

**PDM UNIVERSITY**  
**BACHELOR OF COMPUTER APPLICATIONS**

**PROGRAM SCHEME**

**SEMESTER – I**

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C
COAP1101	BCA	PC	COMPUTER FUNDAMENTAL AND PROGRAMMING	3	1	0	3.5
COAP1102	BCA	PC	PROGRAMMING WITH C	4	0	0	4
COAP1103	BCA	PC	PROGRAMMING WITH C LAB	0	0	4	2
COAP1104	BCA	PC	PC SOFTWARE	4	0	0	4
COAP1105	BCA	PC	PC SOFTWARE LAB	0	0	4	2
MATH0112	G		MATHEMATICS	4	0	0	4
ECEN0103	G		INTRODUCTION TO DIGITAL ELECTRONICS	4	0	0	4
MGMT0101	M		MANAGEMENT & PROFESSIONAL LEADERSHIP	3	0	0	3
<b>TOTAL CREDITS</b>				<b>22</b>	<b>1</b>	<b>08</b>	<b>26.5</b>

**L = Lecture**

**T = Tutorial**

**P = Practical**

**C = Credit Point**

Category	
<b>G</b>	General
<b>BCA</b>	Bachelor of Computer Applications
<b>M</b>	Management

Sub Category	
<b>PC</b>	Program Core

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**SEMESTER – I**

**COMPUTER FUNDAMENTAL AND PROGRAMMING**

**L T P**  
**3 1 0**

MODULE CODE	<b>COAP1101</b>
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

A study of the subject matter presented in this course will enable the student to become familiar with:

1. Fundamental of computer system
2. Working of operating system
3. Various types of virus
4. Nature of networking

**LEARNING OUTCOMES:**

This is an elementary course in computers and information technology. Upon completion of this course the student should be able to:

1. Discuss the evolution of computers in different generations.
2. Classify computers in different categories based on their capabilities.
3. Describe the major components of computers and information technology applications: Hardware, software, data, processes, computer networks and people.
4. Demonstrate an understanding of the importance of algorithms in the development of IT applications.

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**MODULE CONTENT:**

<p><u>UNIT-I: Computer Fundamentals</u> Generations of Computers, Definition, Block Diagram along with its components, characteristics &amp; classification of computers, Limitations of Computers, Human-Being VS Computer, Applications of computers in various fields. Memory: Concept of primary &amp; secondary memory, RAM, ROM, types of ROM.</p>
<p><u>UNIT-II: Computer Hardware &amp; Software</u> I/O devices, definition of software, relationship between hardware and software, types of software.</p>
<p><u>UNIT-III: Flowcharts</u> Flowchart: Definition, Define, symbols of flowchart, Advantages and disadvantages, Examples.</p>
<p><u>UNIT-IV: Overview of Operating System</u> Definition, functions of operating system, concept of multiprogramming, multitasking, multiprocessing, time-sharing, real time, single-user &amp; multi-user operating system.</p>
<p><u>UNIT-V: Overview of Networking</u> An introduction to computer networking, Network types (LAN, WAN, MAN), Network topologies, Modes of data transmission, Forms of data transmission, Transmission channels (media).</p>
<p><u>UNIT-VI: Introduction to Internet</u> Uses of internet, Applications of internet, Hardware and Software requirements for internet, Intranet, Applications of intranet.</p>

**RECOMMENDED BOOKS:**

<p><b>TEXT BOOKS</b></p>	<ol style="list-style-type: none"><li>1. Computing Fundamentals and Programming in C by Gill Nasib Singh, Khanna Books Publishing Co., New Delhi.</li><li>2. Computing Fundamentals and C Programming by Balagurusamy E, Tata McGraw Hill.</li><li>3. Fundamental of Computers by P. K. Sinha, B.P.B. Publications.</li></ol>
<p><b>REFERENCEBOOKS</b></p>	<ol style="list-style-type: none"><li>1. Application of IT to Business by Chhillar, Rajender Singh, Ramesh Publishers, Jaipur.</li><li>2. Fundamental of Computers by V. Rajaraman, B.P.B. Publications.</li></ol>

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**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for theory.

**Theory:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	2	05
2.	Sessional Test	2	20
3.	Group Discussion	2	05
4.	End Semester Exam	1	70

**MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES**

**Theory:**

Assessments	1	2	3	4
Class Test	x	x		
Quiz	x		x	
Assignment	x		x	x

**MAPPING OF COURSE LEARNING OUTCOMES**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1		3	4						2

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**EVALUATION**

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

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**PROGRAMMING WITH C**

**L T P**  
4 0 0

MODULE CODE	<b>COAP1102</b>
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

This course aims to familiarize the trainee with basic concepts of computer programming and developer tools and teach students how to design, write and Execute a Program in ‘C’.

1. To teach the behavior of basic Data types, Control Structures and Various Programming techniques.
2. To understand and analyze a Problem and then try to write the C-Codes to solve the problem.
3. To make students familiar with basic Computer Programming Array, Pointers, Functions & File Handling in C
4. To present the syntax and semantics of the “C” language as well as data types offered by the language help the students to write their own programs using standard language infrastructure regardless of the hardware or software platform

**LEARNING OUTCOMES:**

1. Design an algorithmic solution for a given problem
2. Write a maintainable C program for a given algorithm.
3. Trace the given C program manually and Write C program for simple applications of real life using Functions, Arrays, Pointers, Structures and Files.
4. Trace out the error and resolve it using debugging and develop the logical and analytical thinking.

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**MODULE CONTENT:**

Unit-I: Introduction

C character set Identifiers and keywords, Data types, constants, variables and arrays; declarations, expressions statements, symbolic constants, compound statements, arithmetic operators, unary operator, relational and logical operators, assignment operators, conditional operators, bit operators. C constructs, If statement; if...else statement; if....else if...else statement, while statement and do...while statement, for statement, switch statement, nested control statement, break and continue keyword, comma operator, go to statement , Typecast and its operators.

Unit-II: Functions

Functions, why? How to declare, define and invoke a function Variables' scope, local variables and function parameters, Pointers, arrays and structures as function parameters, Calling of a Function, Function result and return statement, Functions Parameters, Parameterizing the main function, Header files and their role.

Unit-III: Arrays

Arrays, How to declare and use an array in C, Initiators: a simple way to set an array, the meaning of array indexing, different types of an array(One- Dimensional, two dimensional), Arrays of arrays and multidimensional arrays, Void type, Arrays of pointers vs. multidimensional arrays, Structures – why? Declaring, using and initializing structures Pointers to structures and arrays of structures, Basics of recursive data collections .

Unit-IV: Pointers, Macros &Memory Management in C

Pointers: another kind of data in “C” An address, a reference, a dereference and the sizeof operator, Simple pointer and pointer to nothing (NULL) & operator, value at (\*) and address of (and) operator, pointer to pointer, Pointers arithmetic, Pointers vs. arrays, Using strings: basics , Basic functions dedicated to string manipulation pointer to arrays; array of pointers; pointers to functions; array of pointers to functions; Pre-processor directives: #include; #define; macro’s with arguments; the operators # and ##; conditional compilations; multiple file programming. Memory management and structures, Memory allocation and deallocation: malloc() and free() functions.

Unit-V: Structures and unions and Storage Classes in C

Structures; Unions; structure passing to functions. Structures – why? Declaring, using and initializing structures, Pointers to structures and arrays of structures, Basics of recursive data collections. *Storage classes:* Automatic; external (global); static and Registers.

Unit-VI: File handling

FILE structure, Opening and closing a stream, Open modes, Read Modes, Write Modes, Reading and writing to/from a stream, Predefined streams: stdin, stdout and stderr, Stream manipulation: fgetc(), fputc(), fgets() and fputs() functions Raw input/output: fread() and fwrite() functions

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**RECOMMENDED BOOKS:**

<b>TEXT BOOKS</b>	<ol style="list-style-type: none"><li>1. Peter Norton, 2006, "Introduction to Computers", Sixth Edition, Tata McGraw Hill Publication,</li><li>2. E. Balaguruswamy, 2002, "Programming in ANSI C", Third edition, Tata McGraw Hill Publications,</li><li>3. Yaswant Kanetkar, "Let us C ", BPB Publications: 14<sup>th</sup> edition.</li></ol>
<b>REFERENCEBOOKS</b>	<ol style="list-style-type: none"><li>1. Programming with C by Bryon's Gottfried, Tata Mcgraw Hill.</li><li>2. The C Programming 2<sup>nd</sup> Edition, By Brian W Kernigham and Dennis M Ritchie", PHI.</li></ol>

**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for theory.

**Theory:**

<b>Assessment #</b>	<b>Type Of Assessment</b>	<b>Per Semester</b>	<b>Maximum Mark</b>
1.	Class Test	2	05
2.	Sessional Test	2	20
3.	Group Discussion	2	05
4.	End Semester Exam	1	70

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**MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES**

**Theory:**

<b>Assessments</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Class Test	x	x	x	x
Quiz	x	x		
Assignment	x	x	x	x

**MAPPING OF COURSE LEARNING OUTCOMES**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1,2,4	1,3,4	3,4		1,3		4			

**EVALUATION**

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

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**PROGRAMMING WITH C LAB**

**L T P**  
**0 0 4**

MODULE CODE	<b>COAP1103</b>
CREDIT POINTS	2
FORMATIVE ASSESSMENT MARKS	30
SUMMATIVE ASSESSMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**OBJECTIVES**

1. To understand the Programming skills and develop the Program.
2. To understand the Structure, flow and Working of a C Program.
3. To develop analyzing and problem solving skills and use the same for writing programs in C.
4. To familiarize the trainee with basic concepts of computer programming and developer tools.
5. To present the syntax and semantics of the “C” language as well as data types offered by the language.
6. To allow the trainee to write their own programs using standard language infrastructure regardless of the hardware or software platform

**LEARNING OUTCOMES**

Following this course, students will be able to:

1. Do the Compilation and develop the Software using C Program.
2. Deal with the basic scalar data types and their operators.
3. Know and Implement the Flow control.
4. Understand and Implement the Complex data types: arrays, structures and pointers.
5. Structuring the code: functions and modules.
6. Do the Preprocessing of Source Code.

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**LIST OF EXPERIMENTS**

1.	Write a C Program to check if a given number is Odd or even.
2.	Write a C Program to reverse a number and check whether it is palindrome or not.
3.	Write a C Program to compute Sum of Digit in a given Number.
4.	Write a C Program to find whether a given number is Prime or Not.
5.	To write a C Program, Using Switch to Implement Simple Calculator (ADD, MIN, DIV, MUL).
6.	To write a C program to illustrate Call by Value and Call by Reference.
7.	To write a C Program to Find Factorial of a Number using Recursion.
8.	To write a C program to check whether a given string is palindrome or not.
9.	To write a C program for to read two strings and concatenate the Strings.
10.	To write a C Program to implement the following Pointer Concept: a) Pointer to Pointer b) Pointer to Structure. c) Pointer to Function.
11.	Using Array, write a C Program to Implement the transpose of a Matrix.
12.	Using Array, write a C Program to Implement the Multiplication of a Matrix.
13.	Using Structure in C, write a Program to create the record of 10 students consisting of Name, Age, Address & their marks In Percentage.
14.	To write a C program to Create a file and store the Information.
15.	To write a C program to illustrate reading of Data from a File.
<b>Experiments based on advanced topics:</b>	
16.	To implement all the above concept: 1. Develop a Minor Project for Hotel Management System
17.	To implement all the above concept: 1. Develop a Minor Project for Library Management System

**Note: At least 12 Experiments out of the list must be done in the semester.**

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**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for practical.

**Practical:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	30
2	External Assessment	1	70

**MAPPING OF COURSE LEARNING OUTCOMES**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1,2,4	1,3,4	3,4		1,3		4			

**EVALUATION**

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

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**PC SOFTWARE**

**L T P**  
**4 0 0**

MODULE CODE	<b>COAP1104</b>
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

A study of the subject matter presented in this course will enable the student to become familiar with:

1. Make student aware of MS-Word.
2. Acquire knowledge on MS-Excel.
3. Get familiar with the concepts of MS-Powerpoint.
4. Enable learner to understand MS-Access

**LEARNING OUTCOMES:**

On successful completion of this module, students should be able to:

1. Practical knowledge and use of the Windows operating system.
2. Creating word documents for office use.
3. Formatting techniques and presentation styles.
4. Knowledge of mail merge.
5. Use of Basic functions and formulas.
6. Using excel workbooks and templates.

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**MODULE CONTENT:**

UNIT-I: Ms-Windows

Basics of Windows. Basic components of windows; icons; types of icons; taskbar; activating windows; using desktop; title bar; running applications; exploring computer; managing files and folders.

UNIT-II: Copying and moving files and folders

Control panel – display properties; adding and removing software and hardware; setting date and time; screensaver and appearance.

UNIT-III: Documentation Using MS-Word

Introduction to word processing interface, Toolbars, Menus, Creating & Editing Document, Formatting Document, Finding and replacing text, Format painter, Header and footer, Drop cap, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Previewing and printing document, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

UNIT-IV: Electronic Spread Sheet using MS-Excel

Introduction to MS-Excel, Cell, cell address, Creating & Editing Worksheet, Formatting and Essential Operations, Moving and copying data in excel, Header and footer, Formulas and Functions, Charts, Cell referencing, Page setup, Macros, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation, Database Management using Excel-Sorting, Filtering, Validation, What if analysis with Goal Seek, Conditional formatting.

UNIT-V: Presenation using Ms Powerpoint

Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect

UNIT-VI: Ms Access

Introduction to databases, Introduction to objects, Getting started in Access, Working with tables, Modifying tables, Working with Forms, Sorting and Filtering records, Designing a query, Creating reports, Advanced report options..

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**RECOMMENDED BOOKS:**

<b>TEXT BOOKS</b>	<ol style="list-style-type: none"> <li>1. Microsoft Office Complete Reference: Jennifer Kettell, Guy Hart-Davis and Curt Simmons McGraw Hill, New York</li> <li>2. Learn Microsoft Office: Russell A Stultz B P B Publications, New Delhi</li> </ol>
<b>REFERENCEBOOKS</b>	<ol style="list-style-type: none"> <li>1. Microsoft Office 2000 Courter: Gini Courter and Annette Marquis Sybex Inc; Hoboken United States</li> <li>2. Microsoft Office XP Fast and Easy: Diane Koers Prentice Hall of India, Patparganj Industrial State, Delhi</li> <li>3. Office XP: The Complete Reference: Julia Kelly and Stephen L Nelson Tata McGraw Hill, India</li> </ol>

**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for theory.

**Theory:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	2	05
2.	Sessional Test	2	20
3.	Group Discussion	2	05
4.	End Semester Exam	1	70

**MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES**

**Theory:**

Assessments	1	2	3	4	5	6
Class Test	x	x			x	x
Quiz	x		x			x
Assignment	x		x	x		

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**MAPPING OF COURSE LEARNING OUTCOMES**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1		3	4			5	6		2

**EVALUATION**

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

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**PC SOFTWARE LAB**

**L T P**  
**0 0 4**

MODULE CODE	<b>COAP1105</b>
CREDIT POINTS	2
FORMATIVE ASSESSMENT MARKS	30
SUMMATIVE ASSESSMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**OBJECTIVES:**

A study of the subject matter presented in this course will enable the student to become familiar with:

1. Make student aware of MS-Word.
2. Acquire knowledge on MS-Excel.
3. Get familiar with the concepts of MS-Powerpoint.
4. Enable learner to understand MS-Access

**LEARNING OUTCOMES:**

On successful completion of this module, students should be able to:

1. Practical knowledge and use of the Windows operating system.
2. Creating word documents for office use.
3. Formatting techniques and presentation styles.
4. Knowledge of mail merge.
5. Use of Basic functions and formulas.
6. Using excel workbooks and templates.

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**LIST OF EXPERIMENTS**

1.	How to Create, Edit and Format documents in MS Word.
2.	How to insert Header and footer in MS Word.
3.	How to use Drop Cap Spelling and Grammar tool in MS Word.
4.	How to make Macro in MS Word.
5.	How to use Mail Merge in MS Word.
6.	How to Creating and editing worksheet in MS Excel
7.	How to use Formula and functions in MS Excel
8.	How to create Charts, pivot chart and pivot table in MS Excel
9.	Database management-sorting, filtering, validation, conditional formatting in MS Excel
10.	MS Powerpoint <ul style="list-style-type: none"><li>• Manipulating and enhancing slides</li><li>• Word art</li><li>• Animations and sounds</li><li>• Sound effect</li></ul>
11.	Working with tables in MS Access
12.	Working with forms in MS Access
13.	Designing a query in MS Access
14.	Creating reports in MS Access
<b>Experiments based on advanced topics:</b>	
15.	To implement all the above concept: 1. Develop a Minor Project for your college.

**Note: At least 14 Experiments out of the list must be done in the semester.**

**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

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**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for practical.

**Practical:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	30
2	External Assessment	1	70

**MAPPING OF COURSE LEARNING OUTCOMES**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1,2,4	1,3,4	3,4		1,3		4			

**EVALUATION**

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

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**MATHEMATICS**

**L T P**  
4 0 0

MODULE CODE	<b>MATH0112</b>
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

A study of the subject matter presented in this course will enable the student to become familiar with:

1. Basic set theory, relations and functions
2. Basis of determinants and matrices
3. How to solve simultaneous equations using determinants and matrix theory
4. Limits and continuity, differentiation and integration.

**LEARNING OUTCOMES:**

On successful completion of this module, students should be able to:

1. Students will understand how to use limits to compute the derivative of a function.
2. Students will be able to utilize methods of integration.
3. Students will become skilled in computations and applications of matrices to solve industrial problems.
4. Solve problems using mathematics in unfamiliar settings.
5. Solve applied problems using differentiation and integration.

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**MODULE CONTENT:**

<p><u>Unit I: Matrices</u> Definition; Types of Matrices; Addition; Subtraction; Scalar Multiplication and Multiplication of Matrices; Adjoint; Inverse; Determinates: Definition; Minors; Cofactors; Properties of Determinants. Solving simultaneous linear equations using matrices and Determinants.</p>
<p><u>Unit II: Sets</u> Sets; Subsets; Equal Sets Universal Sets; Finite and Infinite Sets; Operation on Sets; Union; Intersection and Complements of Sets; Cartesian Product; Cardinality of Set; Simple Applications.</p>
<p><u>Unit III: Relations and functions</u> Properties of Relations; Equivalence Relation; Partial Order Relation Function: Domain and Range; Onto; Into and One to One Functions; Composite and Inverse Functions.</p>
<p><u>Unit IV: Limits and continuity</u> Limit at a Point; Properties of Limit; Computation of Limits of various types of functions; Continuity at a Point; Continuity over an Interval; Type of Discontinuities</p>
<p><u>Unit V: Differentiation</u> Derivative; Derivatives of Sum; Differences; Product and Quotients; Chain Rule; Derivatives of Composite Functions; Logarithmic Differentiation; Rolle's Theorem; Mean Value Theorem; L' Hospitals Rule; Maxima and Minima.</p>
<p><u>Unit VI: Integration</u> Integral as Limit of Sum; Riemann Sum; Fundamental Theorem of Calculus; Indefinite Integrals; Methods of Integration Substitution; By Parts; Partial Fractions; Integration of Algebraic and Transcendental Functions;.</p>

**RECOMMENDED BOOKS**

<b>TEXT BOOK</b>	<ol style="list-style-type: none"> <li>Advanced Engineering Mathematic by Reyszig Erwin, John Wiley and Sons Ohio State University Columbus, Ohio.</li> <li>Elementary Engineering Mathematics by Dr B S Grewal, Khanna Publications, New Delhi.</li> </ol>
<b>REFERENCE BOOK</b>	<ol style="list-style-type: none"> <li>Advanced Engineering Mathematics by H K Dass, S Chand and Sons, New Delhi.</li> <li>Integral Calculus by Shanti and Narayan, S Chand and Company, New Delhi.</li> <li>Differential Caluculs by Shanti and Narayan, S Chand and Company, New Delhi.</li> </ol>

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**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

**ASSESSMENT METHODOLOGIES**

This subject will be evaluated for a total of 100 marks.

**Theory:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	2	05
2.	Sessional Test	2	20
3.	Group Discussion	2	05
4.	End Semester Exam	1	70

**MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES**

Assessments	1	2	3	4	5
Class Test	x	x	x	x	
Quiz	x	x			
Assignment	x	x		x	

**MAPPING OF COURSE LEARNING OUTCOMES**

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	3,5	2	1		4						

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**EVALUATION**

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

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**INTRODUCTION TO DIGITAL ELECTRONICS**

**L T P**  
4 0 0

MODULE CODE	<b>ECEN0103</b>
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

This course aims at providing insight and knowledge about architectures and protocols for mobile and wireless communication.

1. To acquire foundation knowledge for Digital Electronics.
2. To get knowledge about the number system.
3. To get better inside of binary logic circuit and k-maps.
4. To evaluate circuit designs within the context of digital and combinational circuits.

**LEARNING OUTCOMES:**

1. Understand the basic concepts of digital electronics.
2. Understand number system.
3. Learn Boolean algebra, Boolean Theorems and K-maps.
4. Introduction to circuit design, basic gate design.
5. Learn to design combinational and digital circuits.

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**MODULE CONTENT:**

<p><u>UNIT-I: Information Representation</u> Number Systems(decimal ,binary,octal and hexadecimal number system)</p>
<p><u>UNIT-II: Binary Logic</u> Binary Arithmetic (addition , subtraction multiplication and division) Fixed-point and Floating point representation of numbers, BCD Codes,</p>
<p><u>UNIT-II: Error –Detection Code</u> Error detecting and correcting codes, Character Representation – ASCII, EBCDIC, Unicode Boolean Algebra, Boolean Theorems, Boolean Functions and Truth Tables,</p>
<p><u>UNIT-III: Boolean Algebra &amp; Digital Logic</u> Canonical and Standard forms of Boolean functions, Simplification of Boolean Functions – Venn Diagram, Karnaugh Maps .Introduction to digital signals, Basic Gates – AND, OR, NOT, UniversalGates and their implementation – NAND, NOR, Other Gates – XOR, XNOR etc. NAND,NOR, AND-OR-INVERT and OR-AND-INVERT implementations of digital circuits,</p>
<p><u>UNIT-V: Combinational Circuits-I</u> Encoders, Decoders, Multiplexers, Demultiplexers, Comparators, Code Converters, BCD to Seven-Segment Decoder.</p>
<p><u>UNIT-VI: Combinational Circuits-II</u> Encoders , Decoders, Multiplexers, Demultiplexers, Comparators, Code Converters, BCD to Seven-Segment Decoder</p>

**RECOMMENDED BOOKS:**

<b>TEXT BOOKS</b>	<p>1.M. Morris Mano, “Digital Logic and Computer Design”, Prentice Hall of India Pvt. Ltd.</p>
<b>REFERENCEBOOKS</b>	<p>1. Nicholas Carter, “Schaum’s Outlines Computer Architecture”, Tata McGraw-Hill</p> <p>2. V. Rajaraman, T. Radhakrishnan, “An Introduction to Digital Computer Design”, Prentice Hall of India Pvt. Ltd.</p> <p>3. Andrew S. Tanenbaum, “Structured Computer Organization”, Prentice Hall of India Pvt. Ltd.</p> <p>4. Gill, Nasib Singh and Dixit J.B.: “Digital Design and Computer Organization”,University Science Press (Laxmi Publications), New Delhi.</p>



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**EVALUATION**

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

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**MANAGEMENT & PROFESSIONAL LEADERSHIP**

**L T P**  
3 0 0

MODULE CODE	<b>MGMT0101</b>
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

The aim of this subject is to teach students how to design, write, and analyse the financial data of a firm or a company. It will also enable students to learn the complete accounting process.

1. To provide knowledge and understanding of the basics of management.
2. To develop an understanding of leadership and its styles.
3. To make them understand the role of planning, organizing and decision making to lead the organization.
4. To identify value of group involvement and team building.
5. To make them understand the role of communication to lead the organization.
6. To provide an understanding of role of motivation to lead in the organization.

**LEARNING OUTCOMES**

Following this course student will be able to:

1. Develop an understanding of the process of management in the organizations and to apply that process for effective utilization of resources.
2. Develop an understanding of role of leadership in the organizations.
3. Acquaint themselves to apply leadership styles and theories as it relates to management practices.
4. Identify value of motivation, emotional intelligence and stability in resolving organizational problems.
5. Develop an understanding of communication and its role to the organization.
6. Analyse group formations, work team and team building strategies of the organization.

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**MODULE CONTENT**

<u>Unit I: Management–introduction</u> Nature and functions of management, principles of management, levels of management, management as an art, management as science and profession, management process, managerial skills and roles; Evolution of Management Thoughts; Managerial competencies.
<u>Unit II:: Basic concepts of Leadership</u> Leadership: Functions of leaders, styles of leadership , leadership theories- Trait theory, Behavioral Theory
<u>Unit III: Planning, Organizing and Decision making</u> Planning- process of planning, elements of planning; steps in Organizing , authority and responsibility , delegation, centralization vs. decentralization; decision making, rationality in decision making.
<u>Unit IV:: Team Development</u> Work team , nature of work teams, types of team, stages of team development, role of leadership in team development.
<u>UNIT-V: Communication</u> Communication: Communication process, importance of communication, communication channels, Roles and barriers to communication.
<u>Unit VI: Motivation</u> Motivation: Process and motivation models/approaches; relevance of motivation theories in Business.

**RECOMMENDED BOOKS**

<b>TEXT BOOK</b>	<ol style="list-style-type: none"><li>1. Fundamentals of Management by Robbins, S.P. and Decenzo, D.A Pearson Education Asia, New Delhi</li><li>2. Organizational Behaviour by F Luthan’s, Tata McGraw Hill, New Delhi</li></ol>
<b>REFERENCE</b>	<ol style="list-style-type: none"><li>1. Organizational behaviour by S P Robbins, Prentice Hall of India, New Delhi</li><li>2. Essentials of management by Chhabra T.N. , Sun India publications</li></ol>

**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

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**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for Theory.

**Theory:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	2	05
2.	Sessional Test	2	20
3.	Group Discussion	2	05
4.	End Semester Exam	1	70

**MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES**

**Theory:**

Assessments	1	2	3	4	5	6
Class Test	x			x		
Quiz			x			x
Assignment	x	x		x		x

**MAPPING OF COURSE LEARNING OUTCOMES**

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1,2		3			5		4	6	

**EVALUATION**

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

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**PROGRAM SCHEME**

**SEMESTER – II**

MODULE CODE	CATEGORY	SUB CATEGORY	MODULE	L	T	P	C
COAP1106	BCA	PC	INTRODUCTION TO WEB TECHNOLOGIES	4	0	0	4
COAP1107	BCA	PC	WEB TECHNOLOGIES LAB	0	0	4	2
COAP1108	BCA	PC	OBJECT ORIENTED LANGUAGE USING C++	4	0	0	4
COAP1109	BCA	PC	C++ LAB	0	0	4	2
COAP1110	BCA	PC	DATABASE MANAGEMENT SYSTEM	4	0	0	4
COAP1111	BCA	PC	DATABASE MANAGEMENT SYSTEM LAB	0	0	4	2
COAP1112	BCA	PC	COMPUTER ARCHITECTURE	4	0	0	4
	BCA	PE	ELECTIVE-I*	3	1	0	3.5
VALU0115	P	SE	PROFESSIONAL COMMUNICATION-I	0	0	2	1
<b>TOTAL CREDITS</b>				<b>19</b>	<b>1</b>	<b>4</b>	<b>26.5</b>

**ELECTIVES**

L = Lecture  
T = Tutorial  
P = Practical  
C = Credit  
Point

MODULE CODE	ELECTIVE-I*
COAP1213	MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE
COAP1214	SYSTEM PROGRAMMING
COAP1215	SYSTEM ANALYSIS AND DESIGN

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**SEMESTER – II**

**INTRODUCTION TO WEB TECHNOLOGIES**

**L T P**  
4 0 0

MODULE CODE	<b>COAP1106</b>
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

The aim of this subject is to provide basic knowledge of Internet and will enable the student to become familiar with: Internet and its working, HTML, DHTML, Style Sheets and Scripting Language and to make them understand:

5. The importance of the web as a medium of communication.
6. Understand the principles of creating an effective web page, including an in-depth consideration of information architecture.
7. Become familiar with graphic design principles that relate to web design and learn how to implement these theories into practice.
8. Learn the language of the web: HTML and CSS..

**LEARNING OUTCOMES:**

On successful completion of this module, students should be able to:

1. Understand and analyze internet and their applications
2. Work with HTML & DHTML.
3. Design websites, animation & web scripting.
4. Understand the need of WWW.
5. Working with scripting languages such as JAVASCRIPT & VBSCRIPT.
6. Where , why and how to use style sheets such as CSS and JSS

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**MODULE CONTENT:**

<p><u>Unit I: Introduction to Internet</u> About internet and World Wide Web; Evolution and History of World Wide Web, Basic features.</p>
<p><u>Unit II: Basic features</u> Web Browsers; Web Servers; <i>Email, Web Portal, Domain Names</i>, Hypertext Transfer Protocol; Overview of TCP/IP and its services; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools.</p>
<p><u>Unit III: Web publishing</u> Hosting your Site; Internet Service Provider; Web terminologies; Phases of Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names; Front page views; Adding pictures; Links; Backgrounds; Relating Front Page to DHTML. Creating a Website and the Markup Languages.</p>
<p><u>Unit IV: Web development</u> Introduction to HTML; Hypertext and HTML; HTML Document features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring, <i>HTML Comments, Anchor Tag, Adding images and sound</i></p>
<p><u>Unit V: Text colours and background</u> Formatting text; Page layouts; Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes.</p>
<p><u>Unit VI: DHTML, Style sheets and Scripting</u> Dynamic HTML; Features of DHTML; Document Object model, DHTML events. Introduction to JAVASCRIPT : Data types, Control Statements, Operators, builtin and UserDefined functions, Objects in JAVASCRIPT, Handling Events. Cascading Style Sheets : Types of Style Sheets- Internal, Inline and External, Creating Style Sheets, Link Tag</p>

**RECOMMENDED BOOKS**

<b>TEXT BOOK</b>	<p>1. Internet and Web Technologies: Raj Kamal Tata McGraw Hill, New Delhi 2. Multimedia and Web Technology: Ramesh Bangia Firewall Media, New Delhi</p>
<b>REFERENCE BOOK</b>	<p>1. Web Design: The Complete Reference; Thomas A. Powell Tata McGraw Hill, New Delhi 2. HTML Beginners Guide: Wendy Willard Tata McGraw Hill, New Delhi 3. Internet and World Wide Web-How to Program: Deitel and Goldberg Prentice Hall of India, Delhi</p>

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**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

**ASSESSMENT METHODOLOGIES**

This subject will be evaluated for a total of 100 marks.

**Theory:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	2	05
2.	Sessional Test	2	20
3.	Group Discussion	2	05
4.	End Semester Exam	1	70

**MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES**

Assessments	1	2	3	4	5	6
Class Test	x	x	x	x		
Quiz	x	x			x	x
Assignment	x	x		x		x

**MAPPING OF COURSE LEARNING OUTCOMES**

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	3,5	2	1		4		3,6		4,5		6

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**EVALUATION**

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
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**WEB TECHNOLOGIES LAB**

**L T P**  
**0 0 4**

MODULE CODE	<b>COAP1107</b>
CREDIT POINTS	2
FORMATIVE ASSESSMENT MARKS	30
SUMMATIVE ASSESSMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**OBJECTIVES**

The objective of this lab is to

1. Dynamic Web pages creation.
2. The basics of sites creation using language HTML.
3. To develop an ability to design and implement static and dynamic website.

**LEARNING OUTCOMES**

Following this course, students will be able to:

1. knows basic internet technologies
2. Cascading Style Sheets.
3. use internet technologies for building sites.
4. Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.

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**LIST OF EXPERIMENTS**

1.	Design a HTML page to illustrate body tag and all its attributes.
2.	Design a HTML page to illustrate font tag.
3.	Design a HTML page to illustrate DIV tag.
4.	Design a HTML page to illustrate text formatting tags(<b>,<i>,<u>,<subscript>,<superscript>,<em>,<s>,<code>,<big>,<small>,<strong>)etc
5.	Design a HTML page to illustrate ordered list tag.
6.	Design a HTML page to illustrate unordered list tag.
7.	Design a HTML page to illustrate definition list tag.
8.	Design a HTML page to illustrate the image tag with all its alignment.
9.	Design a HTML page to illustrate table tag.
10.	Design a HTML page to illustrate the form tag.
11.	Design a HTML page to illustrate the frame tag.
12.	Design a HTML page to illustrate anchor tag for hyperlink for both image and text.
13.	Design a HTML page to illustrate the span tag and quote tag.
14.	Design a HTML page to illustrate the CSS .
15.	Design a HTML page to make a Calculator using JAVASCRIPT.
<b>Experiments based on advanced topics:</b>	
16.	Design a Website of college using HTML,DHTML,CSS and JAVASCRIPT.

**Note: At least 12 Experiments out of the list must be done in the semester.**

**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

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**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for practical.

**Practical:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	30
2	External Assessment	1	70

**MAPPING OF COURSE LEARNING OUTCOMES**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1,2,4	1,3,4	3,4		1,3		4			

**EVALUATION**

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
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**OBJECT ORIENTED LANGUAGE USING C++**

**L T P**

**4 0 0**

MODULE CODE	<b>COAP1108</b>
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

A study of the subject matter presented in this course will enable the student to become familiar with:

1. Programming concepts and techniques.
2. Object oriented language Concepts.
3. C++ language syntax.
4. Control statements, loops, functions, and arrays.
5. File Handling
6. Write programs for a wide variety problems in math, science, financials, and games

**LEARNING OUTCOMES:**

Upon completion of this course the student should be able to:

1. Analyze and design strategies for solving basic programming problems.
2. Use primitive data types, selection statements, loops, functions to write programs.
3. Use of Pointers and Inheritance.
4. Use the step-wise refinement approach.
5. Use arrays to store, process, and sort data.

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**MODULE CONTENT:**

<p><u>Unit I: Introduction</u></p> <p>Object oriented programming approach; characteristics of object orientated languages; Bridging C and C++ (Overview of C Concepts).</p> <p>Structures and Unions: Declaration of structures; Accessing structure members; Structure Initialization; Arrays of structure; nested structures; structure with pointers; functions and structures; Unions; Structure/Union Versus Class in C++.</p> <p>Class Declaration: Data Members; Member Functions; Private and Public Members; Data Hiding and Encapsulation; Array within a class.</p>
<p><u>Unit II: Class function definition</u></p> <p>Member Function definition inside the class and outside the class; Friend Function; Inline Function; Static Members and Functions; Scope Resolution Operator; Private and Public Member Functions; Nesting of Member Functions. Creating Objects; Accessing class data members; Accessing member functions; Arrays of Objects; Objects as function arguments: Pass by value; Pass by reference; Pointers to Objects.</p>
<p><u>Unit III: Constructors and Destructors</u></p> <p>Declaration and Definition; Default Constructors; Parameterized Constructors; Constructor Overloading; Copy Constructors. Destructors: Definition and use.</p>
<p><u>Unit IV: Inheritance</u></p> <p>Extending Classes Concept of inheritance; Base class; Derived class; Defining derived classes; Visibility modes: Private; public; protected; Single inheritance : Privately derived; Publicly derived; Making a protected member inheritable; Access Control to private and protected members by member functions of a derived class; Multilevel inheritance; Nesting of classes.</p>
<p><u>Unit V: Function overloading and operator overloading</u></p> <p>Binary and Unary. Polymorphism: Definition; early Binding; Polymorphism with pointers; Virtual Functions; late binding; pure virtual functions.</p>
<p><u>Unit VI: Input/output files</u></p> <p>Exception Handling; Template; Streams and files, Namespaces, the basic Streamclasses : C++ predefined streams.</p>

**RECOMMENDED BOOKS:**

<b>TEXT BOOKS</b>	<ol style="list-style-type: none"> <li>Object Oriented Programming with C++ ; E Balagurusami; Tata McGraw Hill; New Delhi</li> <li>Object Oriented Programming in Turbo C++; Robert Lafore ; Galgotia Publications; Delhi</li> </ol>
<b>REFERENCEBOOKS</b>	<ol style="list-style-type: none"> <li>The C++ Programming Language ; Bjarna Stroustrup ; Addison-Wesley Publishing Company; UK</li> <li>Object Oriented Programming Using C++; Salaria R S ;Khanna Book; New Delhi.</li> </ol>

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**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for theory.

**Theory:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	2	05
2.	Sessional Test	2	20
3.	Group Discussion	2	05
4.	End Semester Exam	1	70

**MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES**

**Theory:**

Assessments	1	2	3	4	5
Class Test	x	x			x
Quiz	x		x		
Assignment	x		x	x	x

**MAPPING OF COURSE LEARNING OUTCOMES**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1		3	4			4,5			2

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**EVALUATION**

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
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**C++ LAB**

**L T P**  
0 0 4

MODULE CODE	<b>COAP1109</b>
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**OBJECTIVES:**

This course aims to familiarize the students with basic concepts of computer programming and developer tools and teach students how to design, write and Execute a Program in ‘C++’.

5. To teach the behavior of basic Data types, Control Structures and Various Programming techniques.
6. To understand and analyze a Problem and then try to write the C++-Codes to solve the problem.
7. To learn the characteristics of an object oriented language: data abstraction and information hiding, inheritance and dynamic binding of the messages to the methods.
8. To learn how inheritance, virtual functions and templates are used.

**LEARNING OUTCOMES:**

5. To understand how C++ improves C with object-oriented features.
6. To learn how to implement copy constructors and class member functions.
7. To understand the concept of data abstraction and encapsulation.
8. To learn how to overload functions and operators in C++.
9. To learn how inheritance and virtual functions implement dynamic binding with polymorphism.
10. To learn how to design and implement generic classes and exception handling with C++.

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**LIST OF EXPERIMENTS**

1.	Write a program to print "Hello World"
2.	WAP Find out sum of all digit of a given number. Write a program addition of n even number.
3.	WAP to simple calculator using switch case.
4.	Write a program to Swap the contents of two variable Using call by value and Call by reference.
5.	Write a program to implement function overloading to calculate volume of different shapes using default and constant arguments.
6.	Write a program to overload unary operator ++ and --.
7.	Define Class EMPLOYEE with static member function having name, salary, height.
8.	Write a program to create various types of constructors and destructors for the class. <ul style="list-style-type: none"><li>• Use default constructor to get numbers from user and display average.</li><li>• Use parameterized constructor to display date.</li><li>• Use copy constructor and print value of object four times.</li><li>• Use dynamic constructor to calculate interest of amount.</li></ul>
9.	WAP to calculate the average value of the given number using friend function.
10.	Write a program for single level inheritance for class STUDENT to read and display marks of three subjects for each student.
11.	Write a program to create a class STUDENT, SUB, RESULT for multilevel inheritance for student to read marks and display final result.
12.	WAP to create class STUDENT, SUB , SPORTS, RESULT for multiple inheritance for student to read marks of subjects and sports class and display final result for both.
13.	WAP to demonstrate the concept of virtual base class.
17.	WAP to calculate the hexa and octal value of the given no using virtual function.
18.	WAP to Use of I/O stream classes <ul style="list-style-type: none"><li>• Use of get() and put()</li><li>• Use of getline() and write().</li></ul>
19.	WAP to use of manipulators setw(), setfill(), setprecision().
20.	WAP to use of Exception Handling
21.	WAP to use of class template and function template

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**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for practical.

**Practical:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Internal Assessment	2	30
2.	External Assessment	1	70

**MAPPING OF COURSE LEARNING OUTCOMES**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1,2,4	1,3,4	3,4		1,3		4	5		6

**EVALUATION**

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

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**DATA BASE MANAGEMENT SYSTEM**

**L T P**  
4 0 0

MODULE CODE	<b>COAP1110</b>
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

A study in detail about the Fundamentals of Database Management Systems, Various models of Database and its related application.

1. To teach the Data Base System Architecture along with Data Independence.
2. To understand and analyze Normalization and its different forms.
3. To make students familiar with basic Queries for Developing Data Base & do various Operations onto it.
4. To teach the implementation DBMS S/W so that they can work on Data Base for their needs.
5. To make students familiar with advanced data Base system for the use of Trigger, Procedure, and Cursors & Functions.

**LEARNING OUTCOMES:**

Upon successful completion of the course, a student will be able to:

1. Understand the database concepts, different database models, and database management systems & understand the database development processes and activities.
2. Understand relational database theory and be able to use a relational database management system.
3. Understand Data Modelling concepts and their application in design and development process.
4. Apply proper techniques, such as normalization, in designing a database and to use advanced SQL to create, manipulate, and query database of a typical enterprise
5. Use several commercially available database management systems such as Access and Oracle SQL Plus.

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**MODULE CONTENT:**

Unit-I: Introduction to DBMS

File System vs. DBMS – Views of data – Data Models – Database Management System Services – Overall System Architecture – Database Users, Characteristics of the Database Approach, and Different people behind DBMS, Implications of Database Approach and Advantages of using DBMS, When not to use a DBMS. Database System Concepts, Data Models, Schemas, and Instances. DBMS Architecture and Data Independence, Database languages and interfaces. The database system Environment, Classification of DBMS.

Unit-II: Relational Models

Data Dictionary – Entity – Relationship (E-R) – Enhanced Entity – Relationship Model. Relational Model – Relational Data Structure – Relational Data Integrity – Domain Constraints – Entity Integrity – Referential Integrity – Operational Constraints – keys – Relational Algebra – Fundamental operations – Additional Operations

Unit-III: Relational Database Language

Data definition in SQL – Basic Structure - Queries based on DML & DDL in SQL – Insert, Modification of the database, Delete and Update Statements in SQL, – Set operations – Aggregate Functions – Null values – Nested Sub queries – Derived Relations – Views in SQL — Joined Relations, Specifying General Constraints as Assertions, specifying indexes, Embedded SQL. PL /SQL: Introduction — Function, Procedure, Package, Cursor & Triggers.

Unit-IV: Normalization and file Organization

Functional Dependencies, Pitfalls in Relational Database Design ,Decomposition ,Normalization using Functional Dependencies, Normalization using Multi-valued Dependencies, Normalization using Join Dependencies, Domain-Key, Normal form. Overview of Physical Storage Media – Magnetic Disks – RAID – Tertiary storage – File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing .

Unit-V: Query Processing Overview

Estimation of Query Processing Cost- Join strategies – Transaction Processing -- Transaction Support in SQL – Concepts and States – Implementation of Atomicity and Durability – Concurrent Executions –Concurrency control – Lock Based Protocols – Timestamp Based Protocols .

Unit-VI: Data Base Recovery & its techniques

Schedules and Recoverability, Serializability of Schedules, Locking Techniques for Concurrency Control, Concurrency Control based on time stamp ordering. Distributed Databases – Data Storage – Network Transparency – Transaction Model – Commit Protocols – Coordinator selection – Object Oriented Databases – Object Oriented Data Model.

**RECOMMENDED BOOKS**

**TEXT BOOK**

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, “Database System Concepts”, Fourth Edition, Tata McGraw Hill, 2002.
2. Remez Elmasri and Shamkant B. Navathe, “Fundamentals of Database Systems”, 5 th Edition, Pearson Education, 2007.



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**EVALUATION**

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

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**DATA BASE MANAGEMENT SYSTEM LAB**

**L T P**  
**0 0 4**

MODULE CODE	<b>COAP1111</b>
CREDIT POINTS	2
FORMATIVE ASSESSMENT MARKS	30
SUMMATIVE ASSESSMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**OBJECTIVES**

1. To understand the Programming skills and develop the Program.
2. To present SQL and procedural interfaces to SQL comprehensively.
3. To give an introduction to systematic database design approaches covering conceptual design, logical design and an overview of physical design
4. To present the concepts and techniques relating to query processing by SQL engines

**LEARNING OUTCOMES**

Following this course, students will be able to:

1. Understand, appreciate and effectively explain the underlying concepts of database technologies.
2. Design and implement a database schema for a given problem-domain.
3. Normalize a database
4. Populate and query a database using SQL DML/DDDL commands.
5. Programming PL/SQL including stored procedures, stored functions, cursors, packages.

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**LIST OF EXPERIMENTS**

1.	<b>Queries Based on DDL</b>
2.	<b>Queries Based on DML</b>
3.	<b>Queries Based on DCL</b>
4.	<b>Queries Based on SQL JOINS</b>
5.	<b>Queries Based on SQL Functions</b>
6.	<b>Queries to Create/Drop a View in SQL.</b>
<b>Experiments based on advanced topics:</b>	
7.	<b>PL/SQL Program to find radius of a circle and result get stored into the Database.</b>
8.	<b>PL/SQL Program to Create Function &amp; how it can be used in our Program.</b>
9.	<b>PL/SQL Program to Create Cursor &amp; how it can be used in our Program.</b>
10.	<b>PL/SQL Program to Create Procedure &amp; how it can be used in our Program.</b>
11.	<b>PL/SQL Program to Create Trigger &amp; how it can be used in our Program.</b>

**Note: At least 10 Experiments out of the list must be done in the semester.**

**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

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**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for practical.

**Practical:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	50
2	External Assessment	1	50

**MAPPING OF COURSE LEARNING OUTCOMES**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1,2,4	1,3,4	3,4		1,3		4			

**EVALUATION**

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
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**COMPUTER ARCHITECTURE**

**L T P**

**4 0 0**

MODULE CODE	<b>COAP1112</b>
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

A study of the subject matter presented in this course will enable the students to become familiar with:

1. Basic Computer Organization.
2. Advanced pipelining techniques.
3. Input-Output and Memory Organization.
4. Micro-programmed Control Unit and Central Processing Unit

**LEARNING OUTCOMES:**

On successful completion of this module, students should be able to:

1. Working of DMA.
2. Know about the various addressing modes used by any instruction.
3. Pipelining and vector processing.
4. Register transfer and instruction execution cycle.

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**MODULE CONTENT:**

<p><u>Unit I: Basic computer organization and design</u> Instruction codes, computer registers, computer instructions, timing and control, instruction cycle, memory reference instructions, input-output and interrupts, design of basic computer, design of accumulator logic.</p>
<p><u>Unit II: Register transfer and micro-operation</u> Register transfer language, register transfer, bus and memory transfer, arithmetic micro-operations, logic micro-operations, shift micro-operations.</p>
<p><u>Unit III: Micro-programmed control unit and central processing unit</u> Micro-programmed Control Unit: Control memory, address sequencing; Central Processing Unit: Introduction, general register organization, stack organization, instruction formats, addressing modes.</p>
<p><u>Unit IV: Pipeline and vector processing</u> Parallel Processing, pipelining, arithmetic pipeline, RISC Pipeline, Vector Processing, Array Processors.</p>
<p><u>Unit IV: Input-Output organization and memory organization</u> Peripheral devices, input-output interface, asynchronous data transfer, modes of data transfer, priority interrupt, direct memory access, input-output processor, Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual memory, memory management hardware.</p>
<p><u>Unit VI: Multiprocessors</u> Characteristics of multiprocessor, Interconnection Structure, Interprocessor Communication and Synchronization.</p>

**RECOMMENDED BOOKS:**

<b>TEXT BOOKS</b>	<p>1.Computer System and Architecture :Mano M Pearson, New Delhi</p> <p>2.Computer Organization and Architecture :Stallings W Prentice Hall of India, New Delhi</p>
<b>REFERENCEBOOKS</b>	<p>1.Digital Computer Electronics: An Introduction to Microcomputers :Malvino McGraw Hill, New York</p>

**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

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**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for theory.

**Theory:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	2	05
2.	Sessional Test	2	20
3.	Group Discussion	2	05
4.	End Semester Exam	1	70

**MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES**

**Theory:**

Assessments	1	2	3	4
Class Test	x	x	x	
Quiz	x			x
Assignment	x	x	x	x

**MAPPING OF COURSE LEARNING OUTCOMES**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1,2,4	1,3,4	3,4		1,3		4			4

**EVALUATION**

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

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**MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE**

**L T P**  
**3 1 0**

MODULE CODE	<b>COAP1213</b>
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

A study of the subject matter presented in this course will enable the student to become familiar with:

1. variation of algorithm
2. tree techniques
3. number system
4. various of central tendency

**LEARNING OUTCOMES:**

On successful completion of this module, students should be able to:

1. apply mathematical foundations to the discipline of computer science.
2. understand the theoretical and practical significance of computational theory and its application to important real-world problem domains.
3. use, implement and compare fundamental abstract data types.
4. analyze the complexity and computability of algorithmic solutions.
5. determine the correctness and efficiency of the design of a software system.

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**MODULE CONTENT:**

<u>Unit I: Algorithm</u>
Algorithms; merits and demerits; Exponentiation; How to compute fast exponentiation. Linear Search; Binary Search; "Big Oh" notation; Worst case; Advantage of logarithmic algorithms over linear algorithms; complexity.
<u>Unit II: Graph theory</u>
Graphs; Types of graphs; degree of vertex; sub graph; isomorphic and homeomorphic graphs; Adjacent and incidence matrices; Path Circuit ; Eulerian; Hamiltonian path circuit. Trees; Minimum distance trees; Minimum weight and Minimum distance spanning trees.
<u>Unit III: Recursion</u>
Recursively defined function. Merge sort; Insertion sort; Bubble sort; and Decimal to Binary.
<u>Unit IV: Recurrence relations</u>
LHRR; LHRRWCCs; DCRR. Recursive procedures
<u>Unit V: Number theory</u>
Principle of Mathematical induction; GCD; Euclidean algorithm; Fibonacci numbers; congruences and equivalence relations; public key encryption schemes.
<u>Unit VI: Basic statistics</u>
Measure of Central Tendency; Preparing frequency distribution table; Mean; Mode; Median; Measure of Dispersion: Range; Variance and Standard Deviations; Correlation and Regression.

**RECOMMENDED BOOKS:**

<b>TEXT BOOKS</b>	<ol style="list-style-type: none"> <li>1.Fundamentals of Applied statistics; Gupta S P ,Kapoor and V K ; Sultan Chand and Sons; New Delhi</li> <li>2.Introduction to Statistics; Graybil1 Tata McGraw Hill; New Delhi</li> </ol>
<b>REFERENCEBOOKS</b>	<ol style="list-style-type: none"> <li>1.Statistical Modelling; Anderson Tata McGraw Hill, New Delhi</li> <li>2.Discrete Mathematics; Babu Ram Pearson Education India, New Delhi.</li> </ol>

**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

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**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for theory.

**Theory:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	2	05
2.	Sessional Test	2	20
3.	Group Discussion	2	05
4.	End Semester Exam	1	70

**MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES**

**Theory:**

Assessments	1	2	3	4	5
Class Test	x	x			x
Quiz	x		x		
Assignment	x		x	x	

**MAPPING OF COURSE LEARNING OUTCOMES**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1		3	3,4			5	4		2

**EVALUATION**

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

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**SYSTEM PROGRAMMING**

**L T P**  
**3 1 0**

MODULE CODE	<b>COAP1214</b>
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

A study of the subject matter presented in this course will enable the students to become familiar with:

1. basics of Compilers
2. 8086 Microprocessor
3. assembler
4. loaders and linkers

**LEARNING OUTCOMES:**

Following this course students will be able to:

1. Discuss IT-oriented security issues and protocols.
2. Demonstrate appropriate social skills and personal responsibility.
3. Communicate effectively with a range of audiences.
4. Analyse the local and global impact of computing on individual's organizations and society.
5. Demonstrate strong programming skills which may include writing debugging or testing computer programs.

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**MODULE CONTENT:**

<u>Unit I: Evolution of the components of systems programming</u> Assemblers; Loaders; Linkers; Macros; Compilers.
<u>Unit II: Software Tools</u> Variety of software tools, Text editors, Interpreters and program generators, Debug Monitor, Programming environment.
<u>Unit III: Loader</u> Loader schemes, compile and go loader, general loader schemes, absolute loader, Subroutine linkage, Reallocating loader, Direct Linkage Loader, Binders, Linking loader, overlays.
<u>Unit IV: Assembly language programming</u> Introduction to 8086. Architecture of 8086 microprocessor, Data representation, Instruction formats, addressing techniques, Flow control, Segments – Data Segment, Code Segment, Stack Segment, Procedures, Input/ Output, Interrupts and Program development in 8086. Basic programming in Assembly.
<u>Unit V: Assembler</u> Macro processor, macros, calls, parameters, expansion, design of two-pass assembler.
<u>Unit VI: Loaders and linkers</u> Loading schemes, design of absolute and direct linking loaders.

**RECOMMENDED BOOKS**

<b>TEXT BOOK</b>	<ol style="list-style-type: none"> <li>1. Microcomputer Systems: The 8086-8088 Family, Architecture, Programming, and Design: Yu-Cheng Gibson, Glenn A and Liu, Prentice Hall Inc., NJ</li> <li>2. The Intel Microprocessors: 8086/8088, 80186, 80286, 80386, 80486, Pentium, Pentium Pro, and Pentium II, Pentium III, Pentium 4: Barry B Brey Prentice Hall, New Delhi</li> </ol>
<b>REFERENCE BOOK</b>	<ol style="list-style-type: none"> <li>1. IBM PC Assembly Language and Programming: Peter Abel Pearson Education</li> <li>2. Linkers and Loaders- The Morgan Kaufmann Series in Software Engineering and Programming: J R Levine</li> <li>3. System Software: S Chattopadhyay Prentice-Hall of India, New Delhi</li> </ol>

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**METHODS OF TEACHING AND STUDENT LEARNING**

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

**ASSESSMENT METHODOLOGIES**

This subject will be evaluated for a total of 100 marks.

**Theory:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	2	05
2.	Sessional Test	2	20
3.	Group Discussion	2	05
4.	End Semester Exam	1	70

**MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES**

Assessments	1	2	3	4	5
Class Test		x	x		
Quiz	x			x	x
Assignment		x		x	

**MAPPING OF COURSE LEARNING OUTCOMES**

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1		3,5			2		4		

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**EVALUATION**

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

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- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
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**SYSTEMS ANALYSIS AND DESIGN**

**L T P**  
**3 1 0**

MODULE CODE	<b>COAP1215</b>
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	30
SUMMATIVE ASSESMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

**OBJECTIVES:**

A study of the subject matter presented in this course will enable the students to become familiar with:

1. System and SDLC
2. Role of system analyst

**LEARNING OUTCOMES:**

After successfully completing this course, students will have gained comprehensive theoretical knowledge as well as practical skills related to the system development process of information systems. Students who successfully complete the course should be able to:

1. Gather data to analyse and specify the requirements of a system.
2. Design system components and environments.
3. Build general and detailed models that assist programmers in implementing a system.
4. Design a database for storing data and a user interface for data input and output, as well as controls to protect the system and its data.

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**MODULE CONTENT:**

<p><u>UNIT-I: Introduction to system</u> Definition and characteristics of a system, elements of a system, types of system; System development life cycle: software requirement, feasibility study and analysis, designing, coding, testing, implementation and maintenance.</p>
<p><u>UNIT-II: Role of system analyst</u> Analyst/user interface, system analysis, sources of project requests, initial investigation, fact finding, information gathering and various tools, fact analysis ; Structured analysis: Various Tools, DFD, Data dictionary, Flow charts, Gantt charts, decision tree, decision table, structured tools, pros and cons of each tool.</p>
<p><u>UNIT-III: Feasibility study</u> Introduction, objective, its types, steps in feasibility analysis; Feasibility report; Oral presentation; Cost and benefit analysis: methods of determining costs and benefits interpret results of analysis and take final action.</p>
<p><u>UNIT-IV: System Design</u> System design objective, low level and high level design, design methodologies, structured design, form-driven methodology(IPO charts), structured walkthrough techniques ;Input/output and form design: input design, objectives of input design, output design, objectives of output design, form design, classification of forms, requirements of form design, types of forms, layout considerations, form control.</p>
<p><u>UNIT-V: System testing</u> Introduction, objectives of testing, test plan, testing techniques/types of system tests, quality assurance goals in system life cycle.</p>
<p><u>UNIT-VI: System implementation</u> Process of implementation, system evaluation, system maintenance and its types; System documentation, Forms of documentation.</p>

**RECOMMENDED BOOKS:**

<b>TEXT BOOKS</b>	<ol style="list-style-type: none"><li>1. System Analysis and Design: Elias Awad Galgotia Publication, New Delhi</li></ol>
<b>REFERENCEBOOKS</b>	<ol style="list-style-type: none"><li>1. Introductory System Analysis and Design: Lee, Vol. I and II London Press, London</li><li>2. Data Management and Data Structures: Loomis Prentice hall india, New Delhi</li></ol>



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**EVALUATION**

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
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**PROFESSIONAL COMMUNICATION – 1**

**L T P**  
**0 0 2**

MODULE CODE	<b>VALU0115</b>
CREDIT POINTS	1
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	50
END SEMESTER EXAM DURATION	2 hrs
LAST REVISION DATE	

**INSTRUCTIONS:** All questions are compulsory. Each question may have multiple options and will cover all units.

**OBJECTIVES:**

The aim of this subject is to develop understanding on different aspects related to oral and written linguistic skills of expressing and exchanging information / interacting & communicative competencies to enhance skills as mentioned below:

1. To prepare students to develop basic understanding on professional & corporate communication.
2. To acquire study skills and communication skills in formal and informal situations.
3. To understand fundamental syntax and semantics of communication.
4. To achieve an understanding & confidence in formal and informal contexts of communication.

**LEARNING OUTCOMES:**

1. Able to understand the Importance of professional & corporate communication.
2. Exposure to various principles, concepts, types, advantages and disadvantages of professional communication.
3. Improve the language proficiency with an emphasis on Speaking, Listening, Reading and Writing skills.
4. Communicate confidently in formal and informal contexts.

**MODULE CONTENTS**

<p><u><i>UNIT I:- INTRODUCTION TO COMMUNICATION –</i></u></p> <ul style="list-style-type: none"><li>• Definition</li><li>• Types of Communication</li><li>• Language as a tool of communication</li><li>• Levels of communication – Interpersonal, Organizational, Mass communications</li><li>• The flow &amp; Channels of Communication - Downward, Upward, Lateral or Horizontal (Peer group)</li><li>• Barriers to Communication</li></ul>
<p><u><i>UNIT II: PRESENTATION STRATEGIES &amp; LISTENING SKILLS –</i></u></p> <ul style="list-style-type: none"><li>• Defining Purpose</li><li>• Organizing Contents;</li></ul>

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<ul style="list-style-type: none"> <li>• Preparing Outline</li> <li>• Audio-visual Aids</li> <li>• Nuances of Delivery</li> <li>• Body Language</li> <li>• Dimensions of Speech - Syllable, Accent, Pitch, Rhythm, Intonation</li> <li>• Paralinguistic features of voice</li> <li>• Listening Skills - Active Listening, Passive Listening</li> <li>• Methods for improving Listening Skills</li> </ul>														
<p><u><i>UNIT III: BUSINESS COMMUNICATION-</i></u></p> <ul style="list-style-type: none"> <li>• Letter Writing – formal &amp; Informal</li> <li>• Letters of inquiry &amp; complaint</li> <li>• Job application and Resumes</li> <li>• Reports- Types, Significance, Structure, Style &amp; Writing of Reports</li> <li>• Technical Proposal – Parts, Types, Writing of Proposal</li> <li>• Negotiation &amp; Business Presentation skills</li> </ul>														
<p><u><i>UNIT IV: VALUE BASED TEXT READING-</i></u></p> <p>Value based critical reading of following Short Stories for making the Students acquaint with the styles of great Writers of World-</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">• O.H. Henry :</td> <td style="padding-left: 100px;">The Gift of the Magi</td> </tr> <tr> <td style="padding-left: 20px;">• R.N. Tagore :</td> <td style="padding-left: 100px;">The Renunciation</td> </tr> <tr> <td style="padding-left: 20px;">• Katherine Mansfield :</td> <td style="padding-left: 100px;">The Fly</td> </tr> <tr> <td style="padding-left: 20px;">• A.P. Chekhov :</td> <td style="padding-left: 100px;">The Lament</td> </tr> <tr> <td style="padding-left: 20px;">• M.R. Anand :</td> <td style="padding-left: 100px;">The Barber’s Trade Union</td> </tr> <tr> <td style="padding-left: 20px;">• Ruskin Bond :</td> <td style="padding-left: 100px;">The Eyes Are Not Here</td> </tr> <tr> <td style="padding-left: 20px;">• D.H. Lawrence :</td> <td style="padding-left: 100px;">The Rocking Horse Winner</td> </tr> </table>	• O.H. Henry :	The Gift of the Magi	• R.N. Tagore :	The Renunciation	• Katherine Mansfield :	The Fly	• A.P. Chekhov :	The Lament	• M.R. Anand :	The Barber’s Trade Union	• Ruskin Bond :	The Eyes Are Not Here	• D.H. Lawrence :	The Rocking Horse Winner
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**RECOMMENDED BOOKS:**

<b>TEXT BOOKS</b>	<ol style="list-style-type: none"> <li>1. Communication Skills for Engineers and Scientists, Sangeeta Sharma et.al. PHI Learning Pvt.Ltd,2011, New Delhi.</li> <li>2. Improve Your Writing ed. V.N.Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi.</li> </ol>
<b>REFERENCE BOOKS</b>	<ol style="list-style-type: none"> <li>1. Manual of Practical Communication by L.U.B.Pandey: A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2013, Delhi.</li> </ol>

**MAPPING OF COURSE LEARNING OUTCOMES**

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes										1,2	3,4

**METHODS OF TEACHING AND STUDENT LEARNING**

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The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

**ASSESSMENT METHODOLOGIES:**

This subject will be evaluated for a total of 100 marks for theory.

**Theory:**

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	1	10
2.	Sessional Test	2	15
3.	End Semester Written Exam	1	50
4.	End Semester Oral Exam	1	25

**MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES**

**Theory:**

Assessments	1	2	3	4
Class Test	x	x	x	
Quiz	x	x	x	
Assignment			x	x

**EVALUATION**

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