CURRICULUM
MASTER OF COMPUTER APPLICATIONS
CHOICE BASED CREDIT SYSTEM

STUDENTS LEARNING OUTCOMES

The curriculum and syllabi for Master of Computer Applications (MCA) program (2017-18) conform to Outcome Based Education (OBE) for a flexible and structured Choice Based Credit System (CBCS). In general, **ELEVEN STUDENT OUTCOMES** (a-k) have been identified and the curriculum and syllabi have been chosen in such a way that each of the modules meets one or more of these outcomes. Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program. Further, each module in the program spells out clear instructional objectives which are mapped to the student outcomes.

Learning Outcomes are:

(a) Ability to apply knowledge of Mathematical Foundations in computing problems.
(b) Ability to understand the Software concepts and their applications.
(c) Ability to practice and develop software for interpretation and analysis of data.
(d) Ability to use the techniques, skills, and modern Software tools necessary for software Development.
(e) Ability to identify and analyze software problems in multiple aspects including coding, testing and implementation in industrial applications.
(f) Ability to develop operational software for enterprises satisfying economic, social and ethical constraints.
(g) Ability to apply Enterprise level application software for design of engineering product/process.
(h) Ability to function as consultant for the development of sustainable software solutions.
(i) An understanding of professional and ethical values.
(j) Ability to communicate effectively in diverse groups and exhibit leadership skills.
(k) To develop an understanding of global environment and its protection.

MASTER OF COMPUTER APPLICATIONS

SUMMARY OF PROGRAM CURRICULUM

Category	Total Number of Credits (MCA)	Percentage of Total credits
Program Core (PC)	98.5	63%
Program Elective (PE)	16.5	10%
Generic Elective (GE)	8	5%
Seminar & Special Problem (SP)	4	3%
PROJECT (PR)	30	19%
	157	**100%**

PROGRAM SCHEME

SEMESTER - I

MODULE CODE	SUB-CATEGORY	MODULE	L	T	P	C
	PC	PROBLEM SOLVING AND PROGRAMMING	4	0	0	4
	PC	PC- SOFTWARE AND WEB TECHNOLOGIES	4	0	0	4
	PC	MATHEMATICAL FOUNDATION OF COMPUTER APPLICATIONS	3	1	0	3.5
	PC	COMPUTER ORGANIZATION AND ARCHITECTURE	4	0	0	4
	PC	STRUCTURED SYSTEM ANALYSIS AND DESIGN	3	1	0	3.5
	PC	EXERCISES FOR LEARNING BASIC PRINCIPLES OF STRU	0	0	4	2
	PC	EXERCISE IN HTML AND DHTML	0	0	4	2
	PC	ASSEMBLY LAB	0	0	4	2
	SP	SPECIAL PROBLEM	0	0	2	1
TOTAL CREDITS			**18**	**2**	**14**	**26**

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

SEMESTER - II

MODULE CODE	CATEGORY	MODULE	L	T	P	C
	PC	DATA STRUCTURES	4	0	0	4
	PC	DATA BASE MANAGEMENT SYSTEM	4	0	0	4
	PC	OPERATING SYSTEM	3	1	0	3.5
	PC	OBJECT ORIENTED PROGRAMMING	4	0	0	4
	PC	ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM	3	1	0	3.5
	PC	EXERCISES TO IMPLEMENT VARIOUS DATA STRUCTURE	0	0	4	2
	PC	EXERCISES /CASE STUDIES THAT REQUIRE TABLE DESI	0	0	4	2
	PC	OBJECT ORIENTED PROGRAMMING USING C++	0	0	4	2
	SP	SEMINAR	0	0	2	1
TOTAL CREDITS			**18**	**2**	**12**	**26**

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

SEMESTER - III

MODULE CODE	CATEGORY	MODULE	L	T	P	C
	PC	COMPUTER GRAPHICS	4	0	0	4
	PC	INTERNET AND JAVA PROGRAMMING	4	0	0	4
	PC	SYSTEM PROGRAMMING	4	0	0	4
	PC	SOFTWARE ENGINEERING	3	1	0	3.5
	PE	ELECTIVE-I	3	1	0	3.5
	PC	EXERCISE IN COMPUTER GRAPHICS USING C	0	0	4	2
	PC	PROGRAMMING IN JAVA	0	0	4	2
	PC	EXERCISE TO LEARN VARIOUS COMMANDS IN UNIX &	0	0	4	2
	SP	SEMINAR	0	0	2	1
TOTAL CREDITS			**14**	**2**	**12**	**26**

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

ELECTIVES

PROGRAM ELECTIVE I
1. COMPUTER NETWORK
2. ADVANCED SYSTEM ADMINISTRATION
3. SOFT COMPUTING

SEMESTER - IV

MODULE CODE	CATEGORY	MODULE	L	T	P	C
	PC	ASP.NET USING C#	4	0	0	4
	PC	ADVANCE JAVA	4	0	0	4
	PC	SOFTWARE TESTING AND QUALITY ANALYSIS	3	1	0	3.5
	PE	ELECTIVE-II	3	1	0	3.5
	GE	ELECTIVE-A	4	0	0	4
	PC	BUILDING SMALL APPLICATION USING DOT NET	0	0	4	2
	PC	LEARNING PROGRAMMING IN ADVANCE JAVA	0	0	4	2
	PC	DEVELOPING APPLICATIONS USING PHP	0	0	4	2
	SP	SEMINAR	0	0	2	1
TOTAL CREDITS			**0**	**0**	**2**	**26**

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

ELECTIVES

PROGRAM ELECTIVE II
1. OBJECT ORIENTED ANALYSIS AND DESIGN
2. MULTIMEDIA TECHNOLOGIES
3. SATELLITE AND MOBILE COMMUNICATION
4. CLOUD COMPUTING

GENERIC ELECTIVE - A
1. SAP (ABAP/MM/SD/FI/HR)$^{\Psi}$
2. CCNA $^{\Psi}$
3. STATISTICAL TOOLS

ψAdditional fee, if any, shall be borne by the student.

SEMESTER - V

MODULE CODE	CATEGORY	MODULE	L	T	P	C
	PC	ADVANCED DBMS	4	0	0	4
	PC	SOFTWARE PROJECT MANAGEMENT	3	1	0	3.5
	PE	ELECTIVE-III	3	1	0	3.5
	PE	ELECTIVE-IV	4	0	0	4
	GE	ELECTIVE-B	4	0	0	4
	PC	ADBMS LAB	0	0	4	2
	PE	ELECTIVE-IV LAB	0	0	4	2
	PR	MINOR PROJECT (RESEARCH ORIENTED)	0	0	8	4
TOTAL CREDITS			**18**	**2**	**16**	**27**

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

ELECTIVES

PROGRAM ELECTIVE III
1. COMPUTER BASED MANAGEMENT SYSTEM
2. E-COMMERCE & I.T.MANAGEMENT

PROGRAM ELECTIVE IV
1. VISUAL BASIC .NET
2.WINDOWS PROGRAMMING
3. PYTHON PROGRAMMING

GENERIC ELECTIVE - B
1. SAP (ABAP/MM/SD/FI/HR)$^{\Psi}$
2. CCNA $^{\Psi}$
3. NUMERICAL METHODS

ψAdditional fee, if any, shall be borne by the student.

SEMESTER - VI

MODULE CODE	CATEGORY	MODULE	L	T	P	C
	PR	INDUSTRIAL TRAINING	-	-	-	26
TOTAL CREDITS			**0**	**0**	**0**	**26**

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

PDM UNIVERSITY
MASTER OF COMPUTER APPLICATIONS

PROGRAM SCHEME

SEMESTER - I

MODULE CODE	CATEGORY	MODULE	L	T	P	C
	PC	PROBLEM SOLVING AND PROGRAMMING	4	0	0	4
	PC	PC- SOFTWARE AND WEB TECHNOLOGIES	4	0	0	4
	PC	MATHEMATICAL FOUNDATION OF COMPUTER APPLICATIONS	3	1	0	3.5
	PC	COMPUTER ORGANIZATION AND ARCHITECTURE	4	0	0	4
	PC	STRUCTURED SYSTEM ANALYSIS AND DESIGN	3	1	0	3.5
	PC	EXERCISES FOR LEARNING BASIC PRINCIPLES OF STRUCTURED PROGRAMMING WITH C	0	0	4	2
	PC	EXERCISE IN HTML AND DHTML	0	0	4	2
	PC	ASSEMBLY LAB	0	0	4	2
	SP	SPECIAL PROBLEM	0	0	2	1
TOTAL CREDITS			**18**	**2**	**14**	**26**

Abbreviations:

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

PC Program Core
SP Special Problem

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PROBLEM SOLVING AND 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:

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	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
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
MASTER OF COMPUTER APPLICATIONS

PC SOFTWARE AND WEB TECHNOLOGIES

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:

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.

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	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	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;
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PDM UNIVERSITY
MASTER OF COMPUTER APPLICATIONS

MATHEMATICAL FOUNDATION OF COMPUTER APPLICATION

L	T	P
3	1	0

MODULE CODE	
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.

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	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
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:

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- Actions taken based on previous course review; and
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COMPUTER ORGANIZATION AND ARCHITECTURE

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

PDM UNIVERSITY
MASTER OF COMPUTER APPLICATIONS

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:

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

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: **Unit 6: 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	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
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:

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

STRUCTURED SYSTEM ANALYSIS AND DESIGN

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

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

PDM UNIVERSITY
MASTER OF COMPUTER APPLICATIONS

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.

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	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

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.

EXERCISES FOR LEARNING BASIC PRINCIPLES OF STRUCTURED PROGRAMMING WITH C

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

MODULE CODE	
CREDIT POINTS	2
FORMATIVE ASSESSMENT MARKS	30
SUMMATIVE ASSESSMENT MARKS	30

PDM UNIVERSITY
MASTER OF COMPUTER APPLICATIONS

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.

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.

EXERCISE IN HTML AND DHTML

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0	0	4

MODULE CODE	

PDM UNIVERSITY
MASTER OF COMPUTER APPLICATIONS

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.

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.

ASSEMBLY LAB **L T P**
0 0 4

MODULE CODE	

PDM UNIVERSITY
MASTER OF COMPUTER APPLICATIONS

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.

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

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ASSESSMENT METHODOLOGIES:

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

Practical:

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

MAPPING OF COURSE LEARNING OUTCOMES

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

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