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
TOTAL CREDITS				**22**	**1**	**08**	**26.5**

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

Category	
G	General
BCA	Bachelor of Computer Applications
M	Management

Sub Category	
PC	Program Core

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

SEMESTER – I

COMPUTER FUNDAMENTAL AND PROGRAMMING

L	T	P
3	1	0

MODULE CODE	**COAP1101**
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:

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

RECOMMENDED BOOKS:

TEXT BOOKS	1. Computing Fundamentals and Programming in C by Gill Nasib Singh, Khanna Books Publishing Co., New Delhi. 2. Computing Fundamentals and C Programming by Balagurusamy E, Tata McGraw Hill. 3. Fundamental of Computers by P. K. Sinha, B.P.B. Publications.
REFERENCEBOOKS	1. Application of IT to Business by Chhillar, Rajender Singh, Ramesh Publishers, Jaipur. 2. Fundamental of Computers by V. Rajaraman, B.P.B. Publications.

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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

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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

PROGRAMMING WITH C

L	T	P
4	0	0

MODULE CODE	**COAP1102**
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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BACHELOR OF COMPUTER APPLICATIONS

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

RECOMMENDED BOOKS:

TEXT BOOKS	1. Peter Norton, 2006, "Introduction to Computers", Sixth Edition, Tata McGraw Hill Publication, 2. E. Balaguruswamy, 2002, "Programming in ANSI C", Third edition, Tata McGraw Hill Publications, 3. Yaswant Kanetkar, "Let us C ", BPB Publications: 14th edition.
REFERENCEBOOKS	1. Programming with C by Bryon's Gottfried, Tata Mcgraw Hill. 2. The C Programming 2nd Edition, By Brian W Kernigham and Dennis M Ritchie", PHI.

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

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MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

PROGRAMMING WITH C LAB

L	T	P
0	0	4

MODULE CODE	**COAP1103**
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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BACHELOR OF COMPUTER APPLICATIONS

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.
Experiments based on advanced topics:	
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.

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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

PC SOFTWARE

L	T	P
4	0	0

MODULE CODE	**COAP1104**
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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BACHELOR OF COMPUTER APPLICATIONS

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..

RECOMMENDED BOOKS:

TEXT BOOKS	1. Microsoft Office Complete Reference: Jennifer Kettell, Guy Hart-Davis and Curt Simmons McGraw Hill, New York 2. Learn Microsoft Office: Russell A Stultz B P B Publications, New Delhi
REFERENCEBOOKS	1. Microsoft Office 2000 Courter: Gini Courter and Annette Marquis Sybex Inc; Hoboken United States 2. Microsoft Office XP Fast and Easy: Diane Koers Prentice Hall of India, Patparganj Industrial State, Delhi 3. Office XP: The Complete Reference: Julia Kelly and Stephen L Nelson Tata McGraw Hill, India

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		

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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

PC SOFTWARE LAB

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

MODULE CODE	**COAP1105**
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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BACHELOR OF COMPUTER APPLICATIONS

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 CapSpelling and Grammer 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 • Manuplating and enhancing slides • Word art • Animations and sounds • Sound effect
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
Experiments based on advanced topics:	
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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BACHELOR OF COMPUTER APPLICATIONS

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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

MATHMATICS

L	T	P
4	0	0

MODULE CODE	**MATH0112**
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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BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENT:

Unit I: Matrices 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.
Unit II: Sets 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.
Unit III: Relations and functions Properties of Relations; Equivalence Relation; Partial Order Relation Function: Domain and Range; Onto; Into and One to One Functions; Composite and Inverse Functions.
Unit IV: Limits and continuity 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
Unit V: Differentiation 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.
Unit VI: Integration 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;.

RECOMMENDED BOOKS

TEXT BOOK	1. Advanced Engineering Mathematic by Reyszig Erwin, John Wiley and Sons Ohio State University Columbus, Ohio. 2. Elementary Engineering Mathematics by Dr B S Grewal, Khanna Publications, New Delhi.
REFERENCE BOOK	1. Advanced Engineering Mathematics by H K Dass, S Chand and Sons, New Delhi. 2. Integral Calculus by Shanti and Narayan, S Chand and Company, New Delhi. 3. Differential Caluculs by Shanti and Narayan, S Chand and Company, New Delhi.

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						

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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

INTRODUCTION TO DIGITAL ELECTRONICS

L	T	P
4	0	0

MODULE CODE	**ECEN0103**
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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENT:

UNIT-I: Information Representation Number Systems(decimal ,binary,octal and hexadecimal number system)
UNIT-II: Binary Logic Binary Arithmetic (addition , subtraction multiplication and division) Fixed-point and Floating point representation of numbers, BCD Codes,
UNIT-II: Error –Detection Code Error detecting and correcting codes, Character Representation – ASCII, EBCDIC, Unicode Boolean Algebra, Boolean Theorems, Boolean Functions and Truth Tables,
UNIT-III: Boolean Algebra & Digital Logic 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,
UNIT-V: Combinational Circuits-1 Encoders, Decoders, Multiplexers, Demultiplexers, Comparators, Code Converters, BCD to Seven-Segment Decoder.
UNIT-VI: Combinational Circuits-1I Encoders , Decoders, Multiplexers, Demultiplexers, Comparators, Code Converters, BCD to Seven-Segment Decoder

RECOMMENDED BOOKS:

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

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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

Theory:

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

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	**MGMT0101**
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 identity 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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BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENT

Unit 1: Management–introduction 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.
Unit II:: Basic concepts of Leadership Leadership: Functions of leaders, styles of leadership , leadership theories- Trait theory, Behavioral Theory
Unit III: Planning, Organizing and Decision making Planning- process of planning, elements of planning; steps in Organizing , authority and responsibility , delegation, centralization vs. decentralization; decision making, rationality in decision making.
Unit IV:: Team Development Work team , nature of work teams, types of team, stages of team development, role of leadership in team development.
UNIT-V: Communication Communication: Communication process, importance of communication, communication channels, Roles and barriers to communication.
Unit VI: Motivation Motivation: Process and motivation models/approaches; relevance of motivation theories in Business.

RECOMMENDED BOOKS

TEXT BOOK	1. Fundamentals of Management by Robbins, S.P. and Decenzo, D.A Pearson Education Asia, New Delhi 2. Organizational Behaviour by F Luthan's, Tata McGraw Hill, New Delhi
REFERENCE	1. Organizational behaviour by S P Robbins, Prentice Hall of India, New Delhi 2. Essentials of management by Chhabra T.N. , Sun India publications

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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BACHELOR OF COMPUTER APPLICATIONS

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
TOTAL CREDITS				**19**	**1**	**14**	**26.5**

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

ELECTIVES

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

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BACHELOR OF COMPUTER APPLICATIONS

SEMESTER – II

INTRODUCTION TO WEB TECHNOLOGIES

L	T	P
4	0	0

MODULE CODE	**COAP1106**
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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BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENT:

Unit 1: Introduction to Internet About internet and World Wide Web; Evolution and History of World Wide Web, Basic features.
Unit II: Basic features Web Browsers; Web Servers*; Email, Web Portal, Domain Names*, Hypertext Transfer Protocol; Overview of TCP/IP and its services; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools.
Unit III: Web publishing 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.
Unit IV: Web development Introduction to HTML; Hypertext and HTML; HTML Document features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring, *HTML Comments, Anchor Tag, Adding images and sound*
Unit V: Text colours and background 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.
Unit VI: DHTML, Style sheets and Scripting 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

RECOMMENDED BOOKS

TEXT BOOK	1.Internet and Web Technologies: Raj Kamal Tata McGraw Hill, New Delhi 2.Multimedia and Web Technology: Ramesh Bangia Firewall Media, New Delhi
REFERENCE BOOK	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

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

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,
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BACHELOR OF COMPUTER APPLICATIONS

WEB TECHNOLOGIES LAB

L	T	P
0	0	4

MODULE CODE	**COAP1107**
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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BACHELOR OF COMPUTER APPLICATIONS

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>, ,<s>,<code>,<big>,<small>,)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.
Experiments based on advanced topics:	
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).

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,
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- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

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BACHELOR OF COMPUTER APPLICATIONS

OBJECT ORIENTED LANGUAGE USING C++

L	T	P
4	0	0

MODULE CODE	**COAP1108**
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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BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENT:

Unit I: Introduction Object oriented programming approach; characteristics of object orientated languages; Bridging C and C++ (Overview of C Concepts). 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++. Class Declaration: Data Members; Member Functions; Private and Public Members; Data Hiding and Encapsulation; Array within a class.
Unit II: Class function definition 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.
Unit III: Constructors and Destructors Declaration and Definition; Default Constructors; Parameterized Constructors; Constructor Overloading; Copy Constructors. Destructors: Definition and use.
Unit IV: Inheritance 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.
Unit V: Function overloading and operator overloading Binary and Unary. Polymorphism: Definition; early Binding; Polymorphism with pointers; Virtual Functions; late binding; pure virtual functions.
Unit VI:: Input/output files Exception Handling; Template; *Streams and files, Namespaces, the basic Streamclasses : C++ predefined streams.*

RECOMMENDED BOOKS:

TEXT BOOKS	1. Object Oriented Programming with C++ ; E Balagurusami; Tata McGraw Hill; New Delhi **2.** Object Oriented Programming in Turbo C++; Robert Lafore ; Galgotia Publications; Delhi
REFERENCEBOOKS	1. The C++ Programming Language ; Bjarna Stroustrup ; Addison-Wesley Publishing Company; UK 2. Object Oriented Programming Using C++; Salaria R S ;Khanna Book; New Delhi.

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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

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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BACHELOR OF COMPUTER APPLICATIONS

C++ LAB

L	T	P
0	0	4

MODULE CODE	**COAP1109**
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 characterstics 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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BACHELOR OF COMPUTER APPLICATIONS

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. • Use default constructor to get numbers from user and display average. • Use parameterized constructor to display date. • Use copy constructor and print value of object four times. • Use dynamic constructor to calculate interest of amount.
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 • Use of get() and put() • Use of getline() and write().
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

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,
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BACHELOR OF COMPUTER APPLICATIONS

DATA BASE MANAGEMENT SYSTEM

L	T	P
4	0	0

MODULE CODE	**COAP1110**
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.

REFERENCE	1. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", FourthEdition , Addision Wesley, 2002. 2. Raghu Ramakrishnan, "Database Management Systems", Third Edition, McGraw Hill, 2002. 3. Jeffrey D.Ullman, " Principles of Database systems", Galgodia Publishers, 1988. 4. C.J.Date, "Introduction to database systems", Eight Edition, Addison Wesley, 2003.

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	10
2.	Sessional Test	2	10
3.	Group Discussion	2	10
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	x	x
Quiz	x	x			
Assignment	x	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											

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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

DATA BASE MANAGEMENT SYSTEM LAB

L	T	P
0	0	4

MODULE CODE	**COAP1111**
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 coveringconceptual design, logical design and an overview of physical design
4. To present the concepts and techniques relating to query processing by SQLengines

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/DDL commands.
5. Programming PL/SQL including stored procedures, stored functions, cursors,packages.

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LIST OF EXPERIMENTS

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

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).

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
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

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COMPUTER ARCHITECTURE **L T P**

4 0 0

MODULE CODE	**COAP1112**
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:

Unit I: Basic computer organization and design 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.
Unit II: Register transfer and micro-operation Register transfer language, register transfer, bus and memory transfer, arithmetic micro-operations, logic micro-operations, shift micro-operations.
Unit III: Micro-programmed control unit and central processing unit Micro-programmed Control Unit: Control memory, address sequencing; Central Processing Unit: Introduction, general register organization, stack organization, instruction formats, addressing modes.
Unit IV: Pipeline and vector processing Parallel Processing, pipelining, arithmetic pipeline, RISC Pipeline, Vector Processing, Array Processors.
Unit IV: Input-Output organization and memory organization 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.
Unit VI: Multiprocessors Characteristics of multiprocessor, Interconnection Structure, Interprocessor Communication and Synchronization.

RECOMMENDED BOOKS:

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

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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BACHELOR OF COMPUTER APPLICATIONS

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	**COAP1213**
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:

Unit I: Algorithm 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.
Unit II: Graph theory 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.
Unit III: Recursion Recursively defined function. Merge sort; Insertion sort; Bubble sort; and Decimal to Binary.
Unit IV: Recurrence relations LHRR; LHRRWCCs; DCRR. Recursive procedures
Unit V: Number theory Principle of Mathematical induction; GCD; Euclidean algorithm; Fibonacci numbers; congruences and equivalence relations; public key encryption schemes.
Unit VI: Basic statistics Measure of Central Tendency; Preparing frequency distribution table;Mean; Mode; Median; Measure of Dispersion: Range; Variance and Standard Deviations; Correlation and Regression.

RECOMMENDED BOOKS:

TEXT BOOKS	1.Fundamentals of Applied statistics; Gupta S P ,Kapoor and V K ; Sultan Chand and Sons; New Delhi 2.Introduction to Statistics; Graybil1 Tata McGraw Hill; New Delhi
REFERENCEBOOKS	1.Statistical Modelling; Anderson Tata McGraw Hill, New Delhi 2.Discrete Mathematics; Babu Ram Pearson Education India, New Delhi.

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	

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;
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PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

SYSTEM PROGRAMMING

L	T	P
3	1	0

MODULE CODE	**COAP1214**
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:

Unit I: Evolution of the components of systems programming Assemblers; Loaders; Linkers; Macros; Compilers.
Unit II: Software Tools Variety of software tools, Text editors, Interpreters and program generators, Debug Monitor, Programming environment.
Unit III: Loader Loader schemes, compile and go loader, general loader schemes, absolute loader, Subroutine linkage, Reallocating loader, Direct Linkage Loader, Binders, Linking loader, overlays.
Unit IV: Assembly language programming 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.
Unit V: Assembler Macro processor, macros, calls, parameters, expansion, design of two-pass assembler.
Unit VI: Loaders and linkers Loading schemes, design of absolute and direct linking loaders.

RECOMMENDED BOOKS

TEXT BOOK	**1.** Microcomputer Systems: The 8086-8088 Family, Architecture, Programming, and Design**:** Yu-Cheng Gibson, Glenn A and Liu, Prentice Hall Inc., NJ **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
REFERENCE BOOK	1. IBM PC Assembly Language and Programming: Peter Abel Pearson Education 2. Linkers and Loaders- The Morgan Kaufmann Series in Software Engineering and Programming: J R Levine 3. System Software**:** S Chattopadhyay Prentice-Hall of India, New Delhi

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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		

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,
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SYSTEMS ANALYSIS AND DESIGN

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

MODULE CODE	**COAP1215**
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:

UNIT-I: Introduction to system 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.
UNIT-II: Role of system analyst 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.
UNIT-III: Feasibility study 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.
UNIT-IV: System Design 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.
UNIT-V: System testing Introduction, objectives of testing, test plan, testing techniques/types of system tests, quality assurance goals in system life cycle.
UNIT-VI: System implementation Process of implementation, system evaluation, system maintenance and its types; System documentation, Forms of documentation.

RECOMMENDED BOOKS:

TEXT BOOKS	1. System Analysis and Design: Elias Awad Galgotia Publication, New Delhi
REFERENCEBOOKS	1. Introductory System Analysis and Design: Lee, Vol. I and II London Press, London 2. Data Management and Data Structures: Loomis Prentice hall india, New Delhi

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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

Theory:

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

MAPPING OF COURSE LEARNING OUTCOMES

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

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- Approved refinement decisions due for implementation;
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PROFESSIONAL COMMUNICATION – 1 **L T P**
0 0 2

MODULE CODE	**VALU0115**
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

UNIT I:- INTRODUCTION TO COMMUNICATION –

- Definition
- Types of Communication
- Language as a tool of communication
- Levels of communication – Interpersonal, Organizational, Mass communications
- The flow & Channels of Communication - Downward, Upward, Lateral or Horizontal (Peer group)
- Barriers to Communication

UNIT II: PRESENTATION STRATEGIES & LISTENING SKILLS –

- Defining Purpose
- Organizing Contents;

- Preparing Outline
- Audio-visual Aids
- Nuances of Delivery
- Body Language
- Dimensions of Speech - Syllable, Accent, Pitch, Rhythm, Intonation
- Paralinguistic features of voice
- Listening Skills - Active Listening, Passive Listening
- Methods for improving Listening Skills

UNIT III: BUSINESS COMMUNICATION–

- Letter Writing – formal & Informal
- Letters of inquiry & complaint
- Job application and Resumes
- Reports- Types, Significance, Structure, Style & Writing of Reports
- Technical Proposal – Parts, Types, Writing of Proposal
- Negotiation & Business Presentation skills

UNIT IV: VALUE BASED TEXT READING-

Value based critical reading of following Short Stories for making the Students acquaint with the styles of great Writers of World-

- O.H. Henry : The Gift of the Magi
- R.N. Tagore : The Renunciation
- Katherine Mansfield : The Fly
- A.P. Chekhor : The Lament
- M.R. Anand : The Barber's Trade Union
- Ruskin Bond : The Eyes Are Not Here
- D.H. Lawrence : The Rocking Horse Winner

RECOMMENDED BOOKS:

TEXT BOOKS	1. Communication Skills for Engineers and Scientists, Sangeeta Sharma et.al. PHI Learning Pvt.Ltd,2011, New Delhi. 2. Improve Your Writing ed. V.N.Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi.
REFERENCE BOOKS	1. Manual of Practical Communication by L.U.B.Pandey: A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2013, Delhi.

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

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

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;
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- Approved refinement decisions due for implementation;
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BACHELOR OF COMPUTER APPLICATIONS
SEMESTER - III

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	MARKS		
								INTERNAL	EXTERNAL	TOTAL
COAP2101	BCA	PC	DATA STRUCTURE USING C++	4	0	0	4	30	70	100
COAP2102	BCA	PC	DATA STRUCTURE USING C++ LAB	0	0	4	2	30	70	100
COAP2103	BCA	PC	OPERATING SYSTEM	3	1	0	3.5	30	70	100
COAP2104	BCA	PC	JAVA	4	0	0	4	30	70	100
COAP2105	BCA	PC	JAVA LAB	0	0	4	2	30	70	100
	BCA	PE	ELECTIVE-II*	3	1	0	3.5	30	70	100
COAP2109	BCA	PD	INDUSTRIAL TRAINING I (TRAINING TO BE UNDERGONE AFTER II SEMESTER)	0	0	1	1	25		25
COAP2110	BCA	PD	SPECIALIZED MINOR PROJECT (GROUP)	0	0	4	2	50		50
	G		FOREIGN LANGUAGE PART-I#	2	0	0	2	25	50	75
VALU0119	P	AE	APTITUDE I	2	0	0	2	25	50	75
	P	AE	YOGA/NCC/NSS*	0	0	2	1	25		25
TOTAL CREDITS				**18**	**2**	**15**	**27**	**TOTAL MARKS**		**850**

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

ELECTIVES

MODULE CODE	ELECTIVE-II**
COAP2206	OBJECT ORIENTED ANALYSIS AND DESIGN
COAP2207	MULTIMEDIA TECHNOLOGIES
COAP2208	MOBILE COMPUTING

 # FOREIGN LANGUAGE
One foreign language out of the following

MODULE CODE	MODULE NAME
LANF0107	FRENCH
LANG0108	GERMAN
LANS0109	SPANISH

MODULE CODE	MODULE*
VALU0118	YOGA
VALU0121	NCC
VALU0122	NSS

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DATA STRUCTURE USING C++

L	T	P
4	0	0

MODULE CODE	**COAP2101**
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 teach students how to design, write, and analyse the performance of various data structures. It will also enable students to learn advanced data structure such as Tree, Graph, hash tables.

1. To teach the behavior of basic data structure (list, stack, queue, hash table, trees, graph)
2. To understand and analyze elementary algorithms: sorting, searching
3. To make students familiar with basic techniques of algorithm analysis including time and space complexity
4. To teach the implementation of linked data structures such as linked lists and binary trees
5. To make students familiar with advanced data structures such as balanced search trees, hash tables, priority queues and the disjoint set union/find data structure
6. To make students familiar with some graph algorithms such as shortest path and minimum spanning tree

LEARNING OUTCOMES:

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

1. To characterize the space and time complexity of algorithms
2. To understand different data structures including stack, queue, linked list, tree, heap, graph, and hash table
3. To implement insert, retrieve, and delete operations and traversals of binary search trees
4. Ability to understand traversals and algorithms on graphs
5. To implement hash tables along with insert and retrieve operations

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MODULE CONTENT:

UNIT-I: Introduction Basic Terminology, Elementary Data Organization, Data Structure Operations, Algorithm Complexity and time space trade off.
UNIT-II: Stacks and queues Introduction and primitive operations on stack; Stack application: Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion from infix to postfix; Introduction and primitive operation on queues, D-queues and priority queues.
UNIT-III: Lists Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion, searching, two way lists and use of headers
UNIT-IV: Trees Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion.
UNIT-V: Multilevel indexing and B-Trees Introduction: The invention of the B-tree; Statement of the problem; Indexing with binary search trees; Multilevel indexing, a better approach to tree indexes; B-trees: working up from the bottom; Example for creating a B-tree.
UNIT-VI: Sorting Sorting: Internal & external sorting, Radix sort, Quick sort, Heap sort, Merge sort, Tournament sort, Searching: Liner search, binary search, merging, Comparison of various sorting and searching algorithms on the basis of their complexity. File organization: Serial, Sequential, Indexed-sequential, Random-access/Direct, Inverted, Multilist file organization. Hashing: Introduction, Hashing functions and Collision resolution methods

RECOMMENDED BOOKS

TEXT BOOK	**1.** Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub. Data Structures using C by A. K. Sharma, Pearson
REFERENCE BOOK	2. Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition. 3. Data Structures and Program Design in C By Robert Kruse, PHI, 4. Theory & Problems of Data Structures by Jr. SymourLipschetz, Schaum's outline by TMH 5. Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H. 6. Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H

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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			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		3		4,5		3

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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DATA STRUCTURES USING C++ LAB

L	T	P
0	0	4

MODULE CODE	**COAP2102**
CREDIT POINTS	2
FORMATIVE ASSESSMENT MARKS	30
SUMMATIVE ASSESSMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES:

The basic thrust of the course would be to learn programming language 'C' and implementing data structures.

1. To understand how various data structures work.
2. To understand some important applictions of various data structures.
3. To familiarize how certain applications can benefit from the choice of data structures.
4. To understand how the choice of data structures can lead to efficient implementations of algorithms.

LEARNING OUTCOMES:

At the end of this lab session, the student will

1. Be able to design and analyze the time and space efficiency of the data structure.
2. Be capable to identity the appropriate data structure for given problem.
3. Have practical knowledge on the application of data structures.
4. Implement various sorting and searching techniques.

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LIST OF EXPERIMENTS

1.	Program to insert an element in an array.
2.	Program to delete an element from array.
3.	Program to implement linear search.
4.	Program to implement bubble sort.
5.	Program to implement binary search.
6.	Program to implement matrix multiplication.
7.	Program to implement string operations.
8.	Program to implement linked list.
9.	Program to implement insertion in Linked list.
10.	Program to implement Deletion in Linked list.
11.	Program to implement searching in linked list.
12.	Program to implement sorting in linked list.
13.	Program to implement deletion in linked list.
14.	Program to implement stack using array with both of its operations.
15.	Program to implement queue.
16.	Program to implement insertion sort.
17.	Program to implement heap sort.
18.	Program to implement quick sort.

Note: At least 15 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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OPERATING SYSTEM

L	T	P
3	1	0

MODULE CODE	**COAP2103**
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 operating System
2. Multiprogramming
3. CPU Scheduling
4. Memory Management
5. Virtual Memory
6. Deadlocks
7. File System

LEARNING OUTCOMES:

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

1. Know the functions, structures and history and design issues of operating systems
2. Understand various process management concepts including scheduling, synchronization, deadlocks, memory management and multithreading.
3. Know issues related to file system interface and implementation, disk management
4. Be familiar with protection and security mechanisms
5. Be familiar with various types of operating systems including Unix.

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MODULE CONTENT:

UNIT-I: Introduction Operating System; simple batch systems; multiprogrammed; batches systems; time-sharing systems; Personal-computer systems; Parallel systems; Distributed Systems; Real-Time Systems. Memory Management: Background, logical versus physical address space, swapping, contiguous allocation, paging, segmentation.
UNIT-II: Virtual Memory Demand Paging; Page Replacement; Page-replacement Algorithms; Performance of Demand Paging; Allocation of Frames; Thrashing, Other Considerations.
UNIT-III: Processes Process Concept, process Scheduling, operation on processes; CPU Scheduling: Basic Concepts, scheduling criteria, scheduling algorithms, multiple-processor scheduling; Process Synchronization: Background, the critical-section problem, synchronization hardware, semaphores, classical problems of synchronization.
UNIT-IV: Deadlocks System Model, deadlock characterization, methods for handling deadlocks, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock.
UNIT-V: Device Management Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Input or Output Devices, Storage Devices, Buffering, Secondary-Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Reliability.
UNIT-VI: Information Management Introduction, A Simple File System, General Model of a File System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File System.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Operating System Concepts: Silbersachatz , Galvin Pearson Education, New Delhi
REFERENCEBOOKS	1. Operating Systems: Madnick E, Donovan J, Tata McGraw Hili 2. Operating Systems: Tannenbaum, Prentice Hall India, New Delhi.

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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**	

MAPPING OF COURSE LEARNING OUTCOMES

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

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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JAVA **L T P**
4 0 0

MODULE CODE	**COAP2104**
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. Object oriented programming
2. JAVA
3. How to create packages in JAVA
4. Exception handling in JAVA
5. Multithread in java
6. Applet introduction and manipulating text

LEARNING OUTCOMES:

Following this course, students will be able to:

1. Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
2. Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3. Be aware of the important topics and principles of software development.
4. Have the ability to write a computer program to solve specified problems.
5. Be able to use the Java SDK environment to create, debug and run simple Java programs.

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MODULE CONTENT:

UNIT-I: : Object-oriented language **:** Paradigms of Programming Languages, Evolution of OO Methodology, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs, Introduction to Common OO Language, Applications of OOPs . Object Oriented Methodology-2: Classes and Objects, Abstraction and Encapsulation, Inheritance, Polymorphism
UNIT-II: Arrays and strings Introduction To Java, Basic Features, Java Virtual Machine Concepts, Primitive Data Type And Variables, Java Operators, Expressions, Statements and Arrays. Object Oriented Concepts: Class and Objects-- Class Fundamentals, Creating objects , Assigning object reference variables; Introducing Methods, Static methods, Constructors , Overloading constructors; This Keyword; Using Objects as Parameters, Argument passing, Returning objects , Method overloading, Garbage Collection, The Finalize ( ) Method. Inheritance and Polymorphism: Inheritance Basics, Access Control, Multilevel Inheritance, Method Overriding, Abstract Classes, Polymorphism, Final Keyword.
UNIT-III: Packages and interfaces Understanding Packages, Defining a Package, Packaging up Your Classes, Adding Classes from a Package to Your Program, Understanding CLASSPATH, Standard Packages, Access Protection in Packages, Concept of Interface.
UNIT-IV: Exception handling The concept of Exceptions, Types of Exceptions, Dealing with Exceptions, Exception Objects, Defining Your Own Exceptions
UNIT-V: : Multithreading programming The Java Thread Model, Understanding Threads, The Main Thread, Creating a Thread, Creating Multiple Threads, Thread Priorities, Synchronization, Deadlocks Inter-thread communication, Deadlocks; Input/output in Java: I/O Basic, Byte and Character Structures, I/O Classes, Reading Console Input Writing Console Output, Reading and Writing on Files, Random Access Files, Storing and Retrieving Objects from File, Stream Benefits. .
UNIT-VI: Creating applets Applet Basics, Applet Architecture, Applet Life Cycle, Simple Applet Display Methods, Requesting Repainting, Using The Status Window, The HTML APPLET Tag, Passing Parameters to Applets.

RECOMMENDED BOOKS

TEXT BOOKS	1.The Complete Reference JAVA Tata McGraw Hill Publication New Delhi 2. Programming in Java, E Balagurusamy .
REFERENCE BOOKS	1. JAVA 2 UNLEASHED Tech Media Publications 2. JAVA 2(1.3) API Documentations

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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						

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,
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- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

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JAVA LAB

L	T	P
0	0	4

MODULE CODE	**COAP2105**
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 students to become familiar with:

1. To understand the Programming skills and develop the Program.
2. To understand the Structure, flow and Working of a java Program.
3. To develop analyzing and problem solving skills and use the same for writing programs in java.
4. To familiarize the trainee with basic concepts of computer programming and developer tools.
5. To present the syntax and semantics of the "java" 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 java Program.
2. Deal with the basic scalar data types and their operators.
3. Know and Implement the object and classes.
4. Understand and Implement the arrays, strings, sorting etc.
5. Learn inheritance , packages and interfaces.
6. Learn the multithread and applet implementation.

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LIST OF EXPERIMENTS

1.	Write a java Program to check if a given number is odd or even.
2.	Write a java Program to compute result of the student using switch case.
3.	Write a java program to make a class Room and compute its area.
4.	Write java program to demonstrate single inheritance.
5.	Write a java program to perform function overriding.
6.	Write a java program to sort an array using bubble sort.
7.	To write a java Program to demonstrate string operations.
8.	To write a java program to implement interface.
9.	To write a java program for multithread implementation
10.	To write a java program for exception handling demonstration..
11.	To write a program for throwing your own exception.
12.	To write a program for simple “hello world” applet.
Experiments based on advanced topics:	
13	Create a applet for creating a simple calculator.

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).

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

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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		1,2,4	1,3,4	3,4		1,3		4	6		5

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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OBJECT ORIENTED ANALYSIS AND DESIGN

L	T	P
3	1	0

MODULE CODE	**COAP2206**
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. Object Oriented Programming
2. Object and Dynamic Modeling
3. UML and Class design
4. Use case and activity diagram.
5. Events and signals, state machines, processes and threads.
6. Time and Space.

LEARNING OUTCOMES:

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

1. Object oriented conceps and Modelling.
2. What is OOAD.
3. UML and its usage.
4. Class and object diagrams.
5. System software design issues.
6. Ability to apply the knowledge of Math, Science & engineering.

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MODULE CONTENT:

Unit-I: Introduction Object Oriented Programming and Object Oriented Design; Concepts of classes, objects, abstraction, encapsulation, inheritance, function overloading, virtual functions, function overriding, templates.
Unit-II: Object modelling Class and object diagrams, association, aggregation, generalization
Unit-III: Dynamic modelling Dynamic modelling and functional modelling.
Unit-IV: Introduction to UML Class diagrams, Use cases, interaction diagrams, collaboration diagrams, deployment diagrams.
Unit-V: Principles of class design Open close principle, Liskov's substitution principle, dependency inversion principle, package cohesion principle etc.
Unit-VI: System software design issue Design of assemblers, macro processors, linkers and loaders, dynamic linking.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Object Oriented Programming with C++: Robert Lafore 2. Object Oriented Modeling and Design: James Rumbagh
REFERENCEBOOKS	1. System Programming: Dhamdhere Vikas Publishing House, New Delhi 2. System Programming: Donovan John Wiley and Sons, New Delhi 3. Object Oriented Analysis and Design: Grady Booch

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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	6
Class Test	**x**			**x**		**x**
Quiz		**x**	**x**		**x**	**x**
Assignment					**x**	

MAPPING OF COURSE LEARNING OUTCOMES

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

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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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MULTIMEDIA TECHNOLOGIES **L T P**

3 1 0

MODULE CODE	**COAP2207**
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. Multimedia building blocks
2. Multimedia standards and compression and decompression technologies.
3. Tools like FLASH and Dream Weaver.

LEARNING OUTCOMES:

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

1. Understand the analog and digital conversion process.
2. Compare and contrast between bitmap & vector graphic.
3. Digitization and compression.
4. Audio & video file formats, technologies and standards.
5. Multimedia authoring tools.

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MODULE CONTENT:

Unit I: Introductory concepts Multimedia – Definitions, CD-ROM and the Multimedia Highway, Uses of Multimedia.
Unit II: Introduction to making multimedia The Stages of project, the requirements to make good multimedia, Multimedia skills and training, Training opportunities in Multimedia.
Unit III: Multimedia-hardware and software Multimedia Hardware – Macintosh and Windows production Platforms, Hardware peripherals – Connections, Memory and storage devices, Media software – Basic tools, making instant multimedia, Multimedia software and Authoring tools.
Unit IV: Multimedia building blocks making it work – multimedia building blocks – Text, Sound, Images, Animation and Video, Digitization of Audio and Video objects.
Unit V: Data compression Different algorithms concern to text, audio, video and images etc., Working Exposure on Tools like FLASH and Dream Weaver.
Unit VI: Multimedia and the internet History, Internet working, Connections, Internet Services, The World Wide Web, Tools for the WWW – Web Servers, Web Browsers, Web page makers and editors, Plug-Ins and Delivery Vehicles, VRML, Designing for Multimedia Applications – Media Communication.

RECOMMENDED BOOKS:

TEXT BOOKS	**1.** .Multimedia and Communication Systems :Steve Heath Focal Press, UK
REFERENCEBOOKS	1 Multimedia: Making it work :Tay Vaughan Tata Mcgraw Hill, New Delhi. 2 Multimedia System Design :K Andleigh and K Thakkar Prentice Hall of India, New Delhi

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS
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	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		2,3	4			4,5			2

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BACHELOR OF COMPUTER APPLICATIONS

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;
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- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

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MOBILE COMPUTING **L T P**

3 1 0

MODULE CODE	**COAP2208**
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. The basics of networking theory.
2. Networking concepts relevant to modern wireless systems.
3. Emerging mobile computing ideas and best practices.
4. Wireless markup language and WAP.

LEARNING OUTCOMES:

Following this course, students will be able to:

1. Understand fundamentals of networking.
2. Understand fundamentals of mobile computing.
3. Handshaking and MSC
4. Basic understanding of WAP.

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MODULE CONTENT:

Unit 1: Introducing the mobile internet Issues in Mobile Computing, Wireless Telephony, Digital Cellular Standards, Bluetooth Technology, Wireless Multiple Access Protocols, Channel Allocations in Cellular Systems. The Mobile Internet is here, The Rise of Mobile data; Key Services for the mobile Internet, Business opportunities.
Unit II: The mobile internet The Mobile Internet Standard; Making the Internet Mobile: Challenges and Pitfalls.
Unit III: WAP Overview of the Wireless Application Protocol
Unit IV: Implementing WAP services Location management, Transaction Management, The Wireless Markup Language, Enhanced WML: WML Script and WTAI, User Interface Design: Marking Wireless Applications Easy to Use.
Unit V: Advanced WAP Tailoring Content to the Client, Push Messaging, Wireless Telephony Applications. Ad-hoc networks.
Unit 6: The mobile internet future Building and Deploying End-to-End WAP Services; Where Next: The Mobile Internet Future

RECOMMENDED BOOKS:

TEXT BOOKS	1. Mobile Communications Design Fundamentals :William C Y Lee John Wiley, New York 2. Mobile Computing**:** Tomasz Imielinski and Henry F Korth Springer, New York
REFERENCE BOOKS	1. The Wireless Application Protocol-Writing Applications for Mobile Internet: Sandeep Singhal Pearson Education, New Delhi 2. Mobile computing : henry f. Korth: kluwar academic publisher

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BACHELOR OF COMPUTER APPLICATIONS
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	2	3	4					4	

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

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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French Language – Part 1

L	T	P
2	0	0

MODULE CODE	**LANF0107**
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75 (Written – 50, Oral – 25)
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 skills of expressing and exchanging information / interacting in French language and to enhance skills as mentioned below:

1. To prepare students to develop basic understanding on French language.
2. To acquire knowledge on French grammar.
3. To understand syntax and semantics of language.
4. To achieve an understanding on basic communication in French language.
5. To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.

LEARNING OUTCOMES:

1. Able to understand the basic grammar of French language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the basics of French language.
4. Able to understand the French history.

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MODULE CONTENTS

UNIT I:- BASIC COMMUNICATION – This module will develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: -

- Establish contact with someone
- Introduce self and others
- Greet, congratulate, and express condolences
- Spell
- Count
- Exchange simple information on self, preferences, feelings, plans, dreams
- Ask for information
- Tell the time
- Advice, order, suggest
- Buy, sell
- Make a reservation
- Order food or any article
- Invite, accept or refuse invitation
- Fix an appointment
- Locate a place
- Give directions
- Give chronological order of events
- Prepare an itinerary
- Ask for / Give explanations
- Describe a person, an object, an event, a place
- Describe the weather
- Compare

UNIT II: BASIC PHONETICS – This module will develop the ability in the students: -

- To pronounce words, say sentences, questions and give orders using the right accent and intonation.
- To express surprise, doubt, fear, displeasure and all positive or negative feelings using the right intonation
- To use 'liaison' and 'enchainment'
- To distinguish voiced and unvoiced consonants
- To distinguish between vowel sounds

UNIT III: BASIC GRAMMAR & FORMATION OF SENTENCES – This module will develops the ability in the students to construct sentences and frame questions using: -

- Nouns – gender and number
- Articles – definite and indefinite, partitif, articles contractés
- Pronouns – personal, relative (qui, que,où), y, en
- Verbs – conjugation of regular and irregular verbs (affirmative and negative) in the following tenses (indicative mood) – present, present continuous, simple future, immediate future, recent past, simple past, past continuous
- Verbs – the imperative mood
- Adjectives – numeric, qualitative, possessive, demonstrative, interrogative – gender and number

- Adverbs – simple adverbs of time, place, quantity
- Prepositions – simple prepositions (place, time)
- Interrogation – interrogative words, interrogative phrases, inversion

RECOMMENDED BOOKS:

TEXT BOOKS	1. Nouveau Sans Frontières 1 by Philippe Dominique & Jacky Girardet 2. "CONNEXIONS-1" by Regine Merieux & Yves Loiseau Published by Didier.
REFERENCE BOOKS	1. Five in one Multilingual Glossary, published by Saraswati House Pvt. Ltd. New Delhi 2011.

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

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	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

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;
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- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

German Language – Part 1

L	T	P
2	0	0

MODULE CODE	**LANG0108**
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75 (Written – 50, Oral – 25)
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 skills of expressing and exchanging information / interacting in German language and to enhance skills as mentioned below:

1. To prepare students to develop basic understanding on German language.
2. To acquire knowledge on German grammar.
3. To understand syntax and semantics of language.
4. To achieve an understanding on basic communication in German language.
5. To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.

LEARNING OUTCOMES:

1. Able to understand the basic grammar of German language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the basics of German language.
4. Able to understand the German history.

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BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENTS

UNIT I:- BASIC COMMUNICATION – This module will develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: -

- Establish contact with someone
- Introduce self and others
- Greet, congratulate, and express condolences
- Spell
- Count
- Exchange simple information on self, preferences, feelings, plans, dreams
- Ask for information
- Tell the time
- Advice, order, suggest
- Buy, sell
- Make a reservation
- Order food or any article
- Invite, accept or refuse invitation
- Fix an appointment
- Locate a place
- Give directions
- Give chronological order of events
- Prepare an itinerary
- Ask for / Give explanations
- Describe a person, an object, an event, a place
- Describe the weather
- Compare

UNIT II: BASIC PHONETICS – This module will develop the ability in the students: -

- To pronounce words, say sentences, questions and give orders using the right accent and intonation.
- To express surprise, doubt, fear, displeasure and all positive or negative feelings using the right intonation
- To use 'liaison' and 'enchainment'
- To distinguish voiced and unvoiced consonants
- To distinguish between vowel sounds

UNIT III: BASIC GRAMMAR & FORMATION OF SENTENCES – This module will develops the ability in the students to construct sentences and frame questions using: -

- Nouns – gender and number
- Articles – definite and indefinite, articles
- Pronouns – personal, relative
- Verbs – conjugation of regular and irregular verbs (affirmative and negative) in the following tenses (indicative mood) – present, present continuous, simple future, immediate future, recent past, simple past, past continuous
- Verbs – the imperative mood

• Adjectives – numeric, qualitative, possessive, demonstrative, interrogative – gender and number
• Adverbs – simple adverbs of time, place, quantity
• Prepositions – simple prepositions (place, time)
• Interrogation – interrogative words, interrogative phrases, inversion

RECOMMENDED BOOKS:

TEXT BOOKS	1. Tangram, Kursbuch und Arbeitsbuch, 1A, 1B & 2A, Max Hueber Verlag 2. Tangram, Kursbuch und Arbeitsbuch, 2B, 3A & 3B, Max Hueber Verlag
REFERENCE BOOKS	1. em Abschlusskurs, Kursbuch und Arbeitsbuch, Max Hueber Verlag

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

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

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BACHELOR OF COMPUTER APPLICATIONS

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

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;
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Spanish Language – Part 1

L	T	P
2	0	0

MODULE CODE	**LANS0109**
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75 (Written – 50, Oral – 25)
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 skills of expressing and exchanging information / interacting in Spanish language and to enhance skills as mentioned below:

1. To prepare students to develop basic understanding on Spanish language.
2. To acquire knowledge on Spanish grammar.
3. To understand syntax and semantics of language.
4. To achieve an understanding on basic communication in Spanish language.
5. To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.

LEARNING OUTCOMES:

1. Able to understand the basic grammar of Spanish language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the basics of Spanish language.
4. Able to understand the Spanish history.

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BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENTS

UNIT I:- BASIC COMMUNICATION – This module will develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: -

- Establish contact with someone
- Introduce self and others
- Greet, congratulate, and express condolences
- Spell
- Count
- Exchange simple information on self, preferences, feelings, plans, dreams
- Ask for information
- Tell the time
- Advice, order, suggest
- Buy, sell
- Make a reservation
- Order food or any article
- Invite, accept or refuse invitation
- Fix an appointment
- Locate a place
- Give directions
- Give chronological order of events
- Prepare an itinerary
- Ask for / Give explanations
- Describe a person, an object, an event, a place
- Describe the weather
- Compare

UNIT II: BASIC PHONETICS – This module will develop the ability in the students: -

- To pronounce words, say sentences, questions and give orders using the right accent and intonation.
- To express surprise, doubt, fear, displeasure and all positive or negative feelings using the right intonation
- To use 'liaison' and 'enchainment'
- To distinguish voiced and unvoiced consonants
- To distinguish between vowel sounds

UNIT III: BASIC GRAMMAR & FORMATION OF SENTENCES – This module will develops the ability in the students to construct sentences and frame questions using: -

- Nouns – gender and number
- Articles – definite and indefinite, articles
- Pronouns – personal, relative
- Verbs – conjugation of regular and irregular verbs (affirmative and negative) in the following tenses (indicative mood) – present, present continuous, simple future, immediate future, recent past, simple past, past continuous
- Verbs – the imperative mood

• Adjectives – numeric, qualitative, possessive, demonstrative, interrogative – gender and number
• Adverbs – simple adverbs of time, place, quantity
• Prepositions – simple prepositions (place, time)
• Interrogation – interrogative words, interrogative phrases, inversion

RECOMMENDED BOOKS:

TEXT BOOKS	1. Aula Internacional 1 and 2, Novellas and short stories 2. Aula Internacional 3, España and Latinoamérica: Historia y Cultura, Novellas
REFERENCE BOOKS	1. Español sin fronteras, I, SGEL, 1997 2. Nuevo Ven I, Edelsa 2004

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

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

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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

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:

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Aptitude – Part 1

L	T	P
2	0	0

MODULE CODE	VALU0119
CREDIT POINTS	2
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 analytical and business skills in Aptitude and to enhance skills as mentioned below:

1. To prepare students to develop basic understanding in Aptitude.
2. To acquire knowledge on various analytical tools.
3. To understand syntax and semantics of aptitude in business.

LEARNING OUTCOMES:

1. Able to understand the basic fundamentals & concepts of Aptitude.
2. Exposure to various analytical tools used in business.
3. Ability to use different mathematical techniques.
4. Able to understand the importance of aptitude.

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BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENTS

UNIT 1:- FUNDAMENTALS & USES OF ARITHMETIC-

Percentage, Ratio & Proportion: Percentage Meaning and Computations of Percentages, Definition **of** Ratio, Continued Ratio, Inverse Ratio, Definition **of** Proportion, Continued Proportion, Direct Proportion.

Profit And Loss : Terms and Formulae, Trade discount, Cash discount, Problems involving cost price, Selling Price, Trade discount and Cash Discount, Problems involving cost price, selling price, trade discount and cash discount.

Interest: Simple Interest, Compound Interest, Equated Monthly Instalments (EMI), Word Problems
Sequence and Series: AP, GP (simple word problems only).

Average: Definition, meaning and simple problems on average.

UNIT 2: DATA ANALYSIS-
To understand different types of data format.

To acquire skills for analyzing different data format.

To understand scope and limitations of data uses in business.

Bar graph: Reading and interpretation of bar graph in vertical forms, reading scales, creating bar graph from given data, solving problems using information presented in bar graph.

Table: Creating table from given data, Reading and interpreting table, solving problems using information presented in table.

Line graph: Reading and interpreting line graph, solving problems using information presented in line graph.

Shares and Dividends: Concept of shares, stock exchange, Face value, Market value, Dividend, Equity shares, Preferential shares, Bonus share with examples.

Matrices and Determinants : Definition of Matrix ,Types of Matrix, Algebra of Matrix (Addition and Multiplication), Determinant, Adjoint of Matrix, Inverse of Matrix via Adjoint matrix, Solving simultaneous equations(Order3).

UNIT4:
Assignment 1,
Assignment2,
Project

RECOMMENDED BOOKS:

TEXT BOOKS	1. R S Agarwal quantitative aptitude book 2. Abhijit Guha quantitative aptitude book
REFERENCE BOOKS	1. Aptitude books by Arihant publication

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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

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

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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PROGRAM SCHEME

SEMESTER – IV

BCA SEMESTER - IV										
MODULE CODE	**CATEGORY**	**SUB-CATEGORY**	**MODULE**	**L**	**T**	**P**	**C**	**MARKS**		
								INTERNAL	**EXTERNAL**	**TOTAL**
COAP2111	BCA	PC	SOFTWARE ENGINEERING	3	1	0	3.5	30	70	100
COAP2112	BCA	PC	VB.NET	4	0	0	4	30	70	100
COAP2113	BCA	PC	VB.NET LAB	0	0	4	2	30	70	100
COAP2114	BCA	PC	UNIX AND SHELL PROGRAMMING	4	0	0	4	30	70	100
COAP2115	BCA	PC	UNIX AND SHELL PROGRAMMING LAB	0	0	4	2	30	70	100
	BCA	PE	ELECTIVE-III***	3	1	0	3.5	30	70	100
COAP2119	BCA	PD	SPECIALIZED MINOR PROJECT (INDIVIDUAL)	0	0	4	2	50		50
	BCA	GE	ELECTIVE - Aᵠ	4	0	0	4	30	70	100
	G		FOREIGN LANGUAGE PART-II#	2	0	0	2	25	50	75
VALU0123	P	SE	PROFESSIONAL COMMUNICATION-II	2	0	0	2	25	50	75
ENGL0109	P	AE	ACADEMIC WRITING	0	0	2	1	25		25
TOTAL CREDITS				**22**	**2**	**14**	**30**	**TOTAL MARKS**		**925**

ELECTIVES	
MODULE CODE	**ELECTIVE-III****
COAP2206	DATA COMMUNICATION AND NETWORKING
COAP2207	ADVANCED SYSTEM ADMINISTRATION
COAP2208	DATAWAREHOUSE AND MINING

MODULE CODE	**MODULE NAME**
LANF0110	FRENCH
LANG0111	GERMAN
LANS0112	SPANISH

MODULE CODE	**GENERIC ELECTIVES-Aᵠ**
SAPM0321	SAP (ABAP)
SAPS0322	SAP (MM)
SAPF0323	SAP (SD)
ONE/TWO MOOCS MODULES(Consisting 4 credits in total)	
ᵠAdditional fee, if any, shall be borne by the student.	

SEMESTER – IV

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

SOFTWARE ENGINEERING **L T P**

3 1 0

MODULE CODE	COAP2111
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:

To know entire Software development Process, Software Project Management & Risk management and how a software should be developed based on a set of procedures so that it can comply with some predefined standards. The educational objectives of the P.D.M University Software Engineering Program are to produce graduates who, within three years after graduation, are able to:

1. Be employed in industry, government, or entrepreneurial endeavours to demonstrate professional advancement through significant technical achievements and expanded leadership responsibility.
2. Demonstrate the ability to work effectively as a team member and/or leader in an ever-changing professional environment; and
3. To know how to develop the software using various SDLC Model and how a better quality s/w can be develop within time period and budget.

LEARNING OUTCOMES:

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

1. Understand and analyze how SDLC play a huge role in developing a Software.
2. Able to analyze various risk issues and how it can be resolved by using Software Project Management.
3. Understand various Qualities & Maintenance issues in Software Development
4. Deal with Software Matrices and Software Testing & how debugging will be carried out.
5. Know the Recognition of the need for, and an ability to engage in, life-long learning.

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MODULE CONTENT:

Unit-I: Introduction Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models. Software Requirements Analysis & Specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS .
Unit-II: Computer based System Engineering Systems and their environment, System Procurement, System Engineering Process, System architecture modelling. Human Factors, System reliability Engineering. Requirements and Specification: The requirement Engineering Process, The Software requirement document,
Unit-III: Software Project Management Concepts: The Management spectrum, The People the Problem, The Process, The Project. Software Project Scheduling: Basic concepts and principles of project scheduling; Defining task set and task network; Scheduling; Earned value analysis. Risk Management: Reactive versus proactive strategies; S/W Quality Management. Software Project Planning: Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO,
Unit-IV: Software Risk Management. S/W risks, risk identification; Risk projection; Risk refinement; Risk mitigation, monitoring and management. Software Prototyping: Prototyping in software process, Prototyping techniques, User interface prototyping. Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design,
Unit-V: Software Metrics Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style.
Unit-VI: Software Verification and Validation S/W testing Process, Test Planning & Strategies, Black Box, Structural, interface testing, Program inspections, mathematically based verification, Static analysis tools, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing, Debugging Activities. Software Reliability and reusability: Software reliability metrics, Software reliability Specification, Fault avoidance & tolerance, Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

RECOMMENDED BOOKS:

TEXT BOOK	1. Ian Sommerville – Software Engineering, 9th Edition, Pearson Education Ltd, 2010.
REFERENCE	1. Roger S. Pressman – Software Engineering, A Practitioner's approach, 7th Edition, McGRAW-HILL Publication, 2010. 2. Pankaj Jalote, "An integrated approach to Software Engineering", 3rd Edition, Narosa Publishing House, 2013. 3. Pressman : Software Engineering, TMH.

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	10
2.	Sessional Test	2	10
3.	Group Discussion	2	10
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	x	x
Quiz	x	x			
Assignment	x	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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

VB.NET

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

MODULE CODE	COAP2112
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. Introduction to Networking and the world wide web.
2. Building multi-tier enterprise applications.
3. Introduction to the .NET framework.
4. .NET Interoperation services.
5. Client side programming: HTTP, CGI, Cookies, JavaScript, HTML, XML.
6. Server side programming: Web Forms, ASP.NET Web Services, ADO.NET Data Access
7. Client/Server Programming, 3-tier architecture.

LEARNING OUTCOMES:

Following this course students will be able to:

1. Understand the programming algorithm, process, and structure.
2. Understand and identify the fundamental concepts of object-oriented programming.
3. Understand and use the concepts of objects, primitive value, message, method, selection control structure, repetition control structures, object reference, container, and method parameter.
4. Know how to write and run a complete program .
5. Understand and identify the importance of object-oriented programming for the internetbased electronic commerce.
6. Understand the impact of java and vb.net on business

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BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENT:

UNIT-I: Visual Basic .NET and the .NET Framework Introduction to .net framework -Features, Common Language Runtime (CLR) ,Framework Class Library(FCL).Visual Studio.Net – IDE, Languages Supported, Components. Visual Programming, VB.net-Features, IDE- Menu System, Toolbars, Code Designer, Solution Explorer, Object Browser, Toolbox, Class View Window, Properties Window, Server Explorer, Task List, Output Window, Command Window.
UNIT-II: Elements of Visual Basic .net Properties, Events and Methods of Form, Label, TextBox, ListBox, Combo Box, Radio Button, Button, Check Box, Progress Bar, Date Time Picker, Calendar, Picture Box, HScrollbar, VScrollBar, Group Box, ToolTip, Timer.
UNIT-III: Programming in Visual basic .net Data Types, Keywords, Declaring Variables and Constants, Operators, Understanding Scope and accessibility of variables, Conditional Statements- If- Then, If-Then-Else, Nested If, Select Case, Looping Statement- Do loop, For Loop, For Each-Next Loop, While Loop, Arrays- Static and Dynamic.
UNIT-IV :Functions, Built-In Dialog Boxes, Menus and Toolbar Menus and toolbars- Menu Strip, Tool Strip, Status Strip, Built-In Dialog Boxes –Open File Dialogs, Save File Dialogs, Font Dialogs, Color Dialogs, Print Dialogs, Input Box, Msg Box, Interfacing With End user- Creating MDI Parent and Child, Functions and Procedures- Built-In Functions-Mathematical and String Functions, User Defined Functions and Procedures.
UNIT-V: Advanced Concepts in VB.Net Object Oriented Programming- Creating Classes , Objects, Fields, Properties, Methods, Events , Constructors and destructors, Exception Handling- Models ,Statements.
UNIT-VI :File Handling Using File Stream Class, File Mode, File Share, File Access Enumerations, Opening or Creating Files with File Stream Class, Reading and Writing Text using Stream Reader and Stream Writer Classes, Data Access withADO.Net – What are Databases?, Data Access with Server Explorer, Data Adapter and Data Sets, ADO.NET Objects and Basic SQL

RECOMMENDED BOOKS

TEXT BOOK	1. Visual Basic.Net Black Book by Steven HolznerDreamtech Press 2. The Complete Reference Visual Basic .NET Jeffery R. Shapiro Tata McGraw Hills
REFERENCE BOOK	1. Murach's Beginning Visual basic .Net By Anne Bohem

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).

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

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	3					

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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

VB.NET LAB

L	T	P
0	0	4

MODULE CODE	COAP2113
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. More easily align objectives with course content and evaluation methods;
2. Clearly communicate your expectations of students;
3. Establish a logical sequence of learning milestones;
4. Allow both you and your students to self-evaluate based on stated expectations;
5. Provide an opportunity for students to make connections across courses and institutional goals.

LEARNING OUTCOMES:

Following this course, students will be able to:

1. Demonstrate knowledge of relevant subject matter described in the American Council for Construction Education (ACCE) guidelines.
2. Demonstrate leadership qualities through experiential learning.
3. Apply various techniques and methods to efficiently and effectively plan and control construction projects.
4. Understand the value of and apply sustainable building practices to optimize use of available resources.

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BACHELOR OF COMPUTER APPLICATIONS

LIST OF EXPERIMENTS

1.	Write a program in vb.net string length
2.	Write a program in vb.net array list
3.	Write a program in vb.net stack
4.	Write a program in vb.net queue
5.	Write a program in vb.net MDI form
6.	Write a program in vb.net list box control
7.	Write a program in vb.net check box control
8.	Write a program in vb.net menu control
9.	Write a program in vb.net color dialog box
10.	Write a program in vb.net exception
11.	Write a program in vb.net access specifiers
12.	Write a program in vb.net text box control
13.	Write a program in vb.net picture box control
14.	Write a program in vb.net tree view control
15.	Write a program in vb.net ADO. Net data set
Experiments based on advanced topics:	
16.	Write a program in vb.net remote listener application
17.	Write a program in vb.net filter data in an xml

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

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BACHELOR OF COMPUTER APPLICATIONS

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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

UNIX AND SHELL PROGRAMMING

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

MODULE CODE	
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:

- UNIX Commands
- Shell Programming

LEARNING OUTCOMES:

Following this course students will be able to:

1. Learn about the Architecture of unix
2. Lear basic working commands of unix
3. Understand the shells and system adminstration
4. Learn the basic linux
5. Shell programming

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENT:

Unit 1: UNIX and LINUX Overview of UNIX and LINUX Architectures editors and commands, shell scripts, system administration.
Unit-II: LINUX Internals Introduction: - Data structures in LINUX kernel, process management, systems calls.
Unit III: Memory management Architecture independent memory model, virtual address space for a process, block devices, caching, paging under LINUX.
Unit 4: Inter process communication Synchronization in kernel, communication via files, pipes, ptrace, system V IPC, and sockets. management and structures, Memory allocation and deallocation: malloc() and free() functions.
Unit 5: LINUX file system 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 6: Multiprocessing Multiprocessing, symmetric multiprocessing, Changes with respect to kernel initialization, spooling, message exchange between processes, interrupt handling.

RECOMMENDED BOOKS:

TEXT BOOKS	1.Operating System Concepts: A Silberschatz P B Galvin John Wiley and Sons (Asia) Pvt. Ltd 2.Beginning Linux Programming: Neil Mathew and Richard Stones Wiley Dream Tech
REFERENCE BOOKS	1.The UNIX Programming Environment: B W Kernighan and R Pike Prentice Hall of India, New Delhi. 2.Red Hat Linux Administrator's Guide: Cox K Prentice Hall of India, New Delhi

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	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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

UNIX AND SHELL PROGRAMMING LAB

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

MODULE CODE	COAP2115
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 unix operating system.
2. Acquire knowledge basic commands
3. Get familiar with the concepts of shells and permission system
4. Enable learner to understand shell programming.

LEARNING OUTCOMES:

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

1. Practical knowledge and use of the unix operating system.
2. Learning basic commands of unix os.
3. Handling unix and putty .
4. Learn about shells .
5. Use of Basic functions and formulas.
6. Create shell programs

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

LIST OF EXPERIMENTS

1.	Learn about unix operating system.
2.	Learn basic unix commands
3.	Learn about vi editor
4.	Write a program to display “Hello World” message
5.	Write a program to add two numbers.
6.	Write a program to find the largest between two numbers
7.	Write a program to create functions for addition , multiplication and division operation.
8.	Write a program to find factorial of a number
9.	Write a program to find hcf of two numbers.
10.	Write a shell script to print the first n Fibonacci numbers..
11.	Write a shell script to determine whether a given number is a prime number or not.
12.	Write a shell script which displays the list of all files in a given director
Experiments based on advanced topics:	
13.	Write a shell script (small calculator) that adds, subtracts, multiplies and divides the two given numbers.
14.	Write a shell script to generate a multiplication table.

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).

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, 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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

DATA COMMUNICATION AND NETWORKING **L T P**

3 1 0

MODULE CODE	COAP2206
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. Networking media
2. Multiplexing ,FDM, WDM ,TDM, FDM
3. Data Link control Protocols
4. Routing algorithms.
5. Transport and upper layer of network

LEARNING OUTCOMES:

Following this course, students will be able to:

1. Understand fundamentals of networking.
2. Understand fundamentals of topologies
3. Understand OSI/ TCP models
4. Explain modem/ repeaters and routing algorithms.
5. Understand the routers.

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BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENT:

Unit I: Data Transmission/The Physical Layer: Concepts and Terminology, Analog and Digital Data Transmission, Transmission Impairments, Guided Transmission Media, Wireless Transmission, Communication Satellites, The Public Switched Telephone Network, The Mobile Telephone System, Cable Television Data Encoding:Digital Data: Digital and Analog Signals, Analog Data: Digital and Analog Signals, Spread Spectrum
Unit II: Data Communication Interface: Asynchronous and Synchronous Transmission, Line Configurations, Interfacing Multiplexing: Frequency-Division Multiplexing, Synchronous Time-Division Multiplexing, Statistical TimeDivision Multiplexing Circuit Packet and Switching: Switched Networks, Circuit-Switching Networks, Switching Concepts, Routing in Circuit-Switched Networks, Control Signaling, Packet-Switching Principles, Routing, Congestion Control, X.25 282
Unit III: Frame Relay: Frame Relay Protocol Architecture, Frame Relay Call Control, User Data Transfer, Network Function, Congestion Control LAN Technology and Systems: LAN Architecture, BusITree LANs, Ring LANs, Star LANs, Wireless LANs, Ethernet and Fast Ethernet (CSMAICD), Token Ring and FDDI, 100VG-AnyLAN, ATM LANs, Fibre Channel, Wireless LANs, Bridge Operation, Routing with Bridges
Unit IV: Protocols and Architecture: Protocols, OSI, TCP/IP Protocol Suite Examples of networks: Novell Netware, Arpanet, and Internet. Examples of Data Communication Services: X.25 Networks, Frame relay, Broad band ISDN and ATM. -
Unit V: Physical Layer: Transmission media- Narrow band ISDN: Services-Architecture- Interface, Broad band ISDN and ATM- Virtual Circuits versus Circuit Switching – Transmission in ATM networks. FDDI Link Layer and Local Area Networks Data link layer: Service provided by data link layer-Error detection and correction Techniques-Elementary data link layer protocols -Sliding Window protocols
UNIT-VI: Data link layer in HDLC, Internet and ATM . Multiple Access protocols: Channel partitioning protocols: TDM-FDM-Code Division Multiple Access(CDMA) .Random Access protocols : ALOHACSMA and CSMA/CD . Local area Network: LAN addresses- Address Resolution Protocol-Reverse Address Resolution Protocol. Ethernet: Ethernet Technologies-IEEE standards- Hubs-Bridges and Switches.

RECOMMENDED BOOKS

TEXT BOOK	1. Computer Networks: A S Tanenbaum Pearson Education, Asia 2. Data Communication and Networking: Behrouz A Forouzan 3rd edition Tata McGraw Hill, New Delhi.
REFERENCE BOOK	1. Internetworking with TCP/IP: D E Comer, Pearson Education, Asia 2. Data and Computer Communications: William Stallings Pearson Education, Asia 3. Networking : The completer Reference : Zacker Tata McGraw Hill, New Delhi

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		
Quiz	x		x		
Assignment	x	x	x	x	

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

MAPPING OF COURSE LEARNING OUTCOMES

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

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.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

ADVANCED SYSTEM ADMINISTRATION **L T P**
3 1 0

MODULE CODE	COAP2207
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. UNIX Standardization and Implementations.
2. UNIX File I/O Section.
3. UNIX Files and Directories.
4. System Data Files and Information.

LEARNING OUTCOMES:

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

1. Practical knowledge and use of the Linux operating system.
2. Creating File and Directories in Linux.
3. Use of Basic functions of Linux
4. Use of UNIX Standardization.

PDM UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS

MODULE CONTENT:

UNIT-I: UNIX System Overview Introduction, UNIX Architecture, Logging In, Files and Directories, Input and Output, Programs and Processes, Error Handling, User Identification, Signals, Time Values, System Calls and Library Functions.
UNIT-II: UNIX Standardization and Implementations Introduction, UNIX Standardization, UNIX System Implementations, Relationship of Standards and Implementations, Limits, Options, Feature Test Macros, Primitive System Data Types.
UNIT-III: File I/O Section Introduction, File Descriptors, open Function, create Function, close Function, lseek Function, read Function, write Function.
UNIT-IV: Files and Directories Introduction, stat, fstat, and lstat Functions, File Types, Set-User-ID and Set-Group-ID, File Access Permissions, Ownership of New Files and Directories, access Function, umask Function, chmod and fchmod Functions.
UNIT-V: Standard I/O Library Introduction, Streams and FILE Objects, Standard Input, Standard Output, and Standard Error, Buffering, Opening a Stream, Reading and Writing a Stream.
UNIT-VI: System Data Files and Information Introduction, Password File, Shadow Passwords, Group File, Supplementary Group IDs.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Advanced Programming in the UNIX® Environment: Second Edition By W. Richard Stevens, Stephen A. Rago, Addison Wesley Professional.
REFERENCEBOOKS	1. The Linux Programming Interface by Michael Kerrisk 2. Understanding the Linux Kernel by Daniel Bovet and Marco Cesati

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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		2		4			3		2,4

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;
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- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

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DATA WAREHOUSE AND MINING

L	T	P
3	1	0

MODULE CODE	COAP2208
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. The contribution of data warehousing and data mining to the decision support level of organizations.
2. Different models used for OLAP and data pre-processing.
3. Different data mining techniques: mining frequent pattern, association, correlation, classification, prediction, and cluster analysis.
4. Principles of dimensional modelling.
5. Steps for the Design and Construction of Data warehouse.

LEARNING OUTCOMES:

Following this course, students will be able to:

1. Understand fundamentals of Datware Housing & Data Mining Techniques.
2. Understand STAR schema, STAR Schema Keys, Advantages of the STAR Schema.
3. Dimensional Modeling: Updates to the Dimension tables, miscellaneous dimensions, the snowflake schema, aggregate fact tables, families of STARS.
4. Understand Concept hierarchy.
5. Knowledge about Data-mining.
6. Understand various data-miming techniques like association, classification, clustering.

MODULE CONTENT:

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Unit I: The compelling need for data warehousing Escalating Need for strategic information, failures of Past decision-support systems, operational versus decision-support systems, data warehousing –the only viable solution, data warehouse defined
Unit II: Data warehouse – The building blocks Defining Features, data warehouses and data marts, overview of the components, metadata in the data warehouse Defining the business requirements: Dimensional analysis, OLAP operations : Drilldown and roll-up, slice-and-dice or rotation.
Unit III: : Principles of dimensional modeling The STAR schema, STAR Schema Keys, Advantages of the STAR Schema Dimensional Modeling: Updates to the Dimension tables, miscellaneous dimensions, the snowflake schema, aggregate fact tables, families of STARS.
Unit IV: : Steps for the design and construction of data warehouse Framework, Architecture, Type of OLAP Servers: ROLAP, MOLAP, Data warehouse implementation tolls and techniques.
Unit V: Data mining Data Mining of what kind of Data , Knowledge discovery process (KDD) , What kind of patterns can be mined , OLAP versus data mining, data mining and the data warehouse, Data mining functionalities, classification Systems.
UNIT-VI: Data processing Cleaning, Integration and transformation, Reduction, Data Mining primitives: What defines a Data Mining Task. Benefits of data mining and applications.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Data Mining Concepts and Techniques Kamber and Han Hartcourt India P. Ltd, Singapore 2. Fundamentals of Data Warehousing :Paul Raj Poonia John Wiley and Sons, U S A

REFERENCEBOOKS	1. Building the Operational Data Store :W H Inmon Wiley, USA 2. Decision Support Systems :Sam Anahony John Wiley, USA 3. Fundamentals of Data Warehouse :Jarke Springer, New York 4. Introduction to Data Mining with Case Studies :G K Gupta Prentice Hall of India, New Delhi 5. Data Mining Methods and Techniques :A B M Shawkat Ali and Saleh A WasimiCengage, New Delhi 6. Pang - Ning, Michael- Steinbach, "Introduction to Data Mining" Pearson, New Delhi

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**
Quiz		**x**	**x**		**x**	**x**
Assignment					**x**	

MAPPING OF COURSE LEARNING OUTCOMES

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

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;
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SAP (ABAP/MM/SD)

L	T	P
4	0	0

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

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ONE/TWO MOOCS MODULES

L	T	P
4	0	0

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

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FRENCH LANGUAGE – PART 2 **L T P**

Pre-requisite - French Language – Part 1 2 0 0

MODULE CODE	LANF0101
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75 (Written – 50, Oral – 25)
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 skills of expressing and exchanging information / interacting in French language and to enhance skills as mentioned below:

1. To prepare students to develop advance understanding on French language.
2. To acquire the command over the French grammar.
3. To read and write short, simple texts.
4. To enable learner to build logic in French language.
5. To make students aware of the French culture, customs & traditions.

LEARNING OUTCOMES:

1. Able to understand the advance grammar of French language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the advance of French language.
4. Able to understand the French history.

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MODULE CONTENTS

UNIT I: MODERATE COMMUNICATION – This module will sharpen the communicative skills already acquired in the **PART 1 - BASIC COMMUNICATION** and further builds on them. It develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: -

- Describe in detail people, relationships, events, places, cultures of countries
- Compare people, relationships, events, places, cultures and the changes that they have undergone
- Apply for a job
- Exchange personal and professional information
- Express opinion on people, places, events encountered in one's personal life and on press articles, television programmes, multimedia, films, and books
- Argue, justify and substantiate a point of view
- Describe hypothetical or imaginary situations
- Express plans, dreams, aspirations of the future
- Paragraph writing
- Professional communication

UNIT II: MODERATE PHONETICS – This module will re-enforces all the notions introduced in the **PART 1- BASIC PHONETICS**.

UNIT III: MODERATE GRAMMAR – This module will sharpen the concepts introduced in the **PART 1 - BASIC GRAMMAR & FORMATION OF SENTENCES** and further develops the following linguistic skills: -

- Pronouns – relative (don't), possessive, indefinite, demonstrative and the use of double pronouns
- Verbs – conjugation of regular and irregular verbs (affirmative and negative) in the following tenses (indicative mood) – past perfect, future perfect
- Verbs – the subjunctive mood (past and present)
- Verbs – conditional (past and present) and gerund forms,
- Adverbs of time, place, quantity and indefinite adverbs
- Direct/indirect speech
- Comparative and superlative structures
- Active/passive structures
- Multiple clause sentences – independent clauses joined by co-ordinating conjunctions, dependant clause (subordinate clause)
- Phrases to express cause, consequence, and objective

RECOMMENDED BOOKS:

TEXT BOOKS	1. Nouveau Sans Frontières 1 by Philippe Dominique & Jacky Girardet 2. "CONNEXIONS-1" by Regine Merieux & Yves Loiseau Published by Didier.
REFERENCE BOOKS	1. Five in one Multilingual Glossary, published by Saraswati House Pvt. Ltd. New Delhi 2011.

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

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

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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GERMAN LANGUAGE – PART 2 **L T P**
Pre-requisite - German Language – Part 1 2 0 0

MODULE CODE	LANG0102
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75 (Written – 50, Oral – 25)
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 skills of expressing and exchanging information / interacting in German language and to enhance skills as mentioned below:

1. To prepare students to develop advance understanding on German language.
2. To acquire the command over the German grammar.
3. To read and write short, simple texts.
4. To enable learner to build logic in German language.
5. To make students aware of the German culture, customs & traditions.

LEARNING OUTCOMES:

1. Able to understand the advance grammar of German language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the advance of German language.
4. Able to understand the German history.

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MODULE CONTENTS

UNIT I: MODERATE COMMUNICATION – This module will sharpen the communicative skills already acquired in the **PART 1 - BASIC COMMUNICATION** and further builds on them. It develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: -

• Describe in detail people, relationships, events, places, cultures of countries
• Compare people, relationships, events, places, cultures and the changes that they have undergone
• Apply for a job
• Exchange personal and professional information
• Express opinion on people, places, events encountered in one's personal life and on press articles, television programmes, multimedia, films, and books
• Argue, justify and substantiate a point of view
• Describe hypothetical or imaginary situations
• Express plans, dreams, aspirations of the future
• Paragraph writing
• Professional communication

UNIT II: MODERATE PHONETICS – This module will re-enforces all the notions introduced in the **PART 1- BASIC PHONETICS**.

UNIT III: MODERATE GRAMMAR – This module will sharpen the concepts introduced in the **PART 1 - BASIC GRAMMAR & FORMATION OF SENTENCES** and further develops the following linguistic skills: -

• Pronouns – relative (don't), possessive, indefinite, demonstrative and the use of double pronouns
• Verbs – conjugation of regular and irregular verbs (affirmative and negative) in the following tenses (indicative mood) – past perfect, future perfect
• Verbs – the subjunctive mood (past and present)
• Verbs – conditional (past and present) and gerund forms,
• Adverbs of time, place, quantity and indefinite adverbs
• Direct/indirect speech
• Comparative and superlative structures
• Active/passive structures
• Multiple clause sentences – independent clauses joined by co-ordinating conjunctions, dependant clause (subordinate clause)
• Phrases to express cause, consequence, and objective

RECOMMENDED BOOKS:

TEXT BOOKS	3. Tangram, Kursbuch und Arbeitsbuch, 1A, 1B & 2A, Max Hueber Verlag 4. Tangram, Kursbuch und Arbeitsbuch, 2B, 3A & 3B, Max Hueber Verlag
REFERENCE BOOKS	2. em Abschlusskurs, Kursbuch und Arbeitsbuch, Max Hueber Verlag

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

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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SPANISH LANGUAGE – PART 2 **L T P**
Pre-requisite - Spanish Language – Part 1 2 0 0

MODULE CODE	LANS0103
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75 (Written – 50, Oral – 25)
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 skills of expressing and exchanging information / interacting in Spanish language and to enhance skills as mentioned below:

1. To prepare students to develop advance understanding on Spanish language.
2. To acquire the command over the Spanish grammar.
3. To read and write short, simple texts.
4. To enable learner to build logic in Spanish language.
5. To make students aware of the Spanish culture, customs & traditions.

LEARNING OUTCOMES:

1. Able to understand the advance grammar of Spanish language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the advance of Spanish language.
4. Able to understand the Spanish history.

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MODULE CONTENTS

UNIT I: MODERATE COMMUNICATION – This module will sharpen the communicative skills already acquired in the **PART 1 - BASIC COMMUNICATION** and further builds on them. It develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: -

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- Compare people, relationships, events, places, cultures and the changes that they have undergone
- Apply for a job
- Exchange personal and professional information
- Express opinion on people, places, events encountered in one's personal life and on press articles, television programmes, multimedia, films, and books
- Argue, justify and substantiate a point of view
- Describe hypothetical or imaginary situations
- Express plans, dreams, aspirations of the future
- Paragraph writing
- Professional communication

UNIT II: MODERATE PHONETICS – This module will re-enforces all the notions introduced in the **PART 1- BASIC PHONETICS**.

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- Verbs – the subjunctive mood (past and present)
- Verbs – conditional (past and present) and gerund forms,
- Adverbs of time, place, quantity and indefinite adverbs
- Direct/indirect speech
- Comparative and superlative structures
- Active/passive structures
- Multiple clause sentences – independent clauses joined by co-ordinating conjunctions, dependant clause (subordinate clause)
- Phrases to express cause, consequence, and objective

RECOMMENDED BOOKS:

TEXT BOOKS	5. Aula Internacional 1 and 2, Novellas and short stories 6. Aula Internacional 3, España and Latinoamérica: Historia y Cultura, Novellas
REFERENCE BOOKS	3. Español sin fronteras, I, SGEL, 1997 4. Nuevo Ven I, Edelsa 2004

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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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

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:

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SPECIALIZED MINOR PROJECT (INDIVIDUAL) **L T P**

0 0 4

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

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L	T	P
0	0	2

Academic Writing-I

MODULE CODE	ENGL0109
CREDIT POINTS	1
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	
END SEMESTER EXAM DURATION	Viva-voice

MODULE CONTENTS

1. Notice/Business Letter/Memo
2. Idioms and Phrases
3. Role Play
4. Introduction and Presentation
5. Tenses
6. Quotes