk-Reducing risk-Voluntary Risk-Collegiality and loyalty–Authority- Types- collective bargaining - occupational crime –Responsibility of engineers–Types-Social responsibility-Professional responsibility-confidentiality-conflicts of interest-liability

Evaluation:

The student must maintain a record of all activities conducted on **skill upgradation/ Activities** day and prepare a soft copy of report and submit it to their mentor or upload to the institute website or mail.

The reports shall be evaluated by the mentors through rubrics and accordingly give the eligibility for 2.5 credits. The student must have participated in at least 75% of activities to get eligibility.

CO-PO Mapping Matrix											
	Basic knowledge	Discipline Knowledge	Experiments and practice	Engineering Tools	Engineer and society	Environment & sustainability	Ethics	Individual and Team work	Communication	Lifelong learning	Mapped PO
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	
CO1	✓				✓					✓	5,10
CO2					✓					✓	5,10
CO3						✓	✓		✓	✓	6,7,9,10
CO4					✓		✓			✓	5,7,10

FORMAT FOR STUDENT ACTIVITY ASSESSMENT

DIMENSION	Unsatisfactory 1	Developing 2	Satisfactory 3	Good 4	Exemplary 5	Score
Collection of Data	Does not collect any information relating to the topic	Collects very limited information; some relate to the topic	Collects some basic information; refer to the topic	Collects relevant information; concerned to the topic	Collects a great deal of information; all refer to the topic	2
Fulfill team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties	Performs nearly all duties	Performs all duties	Performs all duties of assigned team roles with presentation	4
Shares work equally	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Does the assigned job without having to be reminded.	Always does the assigned work without having to be reminded and on given time frame	2
Listen to other team mates	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Listens, but sometimes talk too much	Listens and contributes to the relevant topic	Listens and contributes precisely to the relevant topic and exhibit leadership qualities	2
					TOTAL	10/4=2.5

**All student activities should be done in a group of 4-5 students with a team leader.*

NOTE: This is only an example. Appropriate rubrics may be devised by the concerned course co-ordinator for assessing the given activity.

If the average score is greater than 1(>1), then 2.5 credits will be awarded to student.