PDM UNIVERSITY
M.Sc. in Information Technology (IT)

SEMESTER – I

PROGRAMMING WITH C

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

MODULE CODE	**COIT5101**
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 students with basic concepts of computer programming and developer tools and teach students how to design, write and Execute a Program in 'C'.

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

LEARNING OUTCOMES:

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

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MODULE CONTENT:

Unit-I: Computers Introduction; block diagram; Hardware and software components; Programming paradigms; Program development cycle; Evolution of programming languages; Principles of structured programming; Sequential, selective and repetitive structures; Examples for modular programming ; Functions and procedures ; Examples of parameter passing methods.
Unit-II: C Language Fundamentals Character set; Various constants; keywords; Primitive data types: Declaration; Syntax for sequential, selective and repetitive structures; Sample codes for each.
Unit-III: Functions and arrays Functions: Definition, prototypes, block structure, call by value, by reference , recursive function; Arrays: Declaration, accessing array elements and initialization, passing array elements, one dimensional, two dimensional arrays, arrays with pointers, passing arrays to functions; Storage Classes: Uses and their types.
Unit-IV: Pointers Address and indirection operators; Pointer type declaration; Assignment; Initialization: Pointer arithmeti; Pointer with array; Pointer with function; String with pointers; Pointer to pointer; Dynamic memory management.
Unit-V: Structures Variables; Accessing members; Assignment and nesting; Pointers to Structures; Structures with functions; Structures with array; Unions; Bitwise operations.
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.** Problem Solving and Program Design in C: J.R. Hanly and E.B. Koffman, 6th Edition, 2009, Pearson Education. 2. C programming for the absolute beginner: M.A. Vine, 2nd Edition, 2008, Thomson Course Technology. 3. Computer Science: A Structured Programming Approach Using C: B.A. Forouzan and R.F. Gilberg, 3rd Edition, 2005, Thomson Course Technology. 4.
REFERENCEBOOKS	1. Schaum's Outline of Programming with C: B. Gottfried,, 2nd Edition, 1996, Tata McGraw Hill. 2. The C Programming Language: B.W. Kerninghan, D.M. Ritchie, 2nd Edition, 1995, 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

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
M.Sc. in Information Technology (IT)

PROGRAMMING WITH C LAB

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

MODULE CODE	**COIT5102**
CREDIT POINTS	2
FORMATIVE ASSESSMENT MARKS	30
SUMMATIVE ASSESSMENT MARKS	70
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES

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

LEARNING OUTCOMES

Following this course, students will be able to:

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

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LIST OF EXPERIMENTS

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

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MS OFFICE AND WEB TECHNOLOGIES

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

MODULE CODE	**COIT5103**
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. 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
5. Thorough understanding of HTML and DHTML

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, Knowledge of mail merge.
3. Formatting techniques and presentation styles.
4. Use of Basic functions and formulas.
5. Using excel workbooks and templates.
6. How to design web page using HTML and DHTML.

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MODULE CONTENT:

UNIT-I: Documentation using Word Processor 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.
UNIT-II: Advance features of MS-Word Mail merge, Macros, Tables, File management, Printing, Styles, Linking and embedding object, Template.
UNIT-III: Electronic Spreadsheet 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.
UNIT-IV: 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: HTML Internet language; Understanding HTML; Create a web page; Linking to other web pages,; Publishing HTML pages; Text alignment and lists; Text formatting fonts control; E-mail links and link within a page; Creating HTML Forms.
UNIT-VI: Creating Web page Web page Graphics; Putting Graphics on a Web Page; Custom Backgrounds and Colors; Creating Animated Graphics; Web Page Design and layout: advanced layout with tables; using style sheets; Introduction to java script.

RECOMMENDED BOOKS:

TEXT BOOKS	5. Microsoft Office Complete Reference, BPB Publication 6. Learn Microsoft Office: Russell A. Stultz, BPB Publication 7. Tech Yourself HTML 4 in 24 Hours: Dick Oliver, Techmedia
REFERENCEBOOKS	1. Level Information Technology: Satish Jain **2.** 10 minutes Guide to HTML Style Sheets: Craig Zacker, 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

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		
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	3	1,2		3	4,5	3,4				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:

- 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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MS OFFICE AND WEB TECHNOLOGIES

L	T	P
0	0	4

MODULE CODE	**COIT5104**
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
5. Thorough understanding of HTML and DHTML

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, Knowledge of mail merge.
3. Formatting techniques and presentation styles.
4. Use of Basic functions and formulas.
5. Using excel workbooks and templates.
6. How to design web page using HTML and DHTML.

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LIST OF EXPERIMENTS

1.	How to Create, Edit and Format documents in MS Word.
2.	How to insert Header and footer in MS Word.
3.	How to use Drop 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.	**MS Access** • Working with tables • Working with forms • Designing a query • Creating reports
12.	Design a HTML page to illustrate body tag and all its attributes.
13.	Design a HTML page to illustrate ordered list and unordered list and definition list .
14.	Design a HTML page to illustrate the image ,anchor ,table tag.
15.	Design a HTML page to illustrate the form tag and the frame tag.
Experiments based on advanced topics:	
16.	To implement MS Office: 1.Develop a Minor Project for your college.
17.	To implement web designing concept: 1. Develop a web site for your college.

Note: At least 15 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.

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LOGICAL ORGANIZATION OF COMPUTER

L	T	P
4	0	0

MODULE CODE	**COIT5105**
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 & Learn to design combinational and digital circuits.
5. Learn Assembly and Microprocessor

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MODULE CONTENT:

UNIT-I: Information Representation Number Systems(decimal ,binary,octal and hexadecimal number system), Binary Arithmetic (addition , subtraction multiplication and division) Fixed-point and Floating point representation of numbers, BCD Codes, Error detecting and correcting codes, Character Representation – ASCII, EBCDIC, Unicode
UNIT-II: Introduction to Boolean Algebra Boolean Algebra, Boolean Theorems, Boolean Functions and Truth Tables K-map SOP form and POS form.
UNIT-III: Combination Circuits Basic gates , universal gates , circuit design, Multiplexes; Demultiplexers; Decoders; Adders, 7 segment display system.
UNIT-IV: Sequential Circuit Flip-flops: S-R, J-K, D, T, master slave and Edge triggered; Registers: Shift registers, bi-directional shift registers
UNIT-V: Input-Output 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;
UNIT-VI: Introduction to Microprocessor & Assemby language Introduction to 8086, Bus interface unit, addressing modes, introduction to assembly language.

RECOMMENDED BOOKS:

TEXT BOOKS	1 .M. Morris Mano, "Digital Logic and Computer Design", P rentice Hall of India Pvt. Ltd. 2. microprocessor 8086 by ramesh gaonka 3. M. Morris Mano, "Computer Architecture ", 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. 5. Microprocessor 8086 by ramesh gaonka

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 150 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
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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LOGICAL ORGANIZATION OF COMPUTER LAB

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

MODULE CODE	**COIT5106**
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 Assembly Program.
3. To develop analyzing and problem solving skills and use the same for writing programs in Assembly language.
4. To familiarize the trainee with basic concepts of computer programming and developer tools.
5. To present the syntax and semantics of the "Assembly of 8086" 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 MASM.
2. Deal with the basic scalar data types and their operators.
3. Know and Implement the Flow control.
4. Understand and Implement the Addressing modes
5. Structuring the code: Segmentation.
6. Do the Preprocessing of Source Code.

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LIST OF EXPERIMENTS

1.	Write a program to print "Hello World"
2.	Write a program to print a number.
3.	Write a program to sum of two numbers.
4.	Write a program to multiply two numbers.
5.	Write a program to subtraction of two numbers.
6.	Write a program to find out the greatest among 2 numbers.
7.	Write a program to find factorial of a number.
8.	Write a program to find largest among a list
9.	Write a program to concate two strings .
10.	Write a program to find out the greatest among 3 numbers.
11.	Write a program to find the average of the list values.
12.	Write a program to compute the simple interest .
Experiments based on advanced topics:	
16.	Write a program to make arithmetic calculator
17.	Write a program to create a file and copy it with new file

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	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
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SYSTEM ANALYSIS AND DESIGN

L	T	P
3	1	0

MODULE CODE	**COIT5107**
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 development life cycle
2. Different structured analysis tools
3. Cost and benefit analysis
4. Testing & implementation of test cases

LEARNING OUTCOMES:

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

1. Define and describe the five phases of the system development life cycle.
2. State at least five expected benefits from systems projects.
3. Explain at least three ways in which information systems support business requirements.
4. Describe how systems analysts interact with users, management, and other information systems professionals.
5. Develop data flow diagrams and decision tables.
6. Perform a feasibility study.

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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; Role of system analyst; Analyst/user interface. System planning and initial investigation: Introduction; Bases for planning in system analysis; Sources of project requests; Initial investigation; Fact finding; Information gathering; information gathering tools; Fact analysis; Determination of feasibility.
Unit II: Structured analysis, Tools of structured analysis DFD; Data dictionary; Flow charts; Gantt charts; Decision tree; Decision table.
Unit III: Feasibility study Introduction; Objective; Types; Steps in feasibility analysis; Feasibility report; Oral presentation; Cost and benefit analysis: Identification and classification of costs and benefits, methods of determining costs and benefits, interpret results of analysis.
Unit IV: System Design System design objective; Logical and physical design; Design methodologies; Structured design; Form-driven methodology; Structured walkthrough.
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.

RECOMMENDED BOOKS

TEXT BOOK	1. Systems Analysis and design by Elias M. Awad, Galgotia Pub.(P) Ltd. 2. Data Management and Data Structures by Loomis, PHI
REFERENCE BOOK	1. Introductory System analysis and Design by Lee, Vol. I & II.

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

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

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	3	2	1		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
M.Sc. in Information Technology (IT)

MATHEMATICAL FOUNDATION OF COMPUTER APPLICATION

L	T	P
3	1	0

MODULE CODE	**MATH0114**
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:

This course aims at providing the understanding of concepts and tools in discrete mathematics and their application to computers by mathematical definitions and proofs as well as applicable methods.

1. Introduce Mathematical fundamental of groups.
2. Introduce proof techniques such as Mathematical Induction and Contradiction.
3. Develop an understanding of counting, functions and relations.
4. Understand basic definitions and properties of Boolean algebra.
5. Have the knowledge of automata theory.

LEARNING OUTCOMES:

1. Understand the Visualize data numerically and/or graphically.
2. Understand the functions concepts and distinguish different types of functions. Identify and describe various types of relations. Develop the ability to solve the recurrence relations by using various methods.
3. Evaluate mathematical principles and logic design
4. Learn how use propositional logic.
5. Learn how to design and analyze automata theory.

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MODULE CONTENT:

UNIT-I: Sets and relations Introduction to set theory**;** Relations: Properties of binary relation, matrix representation of relations, closures of relations, equivalence relations, partial order relation.
UNIT-II: Functions Introduction to functions; Different **t**ypes of functions; Composition of functions; Recursively defined function.
UNIT-III: Algebraic Structres Properties; Semi group; Monoid; Group: Abelian group, subgroup, cyclic group; Cosets; Normal Subgroups; Lagrange's Theorem; permutation groups.
UNIT-IV: Propositional Logic Prepositions; Logical operations; Tautologies; Contradictions; Logical implication; logical equivalence; Normal forms; Theory of Inference and deduction; Predicate Calculus : Predicates and quantifiers; Mathematical Induction.
UNIT-V: Lattices and Boolean Algebra Partially Ordered Set; Hasse diagram; Well ordered set; Lattices: Properties of lattices, bounded lattices, complemented and distributive lattices; Boolean Algebra.
UNIT-VI: Formal Languages and Automata theory Introduction to defining language; Kleene Closure; Arithmetic expressions; Chomsky Hierarchy; Regular expressions; Generalized Transition graph; Conversion of regular expression to Finite Automata; NFA; DFA; Conversion of NFA to DFA; Optimizing DFA; FA with output : Moore machine, mealy machine, conversions.

RECOMMENDED BOOKS:

TEXT BOOKS	8. Elements of Discrete Mathematics: C.L.Liu, McGraw Hill. 9. Discrete Mathematics: Lipschutz, Seymour, Schaum's Series. 10. Discrete Mathematics: Babu Ram, Vinayek Publishers, New Delhi. 11. Discrete Mathematical Structure with Application to Computer Science: Trembley, J.P. & R. Manohar", TMH. 12. Discrete Mathematics and its applications: Kenneth H. Rosen, TMH. 13. Introduction to Automata theory,Languages and Computation: Hopcroft J.E., Ullman J.D, Narosa Publishing House, New Delhi.
REFERENCEBOOKS	1. Applied Discrete Structuresfor Computer Science: Doerr Alan & Levasseur Kenneth, Galgotia Pub. Pvt. Ltd. 2. Mathematical Structure for Computer Science: Gersting, WH Freeman & Macmillan.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support and text book / course material reading. 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	
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	3	1		3	4,5	3,4		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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SPECIAL PROBLEM

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

MODULE CODE	**COIT5108**
CREDIT POINTS	1
FORMATIVE ASSESMENT MARKS	
SUMMATIVE ASSESMENT MARKS	
END SEMESTER EXAM DURATION	
LAST REVISION DATE	

PDM UNIVERSITY
M.SC (INFORMATION TECHNOLOGY)

M.SC. IT PROGRAM SCHEME

SEMESTER II

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	MARKS		
								INTERNAL	EXTERNAL	TOTAL
COIT5109		PC	ARTIFICIAL INTELLIGENCE	4	0	0	4	30	70	100
COIT5110		PC	ARTIFICIAL INTELLIGENCE LAB	0	0	4	2	30	70	100
COIT5111		PC	DATA STRUCTURES USING C++	4	0	0	4	30	70	100
COIT5112		PC	DATA STRUCTURES USING C++ LAB	0	0	4	2	30	70	100
COIT5113		PC	PYTHON PROGRAMMING	4	0	0	4	30	70	100
COIT5114		PC	PYTHON PROGRAMMING LAB	0	0	4	2	30	70	100
COIT5115		PC	OPERATING SYSTEM	4	0	0	4	30	70	100
COIT5116		PC	SOFTWARE ENGINEERING	4	0	0	4	30	70	100
COIT5117	SP	SP	SEMINAR	0	0	2	1	50		50
TOTAL CREDITS				20	0	14	27	**TOTAL MARKS**		850

PDM UNIVERSITY
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ARTIFICIAL INTELLIGENCE

L	T	P
4	0	0

MODULE CODE	COIT5109
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. Problem solving methods.
2. Knowledge representation techniques.
3. Expert System.
4. Game playing using AI.
5. Natural language Processing.

LEARNING OUTCOMES:

1. Understand different types of AI agents.
2. Know various AI search algorithms (uninformed, informed, heuristic, constraint satisfaction, genetic algorithms).
3. Understand the fundamentals of knowledge representation.
4. Demonstrate working knowledge of reasoning in the presence of incomplete and/or uncertain information.
5. Basic techniques for automated reasoning, in particular search techniques and production systems.

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M.SC (INFORMATION TECHNOLOGY)

MODULE CONTENT:

UNIT-I: Introduction Introduction, AI problems, foundation of AI and history of AI, turing test. Intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, and problem formulation.
UNIT-II: Introduction Problem Solving, Search Algorithms, State-space Search; Evaluating Search Strategies- Time, Space, Completeness, Optimality. Uninformed search: Breadth First Search, Depth First Search, Iterative Deepening Search. Informed search: Best First Search, Heuristic Search, A* Search, optimality and admissibility. Hill Climbing, Local Search, local beam search.
UNIT-III: searching and Knowledge Representation Adversarial search: Game Playing, Min-max Algorithm, Alpha beta pruning. Knowledge representation: Level of representation, Knowledge representation schemes, Formal logic, Inference Engine, Semantic net, Frame, Scripts.
UNIT-IV: Using Logic Propositional logic Predicate logic: Skolemizing queries, Unification, Modus pones, Resolution, dependency directed back tracking. Rule Based Systems: Forward reasoning Conflict resolution, Backward reasoning, Forward & Backward. Chaining Use of non-back track.
UNIT-V: Natural language processing and learning Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing. Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning.
UNIT-VI: Expert system development life cycle Introduction, Representing using domain specific knowledge, Expert system shells, Architecture. Problem selection, Prototype construction, Formalization, Implementation, Evaluation, Knowledge acquisition: Knowledge engineer, Cognitive behaviour, Acquisition techniques.

RECOMMENDED BOOKS

TEXT BOOK	1. Artificial Intelligence, 1985: Elaine Rich, McGraw Hill. 2. Foundations of ArtificialIntelligence and expert systems: V.S. Janakiraman and K. Sarukesi
REFERENCE BOOK	1. Principles of Artificial Intelligence, 1992: Nilsson N.J. Narosa 2. Artificial Intelligence: A Modern Approach1995, Prentice Hall, Russell & Norvig.

PDM UNIVERSITY
M.SC (INFORMATION TECHNOLOGY)

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	2,4	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,
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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
M.SC (INFORMATION TECHNOLOGY)

ARTIFICIAL INTELLIGENCE LAB

L	T	P
0	0	4

MODULE CODE	COIT5110
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 'Prolog'

1. To understand how various AI Language works.
2. To understand some important applications of Prolog.
3. To familiarize how certain applications can benefit with AI.

LEARNING OUTCOMES:

At the end of this lab session, the student will

1. Be able to write programs in Prolog.
2. Be capable to identity goal for given problem.
3. Have practical knowledge on the application of AI using prolog.
4. Implement various games.

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M.SC (INFORMATION TECHNOLOGY)

LIST OF EXPERIMENTS

1.	Write A Simple Prolog Program To Study Fact, Verification, Domain, Predicate And Clauses Section.
2.	Program To Implement Water Jug Problem
3.	Program To Implement Monkey Banana Problem
4.	Program To Convert The String Given In Upper Case Letters Into Lower Case Letters And Vice-Versa.
5.	Wap For Using Input, Output And Fail Predicates In Prolog
6.	Accept Name Of The Student, Rollno, His Subject Name ,Maximum Marks And Obtained Marks In The Subject. Compute The Percentage Of A Student. Display His Result With Other Information.
7.	Accept Department, Designation, Name, Age, Basic Salary, House Rent Allowance(Hra) Of An Employee . Compute Dearness Allowance (Da) Which Is 15% Of Basic Salary . Determine The Gross Salary(Basic Salary+Hra+Da) Of The Employee. Display All Information Of The Employee.
8.	Write Program To Study Usage Of Cut,Not,Fail Predicates In Prolog
9.	Write Program To Study Usage Of Recursion In Prolog
10.	Write A Program To Find The Greatest Of Three Numbers.
11.	Program To Enter The Login Details.
12.	Program To Show The Compound Predicates.
13.	Program to Show the use of list.
14.	Program to solve the Quadratic Equation.
15.	Program To Implement Water Jug Problem
16.	Program To Implement Monkey Banana Problem

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).

PDM UNIVERSITY
M.SC (INFORMATION TECHNOLOGY)

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	1	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,
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PDM UNIVERSITY
M.SC (INFORMATION TECHNOLOGY)

DATA STRUCTURE LAB USING C++

L	T	P
4	0	0

MODULE CODE	COIT5111
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.

1. To teach the behaviour of basic data structure (list, stack, queue, hash table, trees, and graph).
2. To understand and analyse 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:

Following this course, students will be able to:

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

5. Student will be able to implement hash tables along with insert and retrieve operations.

MODULE CONTENT:

UNIT-I: C++ Class Overview Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling.
UNIT-II: C++ Advance Concepts Function Over Loading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.
UNIT-III: Overview of data structure Algorithms, performance analysis- time complexity and space complexity. Array: Introduction, Types and operations of arrays. Linked list: Introduction, Types and operations on linked list. Stacks: Operations and Applications, Queues: Operations, Types and Applications, memory representation of all.
UNIT-IV: Trees Introduction, Terminology, Representation, Binary Trees, Properties of Binary Tress, Binary Tree Representations, Binary Tree Traversal , Threaded Binary Trees, Heaps, Binary Search Trees, Searching a Binary Search Tree, operations on BST, AVL Trees, B-Trees, B-Tree of order m, height of a B-Tree, operations on B-Trees, m-way tree.
UNIT-V: Graphs Introduction, Definition, Graph Representation, Elementary Graph Operation, Depth First Search, Breadth First Search, memory representation, Spanning Trees, Minimum Cost Spanning Trees, Kruskal's Algorithm, Prim's Algorithm
UNIT-VI: Searching and sorting and file organisation Searching: Linear search, Binary Search. Sorting: insertion sort, Selection sort, Bubble sort, Quick Sort, Merge Sort, Quick sort, Radix sort, Tournament sort, Heap Sort. file Structures: introduction Sequential file, Indexed sequential files, Direct files, Hashing techniques, Hash function, Collision resolution, Linear probing, quadratic probing, Double hashing, Bucket addressing

RECOMMENDED BOOKS

TEXT BOOK	3. Theory & Problems of Data Structures by Jr. Symour Lipschetz, Schaum‟s outline by TMH 4. Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub. 5. Object-Oriented Programming in C++ by *Robert Lafore*

REFERENCE BOOK	3. Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition. 4. Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H

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

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EVALUATION

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

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
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PDM UNIVERSITY
M.SC (INFORMATION TECHNOLOGY)

DATA STRUCTURE USING C++ LAB

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

MODULE CODE	COAT5112
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 applications 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

5. Be able to design and analyse the time and space efficiency of the data structure.
6. Be capable to identity the appropriate data structure for given problem.
7. Have practical knowledge on the application of data structures.
8. Implement various sorting and searching techniques.

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M.SC (INFORMATION TECHNOLOGY)

LIST OF EXPERIMENTS

1.	Programs to demonstrate C++ classes.
2.	Programs to demonstrate inheritance in C++ classes
3.	Programs to demonstrate polymorphism in C++ classes.
4.	Programs to demonstrate inline, virtual and friend functions in C++.
5.	Programs to demonstrate templates in C++.
6.	Implementation of Array operations.
7.	Programs for Stack, Queues implementation using arrays.
8.	Program to convert an Infix Expression into Postfix and Postfix Evaluation
9.	Program to implement a Singly Linked List
10.	Programs to implement Stack & Queues using Linked Representation
11.	Programs to implement Insertion Sort, Selection Sort.
12.	Programs to implement quick Sort.
13.	Programs to implement merge sort.
14.	Programs to implement linear and binary search.
15.	Programs to implement Tree Traversals on Binary Trees
16.	Programs to implement BFS and BFS on graphs.

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).

PDM UNIVERSITY
M.SC (INFORMATION TECHNOLOGY)

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	1	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,
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PDM UNIVERSITY
M.SC (INFORMATION TECHNOLOGY)

PYTHON PROGRAMMING

L	T	P
4	0	0

MODULE CODE	COIT5113
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:

1. A study of the subject matter presented in this course will enable the students to become familiar with: To Understand data types (like character strings, integers, and real numbers)
2. To understand the Operations that can be applied to each data type.

LEARNING OUTCOMES:

1. To write programs that get input, perform calculations, and provide output (using Conditional logic, loops, Functions).
2. To write well designed and well documented programs that are easily maintainable.
3. To Test and debug programs (find out what is wrong and fix it)
4. To enjoy the art and science of computer programming.

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M.SC (INFORMATION TECHNOLOGY)

MODULE CONTENT:

UNIT-I: Basics Of Python Entering and Storing Data- Binding Values to Names- More Python Syntax Basics- Reading and Converting User Input. Making Decisions- Conditions in Python- Making Decisions: Simple if Statements.-Multiple Choice Decisions.
UNIT-II: Iteration And Lists Iteration: For and While Loops- Terminating the Current Iteration. — Sequence Containers: Lists and Tuples- Writing Lists and Tuples- Accessing Sequence Values- Manipulating Lists and Tuples.
UNIT-III: Sets And Dicts Sets and Dicts- Creating Sets- Working With Sets- Working with Dicts- Applying Dicts: Counting Words.
UNIT-IV: Formatting String Formatting- The format () Method- Function Arguments- Format Field Names- More About Looping-- Fun with the range () function- While Loops and User Input Validation.
UNIT-V: Files Reading and Writing Files- Creating a New File- Writing to a File- Reading Files as Text .
UNIT-VI: Python's Built-in Functions abs(x)- bool(x)- chr(i), The Python Standard Library- Namespaces- Python Modules.

RECOMMENDED BOOKS

TEXT BOOK	1. Introduction to Programming Using Python, First Edition by Y. Daniel Liang,©2013 Prentice Hall 2. Dawson, Michael. Python Programming for the Absolute Beginner (3rd ed.). Boston, MA: Course Technology, 2010.
REFERENCE BOOK	5. Shaw, Zed A., 2012. Learn Python the Hard Way, Second Edition, Shavian Publishing, LLC, 183 p

METHODS OF TEACHING AND STUDENT LEARNING

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

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ASSESSMENT METHODOLOGIES

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

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
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	2,4	3		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:

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M.SC (INFORMATION TECHNOLOGY)

PYTHON PROGRAMMING LAB

L	T	P
0	0	4

MODULE CODE	COIT5114
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 ‘Prolog’

4. To understand how various AI Language works.
5. To understand some important applications of Prolog.
6. To familiarize how certain applications can benefit with AI.

LEARNING OUTCOMES:

At the end of this lab session, the student will

1. Be able to write programs in Prolog.
2. Be capable to identity goal for given problem.
3. Have practical knowledge on the application of AI using prolog.
4. Implement various games.

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LIST OF EXPERIMENTS

1.	Write a program to compute distance between two points taking input from the user (Pythagorean Theorem).
2.	Write a Program for checking whether the given number is a even number or not.
3.	Write a program using a while loop that asks the user for a number, and prints a countdown from that number to zero.
4.	Using a for loop, write a program that prints out the decimal equivalents of 1/2, 1/3, 1/4, . . . , 1/10
5.	Program to generate a fibonnaci series and find its sum.
6.	Write a program to count the numbers of characters in the string and store them in a dictionary data structure.
7.	Write a program to count frequency of characters in a given file.
8.	Write a program to compute the number of characters, words and lines in a file.
9.	Write a function ball_collide that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding. Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius If (distance between two balls centers) <= (sum of their radii) then (they are colliding)
10.	Find mean, median, mode for the given set of numbers in a list.
11.	Write a function cumulative_product to compute cumulative product of a list of numbers.
12.	Write a program to perform addition and multiplication of two square matrices
13.	Write a script that imports requests and fetch content from the page. Eg. (Wiki).
14.	Write a GUI for an Expression Calculator using tk
15.	Write a program to implement some figures using turtle
16.	Write a test-case to check the function even_numbers which return True on passing a list of all even numbers.

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

METHODS OF TEACHING AND STUDENT LEARNING

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ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	1	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

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- Approved refinement decisions due for implementation,
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OPERATING SYSTEM

L	T	P
4	0	0

MODULE CODE	COIT5115
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:

Students will study advanced operating system topics and be exposed to recent developments in operating systems research.

1. Understand technical details of an operating system.
2. Gain some practical experience with systems programming and tools.
3. Gain experience with defining a deadlock.
4. Build, experiment with, and evaluate different OS.
5. Improve the accuracy and precision with operating system concepts and ideas.

LEARNING OUTCOMES

Following this course student will be able to:

1. Assess the concepts of advanced operating systems, features, types, concurrent process, synchronization, synchronization process, deadlock conditions & avoidance and resource allocations.
2. Understand the concepts of fault recovery and tolerance, classification, recovery, voting and dynamic protocols.
3. Asses the concepts of distributed operating systems,appreciate methods and tools used.
4. Understand the concepts of multiprocessor and database operating systems.

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MODULE CONTENT:

UNIT-I: Introduction Introduction, What is an Operating System, Simple Batch Systems, Multi-programmed 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, Segmentation with Paging Virtual Memory: Demand Paging, Page Replacement, Pagereplacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing.
UNIT-II: Process Processes: Process Concept, Process Scheduling, Operation on Processes, Cooperating Processes, Interprocess Communication CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Real-Time Scheduling, Algorithm Evaluation
UNIT-III: Semaphores Process Synchronization: Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors.
UNIT-IV: Deadlocks Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Combined Approach to Deadlock Handling. Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices.
UNIT-V: Distributed operating system Distributed operating system: Architecture, design issues, Lamport's logic clocks, vector clocks, causal ordering of messages, distributed mutual exclusion, token and non-token based algorithms.
UNIT-VI: Models Distributed file system Mechanism for building DFS, design issues of DFS, case studies, Protection and security, access matrix model, implementation of access matrix model using the capabilities, access control list, lock & key methods. Advance model Advance models: Take grant method, Bell La Padula method. Case studies. Laboratory experiments on internals of Linux, Windows

RECOMMENDED BOOKS

TEXT BOOK	6. Operating System Concepts by Abraham Silberschatz, Peter B. Galvin, G. Gagne, Sixth Addison n Wesley Publishing Co., 2003. 7. Advanced Concepts in Operating Systemsby Mukesh Singhal and N. G. Shivaratri McGraw- Hill, 2000 8. Distributed Operating System by Tanenbaum.

REFERENCE BOOK	6. Modern Operating Systems by Andrew S. Tanenbaum, Second Edition, Addison Wesley, 2001. 7. Wireless and Mobile Networks Architectureby Yi –Bing Lin &ImrichChlamatac, John Wiley & Sons, 2001.

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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
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	2,4	3		1,4		3

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EVALUATION

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SOFTWARE ENGINEERING

L	T	P
4	0	0

MODULE CODE	COIT5116
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 aspect of business model in software.
2. Software qualitative and quantitative analysis.

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

MODULE CONTENT:

Unit I: Software Engineering

The software crisis; principles of software engineering; programming in- the-small vs. programming-in-the-large. Pagereplacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing.

Unit II: Software process The software lifecycle; the waterfall model and variations; risk-driven approaches; introduction to evolutionary and prototyping approaches; agile process models; system classifications
Unit III: Project management Relationship to lifecycle; project planning; project control; project organization; risk management; cost models; configuration management; version control; quality assurance; metrics
Unit IV: Software requirements Requirements analysis; functional and non-functional requirements elicitation; analysis tools; requirements definition; requirements specification; static and dynamic specifications; requirements review.
UNIT-V : Software design Design for reuse; design for change; design notations; design evaluation and validation.
Unit VI: Implementation and Maintenance Programming standards and procedures; modularity; data abstraction; static analysis; unit testing; integration testing; regression testing; verification and validation; tools for testing; fault tolerance; The maintenance problem; the nature of maintenance; planning for maintenance.

RECOMMENDED BOOKS

TEXT BOOK	9. "Software Engineering: A Practitioner's Approach (6th ed.)"; R.S. Pressman; ; McGraw-Hill; 2006. 10. "Software Engineering (revised 2nd ed.)"; K.K. Aggarwal and Y. Singh; ; New Age International Publishers; 2006.
REFERENCE BOOK	8. . "An Integrated Approach to Software Engineering (3rd ed.)" P. Jalote; Narosa Publishing House; 2005. 9. 2. "Software Engineering (6th ed.)"; I. Sommerville; Pearson Education; 2004. 10. 3. "Software Engineering for Students (4th ed.)"; Douglas BellAddison-Wesley; 2005.

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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		4,5	2,4	5		1,4		3

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