KONGU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)

ERODE – 638 107

B.Sc (Information Technology)

KONGU ARTS AND SCIENCE COLLEGE

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2017-2018

KONGU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

ERODE - 638 107

DEPARTMENT OF COMPUTER TECHNOLOGY AND INFORMATION TECHNOLOGY

B.Sc. (INFORMATION TECHNOLOGY)

(For the candidates admitted during the Academic Year 2015 - 2016 and onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

SEMESTER - I

Part	Course Code	Course	Hrs/Week	Credits	T/P	Exam Duration	CIA	ESE	Total Marks
I	15T01/15H01/ 15F01/15M01/ 15S01	Language - I	6	4	T	3 Hrs	25	75	100
II	15E01	English - I	6	4	T	3 Hrs	25	75	100
III	15UAMCT101	Core 1: Computing Fundamentals and C Programming	4	4	T	3 Hrs	25	75	100
III	15UAMCT102	Core 2: Digital Principles	4	4	T	3 Hrs	25	75	100
III	15UAMCP103	Core Lab 1: C Programming Lab	3	3	P	3 Hrs	40	60	100
III	15UAMAT104	Allied 1: Mathematical Structures	5	4	T	3 Hrs	25	75	100
IV	15ES01	Foundation Course: Environmental Studies	2	2	T	3 Hrs	-	50	50

SEMESTER - II

Part	Course Code	Course	Hrs/Week	Credits	T/P	Exam Duration	CIA	ESE	Total Marks
I	15T02/15H02/ 15F02/15M02/ 15S02	Language - II	6	4	T	3 Hrs	25	75	100
II	15E02	English - II	6	4	T	3 Hrs	25	75	100
III	15UAMCT201	Core 3: Object Oriented Programming with C++	4	4	T	3 Hrs	25	75	100
III	15UAMCT202	Core 4: Data Structures	4	4	T	3 Hrs	25	75	100
III	15UAMCP203	Core Lab 2: C++ Programming Lab	3	3	P	3 Hrs	40	60	100
III	15UAMAT204	Allied 2: Discrete Structures	5	4	T	3 Hrs	25	75	100
IV	15VE01	Value Education: Human Rights	2	2	T	3 Hrs	-	50	50

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SEMESTER - III

Part	Course Code	Course	Hrs/Week	Credits	T/P	Exam Duration	CIA	ESE	Total Marks
III	15UAMCT301	Core 5: Java Programming	6	4	T	3 Hrs	25	75	100
III	15UAMCT302	Core 6: Database Management Systems	6	4	T	3 Hrs	20	55	75
III	15UAMCP303	Core Lab 3: Java Programming Lab	6	4	P	3 Hrs	40	60	100
III	15UAMAT304	Allied 3: Microprocessor and ALP	6	4	T	3 Hrs	25	75	100
IV	15UAMSP305	Skill Based Course 1(Lab): Database Management Systems Lab	4	3	P	3 Hrs	30	45	75
IV	15BT01 / 15AT01 / 15NM01	Basic Tamil - I * / Advanced Tamil - I # / Non Major Elective - I (Yoga for Human Excellence) #	2	2	T	3 Hrs	50		50

SEMESTER - IV

Part	Course Code	Course	Hrs/Week	Credits	T/P	Exam Duration	CIA	ESE	Total Marks
III	15UAMCT401	Core 7: Web Technology	6	5	T	3 Hrs	25	75	100
III	15UAMCT402	Core 8: Computer Networks	6	4	T	3 Hrs	20	55	75
III	15UAMCP403	Core Lab 4: Web Technology Lab	6	4	P	3 Hrs	40	60	100
III	15UAMAT404	Allied 4: Embedded Systems	6	4	T	3 Hrs	25	75	100
IV	15UAMSP405	Skill Based Course 2 (Lab): Networks Lab	4	3	P	3 Hrs	30	45	75
IV	15BT02 / 15AT02 / 15NM02	Basic Tamil - II * / Advanced Tamil - II # / Non Major Elective - II (General Awareness) #	2	2	T	3 Hrs	50		50

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SEMESTER - V

Part	Course Code	Course	Hrs/Week	Credits	T/P	Exam Duration	CIA	ESE	Total Marks
III	15UAMCT501	Core 9: Visual Basic .NET Programming	6	4	T	3 Hrs	25	75	100
III	15UAMCT502	Core 10: Operating Systems	6	4	T	3 Hrs	25	75	100
III	15UAMCT503	Core 11: Client/Server Computing	5	4	T	3 Hrs	25	75	100
III	15UAMCP504	Core Lab 5: VB .NET Programming Lab	5	4	P	3 Hrs	40	60	100
III	15UAMET505/ 15UAMET506/ 15UAMET507	Elective - I	5	4	T	3 Hrs	25	75	100
IV	15UAMSP508	Skill Based Course 3 (Lab): Multimedia Lab	3	3	P	3 Hrs	30	45	75

SEMESTER - VI

Part	Course Code	Course	Hrs/Week	Credits	T/P	Exam Duration	CIA	ESE	Total Marks
III	15UAMCT601	Core 12: Open Source Programming	6	4	T	3 Hrs	25	75	100
III	15UAMCP602	Core Lab 6: Open Source Programming Lab	5	4	P	3 Hrs	40	60	100
III	15UAMET603/ 15UAMET604/ 15UAMET605	Elective - II	6	4	T	3 Hrs	25	75	100
III	15UAMET606/ 15UAMET607/ 15UAMET608	Elective - III	6	4	T	3 Hrs	25	75	100
III	15UAMCV609	Project Work	4	4	P	3 Hrs	25	75	100
IV	15UAMSP610	Skill Based Course 4 (Lab): CASE Tools and Software Testing Lab	3	3	P	3 Hrs	30	45	75
V	15NS01/ 15NC01/ 15PE01/ 15YR01	Extension Activities	-	1	-	-	50	-	50

Total Marks: 3500

Total Credits: 140

* CIA only

ESE only

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LIST OF ELECTIVE COURSES

Elective - I	15UAMET505	A	Multimedia Systems
	15UAMET506	B	TCP / IP
	15UAMET507	C	Component Based Technology
Elective - II	15UAMET603	A	Enterprise Resource Planning
	15UAMET604	B	Software Engineering
	15UAMET605	C	Mobile Computing
Elective - III	15UAMET606	A	Artificial Intelligence
	15UAMET607	B	Cyber Law
	15UAMET608	C	Data Mining

LIST OF ALLIED COURSES

Allied 1	15UAMAT104	Mathematical Structures
Allied 2	15UAMAT204	Discrete Structures
Allied 3	15UAMAT304	Microprocessor and ALP
Allied 4	15UAMAT404	Embedded Systems

LIST OF SKILL BASED COURSES

Skill Based Course 1	15UAMSP305	Database Management Systems Lab
Skill Based Course 2	15UAMSP405	Networks Lab
Skill Based Course 3	15UAMSP508	Multimedia Lab
Skill Based Course 4	15UAMSP610	CASE Tools and Software Testing Lab

LIST OF ADVANCED LEARNERS COURSES

Advanced Learners Course 1	15UAMAL406	A	PC Hardware
	15UAMAL407	B	Information Security
Advanced Learners Course 2	15UAMAL509	A	Python Programming
	15UAMAL510	B	Cloud Computing

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SCHEME OF EXAMINATION - CBCS PATTERN
(For the candidates admitted during the academic year 2017 - 2018 and onwards)

Part	Course Code	Course Title	Inst. Hrs /Week	T/P	Examination Details				Credits
					Duration in Hours	CIA	ESE	Total Marks	
SEMESTER I									
I	17T01/17H01/ 17F01/17M01/ 17S01	Language - I	6	T	3	25	75	100	4
II	17E01	English - I	6	T	3	25	75	100	4
III	17UAMCT101	Core 1: Digital Principles	4	T	3	25	75	100	4
III	17UAMCT102	Core 2: C Programming	4	T	3	25	75	100	4
III	17UAMCP103	Core Lab 1: C Programming Lab	3	P	3	40	60	100	3
III	17UAMAT104	Allied 1: Numerical and Statistical Methods	5	T	3	25	75	100	4
IV	17ES01	Foundation Course I: Environmental Studies	2	T	3	-	50	50	2
		Total	**30**	-	-	-	-	**650**	**25**
SEMESTER II									
I	17T02/17H02/ 17F02/17M02/ 17S02	Language - II	6	T	3	25	75	100	4
II	17E02	English - II	6	T	3	25	75	100	4
III	17UAMCT201	Core 3: Data Structures	4	T	3	25	75	100	4
III	17UAMCT202	Core 4: Object Oriented Programming with C++	4	T	3	25	75	100	4
III	17UAMCP203	Core Lab 2: C++ Programming Lab	3	P	3	40	60	100	3
III	17UAMAT204	Allied 2: Discrete Mathematics	5	T	3	25	75	100	4
IV	17VE01	Foundation Course II: Value Education	2	T	3	-	50	50	2
		Total	30	-				650	25

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Part	Course Code	Course Title	Inst. Hrs /Week	T/P	Examination Details				Credits
					Duration in Hours	CIA	ESE	Total Marks	
SEMESTER III									
III	17UAMCT301	Core 5: Database Systems	6	T	3	25	75	100	4
III	17UAMCT302	Core 6: Java Programming	6	T	3	25	75	100	4
III	17UAMCP303	Core Lab 3: Java Programming Lab	6	P	3	40	60	100	4
III	17UAMAT304	Allied 3: Microprocessor and ALP	6	T	3	25	75	100	4
IV	17UAMSP305	Skill Based Course 1(Lab): Database Systems Lab	4	P	3	30	45	75	3
IV	17BT01/ 17AT01/ 17UAMNT306	Basic Tamil - I * / Advanced Tamil - I # / Non Major Elective - I # (Introduction to Information Technology @)	2	T	3	75		75	2
		Total	**30**	-	-	-	-	**550**	**21**
SEMESTER IV									
III	17UAMCT401	Core 7: Operating Systems	6	T	3	25	75	100	4
III	17UAMCT402	Core 8: Web Technology	6	T	3	25	75	100	4
III	17UAMCP403	Core Lab 4: Web Technology Lab	6	P	3	40	60	100	4
III	17UAMAT404	Allied 4: Embedded Systems	6	T	3	25	75	100	4
IV	17UAMSP405	Skill Based Course 2 (Lab): Multimedia Lab	4	P	3	30	45	75	3
IV	17BT02/ 17AT02 / 17UAMNT406	Basic Tamil - II * / Advanced Tamil - II # / Non Major Elective - II # (E-Commerce @)	2	T	3	75		75	2
		Total	**30**	-	-	-	-	**550**	**21**

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Part	Course Code	Course Title	Inst. Hrs /Week	T/P	Examination Details				Credits
					Duration in Hours	CIA	ESE	Total Marks	
SEMESTER V									
III	17UAMCT501	Core 9: Data Communications and Networks	6	T	3	25	75	100	4
III	17UAMCT502	Core 10: Software Engineering	5	T	3	25	75	100	4
III	17UAMCT503	Core 11: Visual Basic .NET Programming	6	T	3	25	75	100	4
III	17UAMCP504	Core Lab 5: VB .NET Programming Lab	5	P	3	40	60	100	4
III	17UAMET505/ 17UAMET506/ 17UAMET507	Elective - I	5	T	3	25	75	100	4
IV	17UAMSP508	Skill Based Course 3 (Lab): PHP Programming Lab	3	P	3	30	45	75	3
		Total	**30**	-	-	-	-	**575**	**23**
SEMESTER VI									
III	17UAMCT601	Core 12: Information Security	6	T	3	25	75	100	5
III	17UAMCP602	Core Lab 6: Information Security Lab	5	P	3	40	60	100	4
III	17UAMET603/ 17UAMET604/ 17UAMET605	Elective - II	6	T	3	25	75	100	4
III	17UAMET606/ 17UAMET607/ 17UAMET608	Elective - III	6	T	3	25	75	100	4
III	17UAMCV609	Project Work	4	P	3	20	80	100	4
IV	17UAMSP610	Skill Based Course 4 (Lab): Software Engineering and CASE Tools Lab	3	P	3	30	45	75	3
V	17NS01/ 17NC01/ 17PE01/ 17YR01	Extension Activities	-	-	-	50	-	50	1
		Total	**30**	-	-	-	-	**625**	**25**
		TOTAL	-	-	-	-	-	**3600**	**140**

CIA - CONTINUOUS INTERNAL ASSESSMENT
ESE - END SEMESTER EXAMINATION
* CIA ONLY
# ESE ONLY
@ OFFERED TO OTHER DEPARTMENT STUDENTS

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LIST OF ALLIED COURSES			
Allied 1	17UAMAT104	Numerical and Statistical Methods	
Allied 2	17UAMAT204	Discrete Mathematics	
Allied 3	17UAMAT304	Microprocessor and ALP	
Allied 4	17UAMAT404	Embedded Systems	
LIST OF SKILL BASED COURSES			
Skill Based Course 1	17UAMSP305	Database Systems Lab	
Skill Based Course 2	17UAMSP405	Multimedia Lab	
Skill Based Course 3	17UAMSP508	PHP Programming Lab	
Skill Based Course 4	17UAMSP610	Software Engineering and CASE Tools Lab	
LIST OF ADVANCED LEARNERS COURSES			
Advanced Learners Course 1	17UAMAL407	A	Linux Programming
	17UAMAL408	B	PC Hardware
Advanced Learners Course 2	17UAMAL509	A	J2EE
	17UAMAL510	B	Middleware Technology
LIST OF ELECTIVE COURSES			
Elective - I	17UAMET505	A	Programming in PHP
	17UAMET506	B	Python Programming
	17UAMET507	C	Programming in C#
Elective - II	17UAMET603	A	Artificial Intelligence
	17UAMET604	B	Data Mining
	17UAMET605	C	Cloud Computing
Elective - III	17UAMET606	A	Mobile Computing
	17UAMET607	B	Big Data Analytics
	17UAMET608	C	Internet of Things

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Sem	Course Code	Core 2: C Programming	Total Marks: 100		Hours Per Week	Credits
I	17UAMCT102		CIA: 25	ESE: 75	4	4

OBJECTIVE:

To enable the students to learn about algorithms and programs and solve problems through logical thinking.

UNIT - I

Overview of C: History of C - Importance of C - Basic Structure of C Programs - Programming Style - Executing a C Program - **Constants, Variables and Data Types:** Character Set - C Tokens - Keywords and Identifiers - Constants - Variables - Data Types - Declaration of Variables - Declaration of Storage Class - Assigning Values to Variables - Defining Symbolic Constants - Declaring a Variable as Constant - Declaring a Variable as Volatile - Operators and Expressions.

UNIT - II

Decision Making and Branching: Decision Making with If statement - Simple If Statement - The If...Else Statement - Nesting of If..Else Statements - The Else If Ladder - The Switch Statement - The ?: Operator -The Goto Statement - **Decision Making and Looping:** The While Statement - The do Statement - The for Statement - Jumps in Loops.

UNIT - III

Arrays: One-Dimensional Arrays - Declaration of One-Dimensional Arrays - Initialization of One-Dimensional Arrays - Two-Dimensional Arrays - Initializing Two-Dimensional Arrays - Multi-Dimensional Arrays - Dynamic Arrays - **Character Arrays and Strings:** Declaring and Initializing String Variables - Reading Strings from Terminal - Writing Strings to Screen - Arithmetic Operations on Characters - Putting Strings Together - Comparison of Two Strings - String-Handling Functions - Table of Strings.

UNIT - IV

User Defined Functions: Definition of Functions - Return Values and Their Types - Function Calls - Function Declaration - Category of Functions - No Arguments and No Return Values - Arguments but No Return Values - No Arguments but Returns a Value - Functions that Returns Multiple Values - Nesting of Functions - Recursion - The Scope, Visibility and Lifetime of Variables - **Structures and Unions:** Introduction - Defining a Structure -

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Declaring Structure Variables - Accessing Structure Members - Structure Initialization - Arrays of Structures Arrays within Structures - Structures within Structures - Structures and Functions - Unions.

UNIT - V

Pointers: Introduction - Understanding Pointers - Accessing the Address of a Variable - Declaring Pointer Variables - Initialization of Pointer Variables - Accessing a Variable through its Pointer - Chain of Pointers - Pointer Expressions - Pointers and Arrays - Pointers and Character Strings - Array of Pointers - Pointer as Function Arguments - Functions Returning Pointers - Pointers to Functions - Pointers and Structures - **File Management in C:** Defining and Opening a File - Closing a File - Input/Output Operations on Files - Error Handling During I/O Operations - Random Access to Files - Command Line Arguments - The Preprocessor.

TEXTBOOK:

E.Balagurusamy, Programming in ANSI, Sixth Edition Tata McGraw Hill Education, Third Reprint 2012.

BOOKS FOR REFERENCE:

1. Pradip Dey, Manas Ghosh, Fundamentals of Computers with Programming in C, 1st Edition, Oxford Higher Education, 2007.
2. Ashok N. Kamthane, Programming with ANSI and Turbo, 1st Edition, Pearson Education, New Delhi, 2004.
3. Yeswanth Kanetkar, Let Us C, 8th Edition, BPB Publications, New Delhi, 2007.
4. Basavaraj.S, Amami, Shanmukhappa A.Angadi & Sunilkumar S.Manvi, Computer Concepts and C Programming, 2nd Edition, PHI, 2010.
5. Herbert Schildt, The Complete Reference C, 4th Edition, Tata McGraw-Hill, 2008.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Core 3: Data Structures	Total Marks: 100		Hours Per Week	Credits
II	17UAMCT201		CIA: 25	ESE: 75	4	4

OBJECTIVE:

To enable the students to learn the basic techniques of algorithm analysis and programming skills.

UNIT - I

Introduction: Overview - Pointers and Dynamic Memory Allocation - Algorithm Specification - Data Abstraction - Performance Analysis - Performance Measurement - **Arrays and Structures:** Arrays - Dynamically Allocated Arrays - Structures and Unions - Polynomials - Sparse Matrices Using Arrays - Representation of Multidimensional Arrays.

UNIT - II

Stacks and Queues: Stacks - Stacks Using Dynamic Arrays - Queues - Circular Queues Using Arrays - A Mazing Problem - Evaluation of Expressions - Multiple Stacks and Queues.

UNIT - III

Linked Lists: Singly Linked Lists - Linked Stacks and Queues - Polynomials - Additional List Operations - Sparse Matrices Using Linked List - Doubly Linked Lists.

UNIT - IV

Trees: Introduction - Binary Trees - Binary Tree Traversals - **Graphs:** The Graph Abstract Data Type - Elementary Graph Operations - Minimum Cost Spanning Trees - Kruskal's Algorithm - Shortest Paths and Transitive Closure.

UNIT - V

Searching: Introduction - Binary Search - Indexed Sequential Search - **Sorting:** Insertion Sort - Quick Sort - How to sort fast - Merge Sort - Heap Sort - Sorting on Several Keys - List and Table Sorts - External Sorting.

TEXTBOOKS:

1. Horowitz Sahni Anderson-Freed, Fundamental of Data Structures in C, Universities Press (India) Private Limited, 2008 (Unit I, II, III, IV & V - Sorting).
2. ISRD, Data Structures Using C, Tata McGraw-Hill Publishing Company Limited, 2007 (Unit V - Searching).

BOOKS FOR REFERENCE:

1. Data Structures through C. Yashwant Kanetkar. 2nd Edition. BPB Publication. 2009.
2. An Introduction to Data Structures with Applications. Tremblay J.P and Sorenson P.G. 2nd Edition. Tata McGraw Hill Education Private Ltd. 2002.
3. Data Structures using C. Aaron M.Tanenbaum. Yedidyah Langsam. Moshe J.Augenstein. 6th Edition, Pearson Education, 2008.
4. Introduction to Data Structures in C, Ashok N Kamthane, 2nd Edition, Pearson Education 2008.
5. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, 2nd Edition. Pearson Education. 1997.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Allied 1: Numerical and Statistical Methods	Total Marks: 100		Hours Per Week	Credits
I	17UAMAT104		CIA: 25	ESE: 75	5	4

OBJECTIVE:

To enable the students to understand the concepts of numerical and statistical methods for Computer Science.

(No Derivations, only problems)

UNIT - I

The Solution of Numerical Algebraic and Transcendental Equations: The Bisection Method - Regula Falsi Method - Newton-Raphson Method - Solution of Simultaneous Linear Algebraic Equations: Gauss-Elimination Method and Gauss-Seidel Method of Iteration.

UNIT - II

Interpolation: Newton's Forward and Backward interpolation formulae - Numerical Differentiation: Newton's Forward Difference - Newton's Backward Difference - Numerical Integration: The Trapezoidal Rule - Simpson's one-third Rule.

UNIT - III

Measures of Central Tendency: Mean, Median and Mode - Relationship among Mean, Median and Mode - Measures of Dispersion: Range, Quartile Deviation and Standard Deviation - Coefficient of Variation.

UNIT - IV

Correlation: Simple Correlation - Scatter Diagram - Karl Pearson's Coefficients of Correlation - Spearman's Rank Correlation Coefficient.

UNIT - V

Regression: Regression Lines - Regression in two variables - Simple problems - Difference between Correlation and Regression.

TEXTBOOKS:

1. Dr. P.Kandasamy, Dr. K. Thilagavathy and Dr. K.Gunavathi, "Numerical Methods", S.Chand, 2016.

UNIT I : Chapter 3 : Sections 3.1, 3.3, 3.4
Chapter 4 : Sections 4.2, 4.9

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UNIT - II : Chapter 6 : Sections 6.2, 6.3

Chapter 9 : Sections 9.2, 9.3, 9.9, 9.11, 9.13, 9.16

2. S.P. Gupta, "Statistical Methods", Sultan Chand & Sons, 2012.

UNIT - III : Chapter 7 : Pages 181, 183, 184, 197-200, 212-216, 221,222

Chapter 8 : Pages 278-280, 287-293, 298

UNIT - IV : Chapter 10: Pages 395-401, 418-423

UNIT - V : Chapter 11: Pages 454, 459, 464-467

BOOKS FOR REFERENCE:

1. E. Balagurusamy, " Numerical methods", Tata MC Graw Hill Publishing Company Ltd. 2008.
2. S.C. Gupta, V.K.Kapoor, "Fundamental of Mathematical statistics", Sultan Chand and Sons, 2008.
3. Richard W.Hamming, "Numerical Methods for Scientists and Engineers", Dover Publications Inc., 1987.
4. R.S.N. Pillai & Bagavathi, "Statistics", Sultan Chand &Co, 2010.
5. PA. Navnitham, "Business Mathematics & Statistics", Jai Publishers, 2011.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Allied 2: Discrete Mathematics	Total Marks: 100		Hours Per Week	Credits
II	17UAMAT204		CIA: 25	ESE: 75	5	4

OBJECTIVE:

To enable the students to understand the concepts of Discrete Structures, relations, functions, lattices and Boolean algebra.

UNIT - I

Connectives: Negation - Conjunction - Disjunction - Statement Formulas and Truth Tables - Conditional and Biconditional - Well-formed Formulas - Tautologies - Equivalence of formulas - Duality law - Tautological implications.

UNIT - II

Normal Forms: Disjunctive Normal Form - Conjunctive Normal Form - Principle Disjunctive Normal Form - Principle Conjunctive Normal Form - Predicate Calculus: Predicates - The Statement Function, Variables and Quantifiers - Predicate Formulas - Free and Bound Variables - Inference Theory of the Predicate Calculus: Theory of Inference for the Predicate Calculus.

UNIT - III

Relations and Ordering: Relations - Properties of Binary Relations in a Set - Relations Matrix and Graph of a Relation - Equivalence Relation - Composition of Binary Relations - Partial Ordering - Partially Ordered Set: Representation and Associated Terminology.

UNIT - IV

Functions: Definition and Introduction - Composition of functions - Inverse functions - Grammar and Languages: Discussion of Grammars - Formal Definition of a Language.

UNIT - V

Lattices: Definition and Examples - Some Properties of Lattices - Some Special Lattices. Boolean Algebra: Definition and Examples - Boolean Functions.

TEXTBOOK:

J. P. Tremblay and R. Manohar, "Discrete Mathematics Structures with Applications to computer science", 32nd Reprint, Mc Graw Hill International, 2008.

UNIT - I : Chapter 1 : Sections 1.2.1-1.2.4, 1.2.6-1.2.11

UNIT - II : Chapter 1 : Sections 1.3.1-1.3.4, 1.5.1-1.5.4, 1.6.4

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UNIT - III : Chapter 2 : Sections 2.3.1-2.3.3, 2.3.5, 2.3.7-2.3.9

UNIT - IV : Chapter 2 : Sections 2.4.1-2.4.3

Chapter 3 : Sections 3.3.1-3.3.2

UNIT - V : Chapter 4 : Sections 4.1.1,4.1.2, 4.1.5, 4.2.1, 4.3.1,4.3.2

BOOKS FOR REFERENCE:

1. J.K.Sharma, "Discrete Mathematics", Second Edition, Macmillan India Ltd, 2005.
2. J. P. Tremblay and R. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", 32nd Reprint, Tata McGraw-Hill Publishing Company Limited, 2008.
3. Dr. A.Singaravelu, Dr. M.P.Jeyaraman, "Discrete Mathematics", Meenakshi Agencies, 2012.
4. K. Balakrishnan, "Introductory Discrete Mathematics", Dover Publications Incs, October, 2010.
5. A.Solairaju, M.Chadrasekhar, S.Ganesh and R.Krishnamoorthy, "Discrete Mathematics Structures", Anuradha Agencies, 2001.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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SEMESTER - V

Course: Core 9: Visual Basic .NET Programming | **Hours per week: 6**

Course Code: 15UAMCT501 | **Credit: 4**

Objective:

To enable the students to learn the .NET Technology.

UNIT - I

Visual Studio .NET: Key Components of the .NET Framework - Application Execution in the .NET Framework - Exploring Visual Studio .NET: Visual Basic .NET Advantages - Applications Commonly Developed in Visual Studio .NET - Visual Studio .NET IDE: Visual Studio Interface - Customizing Development Environment.

UNIT - II

Windows Forms: Introduction to Visual Basic .NET - Creating Windows Forms - Working with Controls - Windows Forms - Variables - Controlling Program Flow - Procedures in Visual Basic .NET.

UNIT - III

Implementing VB .NET Classes - Handling Errors in Visual Basic .NET - Accessing a Database.

UNIT - IV

Web Forms: Introducing ASP .NET - ASP .NET Applications - ASP .NET Web Forms Server Controls - Working with Validation Controls - Developing ASP .NET Server Controls.

UNIT - V

Rich Web Controls - Data Binding with Server Controls - Working with Web Server Control Templates - ADO .NET with ASP .NET.

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Textbook:

Mridula Parihar, Yesh Singhal, Nitin Pandey, Visual Studio .NET Programming, Wiley dreamtech india Pvt.Ltd, First Edition, 2002, Reprint 2007.

Books for Reference:

1. Jeffrey R.Shapiro, Visual Basic .NET: The Complete Reference, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2002, Eleventh Reprint 2007.
2. Steven Holzner, Visual Basic .NET Programming, Black Book, Dreamtech Press, Reprint Edition, 2008.
3. Deitel & Deitel, Nieto, Visual Basic .NET How to Program,Pearson Education, Second Edition, Second Indian Reprint 2005.
4. Bill Evjen, Jason Beres, et al., Visual Basic .NET Programming Bible, Wiley India(P) Ltd, New Delhi, 2006.
5. C.Muthu, Visual Basic .NET, Tata Mcgraw Hill, Vijay Nicole Imprints Private Limited, First Reprint 2008.

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SEMESTER - V

Course : Core 10 : Operating Systems

Course Code: 15UAMCT502

Hours per week: 6

Credit: 4

Objective:

To enable the students to learn about Structure and Functions of Operating System.

UNIT - I

Operating System Overview: Operating System Objectives and Functions - The Evolution of Operating Systems - **Process Description and Control:** What is a Process? - Process States - Process Description - Process Control.

UNIT - II

Threads, SMP, and Microkernels: Processess and Threads - Symmetric Multiprocessing(SMP) - **Concurrency: Mutual Exclusion and Synchronization:** Principles of Concurrency - Mutual Exclusion: Hardware Support - Semaphores.

UNIT - III

Concurrency: Deadlock and Starvation: Principles of Deadlock - Deadlock Prevention - Deadlock Avoidance - Deadlock Detection - **Uniprocessor Scheduling:** Types of Scheduling - Scheduling Algorithms.

UNIT - IV

Memory Management: Memory Management Requirements - Memory Partitioning - Paging - Segmentation - **Virtual Memory:** Hardware and Control Structures - Operating System Software: Fetch Policy - Placement Policy - Replacement Policy - Frame Locking - Basic Algorithms - Page Buffering - Replacement Policy and Cache Size.

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UNIT - V

I/O Management and Disk Scheduling: I/O Devices - Organization of the I/O Function - Operating System Design Issues - I/O Buffering - Disk Scheduling - Disk Cache - **File Management:** File Organization and Access - File Directories - File Sharing - Record Blocking - Secondary Storage Management.

Textbook:

William Stallings, Operating Systems - Internals and Design Principles, Sixth Edition, Prentice Hall, 2009.

Books for Reference:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Principles Seventh Edition, John Wiley & Sons, 2006.
2. Deitel H. M., P.J. Deitel, D.R. Choffnes, Operating Systems, Third Edition, Pearson Education, 2004.
3. Andrew S. Tanenbaum, Albert S.WoodHull, Operating Systems - Design and Implementation, Second Edition, Prentice Hall of India,1997.
4. Achyut S. Godbole, Operating Systems, Second Edition, TataMcGrawHill, New Delhi, 2005.
5. Harsh Marwah, Operating System, First Edition, ANMOL publications Pvt Ltd, 2011.

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SEMESTER - V

Course: Core 11: Client/Server Computing | **Hours per week: 5**

Course Code: 15UAMCT503 | **Credit: 4**

Objective:

To enable the students to learn the Client/Server application development and environment.

UNIT - I

Introduction to Client/Server Computing: Overview of Client/Server Computing - What is Client/Server Computing? - Benefits of Client/Server Computing - **Evolution of Client/Server Computing:** Hardware Trends - Software Trends - Evolution of Operating Systems - Networking Trends - Business Considerations.

UNIT - II

Overview of Client/Server Applications: Components of Client/Server Applications - Classes of Client/Server Applications - Categories of Client/Server Applications - **Understanding Client/Server Computing:** Dispelling the Myths - Obstacles-Upfront and Hidden - Open Systems and Standards - Standards-Setting Organizations - Factors of Success.

UNIT - III

The Client Hardware and Software: Client Components - Client Operating Systems - What is a GUI? - Database Access - **Client Software Products:** GUI Environments - Converting 3270/5250 Screens - Database Access Tools - **Client Requirements:** GUI Design Standards - Open GUI Standards - Interface Independence - Testing Interfaces.

UNIT - IV

The Server: Categories of Servers - Features of Server Machines - Classes of Server Machines - **Server Environment:** Network Management Environment - Network Computing Environment - Extensions - Network Operating System - Loadable Modules.

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UNIT - V

Server Operating Systems: OS/2 2.0 - Windows New Technology - Unix Based Operating System - **Server Requirements:** Platform Independence - Transaction Processing - Connectivity - Intelligent Database - Stored Procedure - Triggers - Load Leveling - Optimizer - Testing and Diagnostic Tools - Backup and Recovery Mechanisms.

Textbook:

Dawna Travis Dewire, Client/Server Computing, Tata McGraw-Hill Edition, Tenth Reprint 2008.

Books for Reference:

1. Patrick Smith, Steve Guengerich, Client/Server Computing, Second Edition, Prentice Hall of India, New Delhi, 2002.
2. Robert Orfali, Dan Harkey and Jeri Edwards, Client/Server Survival Guide, Third Edition, Wiley Computer Publishing, 2007.
3. Jeri Edwards, Three Tier Client Server at Work, John Wiley and Sons, Singapore, 2003.
4. Larry T Vaughn, Client/Server System Design and Implementation, International Edition, McGraw-Hill, 2008.
5. Smith and Guengerich, Client/Server Computing, Prentice Hall of India, New Delhi, 2002.

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SEMESTER - V

Course: Core Lab 5: VB .NET Programming Lab

Course Code: 15UAMCP504

Hours per week: 5

Credit: 4

1. Write a program to design an Arithmetic Calculator using Buttons and Textbox.
2. Write a program to create Digital Clock using Label and Timer.
3. Write a program to create Menus, Status Bars and Tool Bars.
4. Write a program for Keyboard and Mouse events.
5. Write a program to select image from list box and display it in the picture box.
6. Write a program to perform the following basic data manipulations using ADO .NET.
   (i) Insertion (ii) Updation (iii) Deletion
7. Write a program to create web form using Web Control to enter E-Mail registration form.
8. Write a program to apply appropriate Validation techniques in E-mail Registration form using Validation Controls.
9. Develop a web application to retrieve data from the form and display it in the Client browser in table format.
10. Write a program to create an application for College portal.

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SEMESTER - V

Course: Elective - I - A: Multimedia Systems | **Hours per week: 5**

Course Code: 15UAMET505 | **Credit: 4**

Objective:

To enable the students to learn the multimedia technologies and the latest developments in multimedia systems.

UNIT - I

Multimedia - An Overview: Introduction - Multimedia Presentation and Production - Characteristics of a Multimedia Presentation - Multiple Media - Utilities of Multisensory Perception - Hardware and Software Requirements - Uses of Multimedia - **Digital Representation:** Introduction - Analog Representation - Waves - Digital Representation - Analog to Digital Conversion - Digital to Analog Conversion - Quantization Error - Fourier Representation - Pulse Modulation - **Visual Display Systems:** Introduction - Cathode Ray Tube (CRT) - Video Adapter Card - Video Adapter Cable - Liquid Crystal Display (LCD) - Plasma Display Panel (PDP).

UNIT - II

Text: Introduction - Types of Text - Unicode Standard - Font - Insertion of Text - Text Compression - File Formats - **Image:** Introduction - Image Types - Seeing Color - Color Models - Basic Steps for Image Processing - Scanner - Digital Camera - Interface Standards - Specifications of Digital Images - Color Management System (CMS) - Device Independent Color Models - Gamma and Gamma Correction - Image Processing Software - File Formats - Image Output on Monitor - Image Output on Printer.

UNIT - III

Graphics: Introduction - Advantages of Graphics - Uses of Graphics - Components of Graphics System - Coordinate Systems - Line Drawing Algorithms - Circle Drawing Algorithms - Filling Algorithms - Clipping Algorithms - Plotter - Transformations - 3D Graphics - 3D Modeling - Surface Characteristics and Texture - Lights.

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UNIT - IV

Audio: Introduction - Acoustics - Nature of Sound Waves - Fundamental Characteristics of Sound - Musical Note and Pitch - Psycho-Acoustics - Elements of Audio Systems - Microphone - Amplifier - Loudspeaker - Audio Mixer - Digital Audio - Synthesizers - Musical Instrument Digital Interface (MIDI) - MIDI Messages - MIDI Connections - Basics of Staff Notation - Sound Card - Audio Transmission - Audio Recording Devices - Audio File Formats and CODECs - Audio Recording Systems - Audio and Multimedia - Voice Recognition and Response - Audio Processing Software.

UNIT - V

Video: Introduction - Analog Video Camera - Transmission of Video Signals - Video Signal Formats - Television Broadcasting Standards - Digital Video - Digital Video Standards - PC Video - Video Recording Formats and Systems - Video File Formats and CODECs - Video Editing - Video Editing Software - **Compression:** Introduction - Types of Compression - Types of Redundancies - Lossless/Statistical Compression Techniques - GIF Image Coding Standard - Lossy/Perceptual Compression Techniques - JPEG Image Coding Standard - MPEG Standards Overview - MPEG-1 Audio - MPEG-1 Video - MPEG-2 Audio - MPEG-2 Video - MPEG-4 - MPEG-7.

Textbook:

Ranjan Parekh, Principles of Multimedia, Tata McGraw Hill Education, Thirteenth Reprint 2011.

Books for Reference:

1. John F.Koegel Buford, Multimedia Systems, Pearson Education, Sixth Impression, 2009.
2. Tay Vaughan, Multimedia Making it Work, Seventh Edition, Tata McGRAW-Hill Education, New Delhi, Third reprint 2007.
3. Ze-Nianli, Mark S.Drew, Fundamentals of Multimedia, Pearson Educational, New Delhi, Third Impression 2008.
4. Parabhat K. Andleigh, Kiran Thakrar, Multimedia Systems Design , PHI, Second Reprint 2003.
5. Ralf Steinmetz and Klara Nahrstedt, Multimedia Computing Communication and Application, Pearson Education, 2007.

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SEMESTER - V

Course: Elective - I - B: TCP/IP

Course Code: 15UAMET506

Hours per week: 5

Credit: 4

Objective:

To enable the students to learn about the communication protocol of the internet.

UNIT - I

Introduction: History - Protocols and Standards - Standards Organizations - Internet Standards - Internet Administration - **The OSI Model and the TCP/IP Protocol Suite:** The OSI Model - TCP/IP Protocol Suite - Addressing - IP versions.

UNIT - II

Underlying Technologies: Local Area Networks - Point-to-Point WANs - Switched WANs - Connecting Devices.

UNIT - III

IP Addresses: Classful Addressing: Introduction - Classful Addressing - Other Issues - Subnetting and Supernetting - **Classless Addressing:** Variable Length Blocks - Subnetting - Address Allocation - **Delivery, Forwarding and Routing of IP Packets**: Delivery - Forwarding - Routing - Structure of a Router.

UNIT - IV

Internet Protocol: Datagram - Fragmentation - Options - Checksum - IP Package - **User Datagram Protocol:** Process-to-Process Communication - User Datagram - Checksum - UDP Operation - **Transmission Control Protocol:** TCP Services - TCP Feature - Segment - A TCP Connection - State Transition Diagram - TCP Timers - TCP package.

UNIT - V

Domain Name System: Name Space - Domain Name Space - Distribution of Name Space - DNS in the Internet - Resolution - **Remote Login: TELNET:** Concept - Network Virtual Terminal - NVT Character Set - Embedding - Options - Option Negotiation -

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Controlling the Server - Out-of-Band Signaling - Mode of Operation - User Interface - Security Issue - **World Wide Web: HTTP:** Architecture - Web Documents - HTTP.

Textbook:

Behrouz A. Forouzan, TCP/IP Protocol Suite, Third Edition, Tata McGraw- Hill, Thirteenth Reprint 2009.

Books for Reference:

1. Douglas E.Comer, Internetworking with TCP/IP, Volume I, Principles, Protocols, and Architecture, Fifth Edition, Prentice - Hall of India Private Limited, 2007.
2. W.Richard Stevens, G.Gabrani, TCP/IP Illustrated, Volume 1, The Protocols, Pearson Education, First Impression 2006.
3. Libor Dostalek, Alena Kabelova, Understanding TCP/IP, First Edition, Shroff Publishers & Distributors Private Limited, First Indian Reprint January 2007.
4. Robin Burk, Martin Bligh, Thomas Lee, et al, TCP/IP Blue Prints, Techmedia, First Indian Edition 1998.
5. Gray Govanus, TCP/IP 24Seven, BPB Publications, First Indian Edition 1999.

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SEMESTER - V

Course: Elective - I - C: Component Based Technology | **Hours per week: 5**

Course Code: 15UAMET507 | **Credit: 4**

Objective:

To enable the students to learn the fundamental properties, architecture and framework of component based technology.

UNIT - I

Component Technology: Component Concepts - Modules - Interfaces - Callbacks - Directory Services - Component Architecture - Component Based Software Development.

UNIT - II

Java-Based Component Models: Java Beans - Remote Method Invocation (RMI) - RMI-IIOP - **Enterprise Java Beans:** An Introduction - EJB Architecture - Types of Enterprise Beans - Lifecycle of Beans - Steps in Developing an EJB

UNIT - III

CORBA: CORBA Architecture - Object Request Broker (ORB) - Portable Object Adapter - CORBA Services - CORBA Object Location Service - CORBA Component Model - Model-Driven Architecture.

UNIT - IV

Microsoft Component Technologies: Evolution of Microsoft Component Technologies - OLE - ActiveX Controls - Components with ATL - Interface - COM Error Handling - Threading Model and Apartments.

UNIT - V

Component Frameworks and Development: Component Frameworks - Object-Oriented Frameworks (OOFW) - Black-Box Component Framework - Component-Oriented Programming - Component Tools.

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Textbook:

G. Sudha Sadasivam. Component-Based Technology. Wiley India Pvt. Ltd. First Edition. 2008.

Books for Reference:

1. Andreas Vogel, Java Programming with CORBA, John Willey & Sons, 2009.
2. Corry, Mayfield, Cadman, COM/DCOM Primer Plus, Bpb Publications, 2008.
3. Katharine Whitehead. Component-Based Development: Principles and Planning for Business Systems, 1st Edition, Addison Wilsey, 2010.
4. Don Box, Essential COM, Dorling Kingsley, 2006.
5. Andy Ju An, Kai Qian, Component-Oriented Programming, John Wiley & Sons, 2005.

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SEMESTER - V

Course: Skill Based Course 3 (Lab): Multimedia Lab

Hours per week: 3

Course Code: 15UAMSP508

Credit: 3

1. Create a simple logo using Photoshop.
2. Create an own interactive banner using Photoshop.
3. Convert a text into star shape animation using Photoshop.
4. Create an edge mask using Photoshop.
5. Create a realistic stone structure using Photoshop.
6. Create a visiting card using Photoshop.
7. Create a cover page for any text book using Photoshop.
8. Create brochure for college using Photoshop.
9. Convert a black and white photo into color photo using Photoshop.
10. Design texture and patterns using Photoshop.

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SEMESTER - V

Course: Advanced Learners Course 2 - A: Python Programming

Course Code: 15UAMAL509 **Credit: 2**

Objective:

To enable the students to learn the programming concepts, syntax rules and file handling techniques using python programming language.

UNIT - I

Introduction and overview: Introduction - What is Python? - Origins - Comparing Python - Comments - Operators - Variables and Assignment - Numbers - Strings - Lists and Tuples - Dictionaries - if Statement - while Loop - for Loop and the range() Built-in Function - Files and the open() and file() Built-in Functions - Errors and Exceptions - Functions - Classes - Modules - **Python Basics:** Statements and Syntax - Variable Assignment - Identifiers - Basic Style Guidelines - Memory Management.

UNIT - II

Python Objects: Python Objects - Standard Types - Other Built-in Types - Internal Types - Standard Type Operators - Standard Type Built-in Functions - Categorizing the Standard Types - Unsupported Types - **Numbers:** Introduction to Numbers - Integers -Double Precision Floating Point Numbers - Complex Numbers - Operators - Built-in and Factory Functions - **Sequences, Strings:** Sequences - Strings - Strings and Operators - String-only Operators - Built-in Functions - String Built-in Methods - Special Features of Strings.

UNIT - III

Sequences, Lists and Tuples: Operators - Built-in Functions - List Type Built-in Methods - Special Features of Lists - Tuples - Tuple Operators and Built-in Functions -Special Features of Tuples - **Conditionals and Loops:** if Statement - else Statement - elif Statement - while Statement - for Statement - break Statement - continue Statement - pass Statement - else Statement.

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UNIT - IV

Files and Input/Output: File Objects - File Built-in Function - File Built-in Methods - File Built-in Attributes - Standard Files - Command-Line Arguments - File System - File Execution - Persistent Storage Modules.

UNIT - V

Regular Expressions: Introduction - Special Symbols and Characters - REs and Python - **Database Programming:** Python Database Application Programmer's Interface (DB-API) - Object Relational Managers (ORMs).

Textbook:

Wesley J Chun, Core Python Programming, Second Edition, Pearson Education, 2007.

Books for Reference:

1. Paul Barry, Head First Python, Second Edition, O Rielly, 2010.
2. Mueller John Paul, Professional Ironpython, First Edition, O Rielly, 2010.
3. Mcgrath Mike, Python Easy Steps, Mcgraw Hill Education, First Edition 2013.
4. Martin C Brown, Python: The Complete Reference, McGraw Hill Education, Subsequent Edition 2001.
5. John V Guttag, Introduction to Computation and Programming Using Python, Revised and Expanded Edition, PHI Private Limited 2014.

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SEMESTER - V

Course: Advanced Learners Course 2 - B: Cloud Computing

Course Code: 15UAMAL510 **Credit: 2**

Objective:

To enable the students to learn the cloud environment and its components that scale to millions of users in modern internet

UNIT - I

Understanding Cloud Computing: An Introduction to Cloud Computing - A Short History of Cloud Computing - How Cloud Computing Works - The Pros and Cons of Cloud Computing - Who Benefits from Cloud Computing - Why Develop Web-Based Applications? - The Pros and Cons of Cloud Service Development - Types of Cloud Service Development - Discovering Cloud Services Development Services and Tools.

UNIT - II

Cloud Computing for the Family: Centralizing Email Communications - Collaborating on Schedules - Collaborating on Grocery Lists - Collaborating on To-Do Lists - Collaborating on Household Budgets - Collaborating on Contact Lists - Cloud Computing for the Community - Cloud Computing for the Corporation.

UNIT - III

Cloud Services: Collaborating on Word Processing - Collaborating on Spreadsheets - Collaborating on Databases.

UNIT - IV

Storing and Sharing Files and Other Online Content: Understanding Cloud Storage - Evaluating Online File-Storage and Sharing Services - Exploring Online Bookmarking Services - Sharing Digital Photographs - Controlling it All with Web-Based Desktops.

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UNIT - V

Outside the Cloud: Collaborating via Web-Based Communication Tools - Collaborating via Sociai Networks and Groupware - Collaborating via Blogs and Wikis.

Textbook:

Michael Miller, Cloud Computing Web-Based Applications That Change the Way You Work and Collaborate Online, Pearson, Third Impression, 2011.

Books for Reference:

1. Thomas Erl, Zaigham Mahmood, Ricardo Puttini, Cloud Computing Concepts, Technology and Architecture, Pearson Education, First Impression 2013.
2. Rajkumar Buyya, Christian Vecchiola,S.Thamarai Selvi, Mastering Cloud Computing, Tata McGraw Hill Edition, Third reprint, New Delhi, 2013.
3. Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, Cloud Computing A Practical Approach, Tata McGraw Hill Education New Delhi, 2010.
4. Kevin T.Mcdonald, Cloud Computing Managing Risk in the world of cloud computing, First Edition, BPB Publication, 2011.
5. Dr Kumar Saurabh ,Cloud Computing Unleashing Next Gen Infrastructure to application, Third Edition , Wiley India Pvt.Ltd., 2014.

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SEMESTER - VI

Course: Core 12: Open Source Programming | **Hours per week: 6**

Course Code: 15UAMCT601 | **Credit: 4**

Objective:

To enable the students to learn the practices of programming in PHP and mySQL.

UNIT - I

Introduction: Basic Development Concepts - Creating PHP Script - **Variables and Operators:** Storing Data in Variables - Understanding PHP's Data Types - Setting and Checking Variable Data Types - Using Constants - Manipulating Variables with Operators - Handling Form Input.

UNIT - II

Controlling Program Flow: Writing Simple Conditional Statements - Writing Complex Conditional Statements - Repeating Actions with Loops - Working with String and Numeric Functions - **Working with Arrays:** Storing Data in Arrays - Processing Arrays with Loops and Iterators - Using Arrays with Forms - Working with Array Functions - Working with Dates and Times.

UNIT - III

Functions and Classes: Creating User Defined Functions - Creating Classes - Using Advanced OOP Concepts - **Working with Files and Directories:** Reading Files - Writing Files - Processing Directories.

UNIT - IV

Working with Databases and SQL: Introducing Databases and SQL - Using PHP's MySQLi Extension - Adding or Modifying Data - Handling Errors - Using PHP's SQLite Extension - Using PHP's PDO Extension.

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UNIT - V

Cookies and Sessions: Working with Cookies - Working with Sessions - **Securing PHP:** Sanitizing Input and Output - Securing Data - Securing Configuration Files - Securing Database Access - Securing Sessions - Validating User Input - Working with Required Fields - Working with Numbers - Working with Strings - Working with Dates - Configuring PHP Security.

Textbook:

Vikram Vaswani, PHP A Beginners's Guide, McGraw Hill Education (India) Edition, 2009.

Books for Reference:

1. Steven Holzner, The PHP Complete Reference, Tata McGraw-Hill Education (India) Private Limited, 2008.
2. Matt Doyle, Beginning PHP 5.3, Wiley India Private Limited, 2010, Reprint 2012.
3. Mcgrath Mike, PHP programming in Easy Steps, Dream Tech Publication, First Edition 2002.
4. Lerdorf Rasmus, Tatroe Kevin, Macintyre Peter, Programming PHP, Shroff Publishers & Distributors Private Limited, Second Edition, 2006.
5. Josh Lockhart, Modern PHP New Features and Good Practices, O Rielly, 2015.

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SEMESTER - VI

Course: Core Lab 6: Open Source Programming Lab | **Hours per week: 5**

Course Code: 15UAMCP602 | **Credit: 4**

1. Develop a PHP program to display HTML content.
2. Develop a PHP program and check message passing mechanism between pages.
3. Develop a PHP program using control structures.
4. Develop a PHP program using Date and Time functions.
5. Develop a PHP program to read a file, reverse its contents and write the result back into a new file.
6. Develop a PHP program using String function and Arrays.
7. Develop a PHP program to display student information using MYSQL table.
8. Develop a PHP program to design a college application form using MYSQL table.
9. Develop a PHP program using cookie and session.
10. Develop a PHP program for form validation.

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SEMESTER - VI

Course: Elective - II - A: Enterprise Resource Planning | **Hours per week: 6**

Course Code: 15UAMET603 | **Credit: 4**

Objective:

To enable the students to learn Enterprise Resource Planning and SAP.

UNIT - I

ERP: An Overview - Integrated Management Information - Seamless Integration - Supply Chain Management - Resource Management - Integrated Data Model - Benefits of ERP - **Business Engineering and ERP:** What is Business Engineering? - Principles of Business Engineering - Business Engineering with Information Technology.

UNIT - II

Business Modelling for ERP: Building the Business Model - **ERP Implementation:** An Overview - Role of Consultants, Vendors and Users - Customization - Precautions - ERP Post-implementation Options - ERP implementation Methodology - Guidelines for ERP Implementation.

UNIT - III

ERP and the Competitive Advantage: An Overview - ERP and the Competitive Strategy - **The ERP Domain:** MFG/PRO - IFS/Avalon-Industrial and Financial Systems - Baan IV - SAP.

UNIT - IV

SAP R/3: Description of SAP R/3 - Multitier Client/Server Solutions - Open Technology - User Interface - Application Integration.

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UNIT - V

The Architecture of SAP R/3: R/3 Basis Software - Basic Architectural Groups - The System Central Interfaces - **Services:** Work Processes Types - Presentation Interface - Database Interface.

Textbook:

1. Vinod Kumar Garg, N.K. Venkitakrishnan, Enterprise Resource Planning Concepts and Practice, Second Edition, Prentice Hall of India, Private Limited, New Delhi, 2004. (UNIT I,II & III)
2. Jose Antonio Hernandez, SAP R/3 Handbook, Second Edition, Tata McGraw-HILL Edition, 2004. (UNIT IV & V)

Books for Reference:

1. Michael Hammer, Enterprise Resource Planning-Concepts and Practices, Second Edition, Prentice Hall of India, 2004.
2. Alexis Leon, ERP Demystified, Tata McGraw Hill, 2000.
3. Ashim Raj Singla, Enterprise Resource Planning, Cengage Learning India Pvt Ltd, 2008.
4. Ellen F. Monk, Bret J. Wagner, Enterprise Resource Planning, Indian Edition, Cengage Learning India Private Limited, 2009.
5. Pankaj Sharma, Enterprise Resource Planning, APH Publishing Corporation, 2004.

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SEMESTER - VI

Course: Elective II - B: Software Engineering | **Hours per week: 6**

Course Code: 15UAMET604 | **Credit: 4**

Objective:

To enable the students to learn the Software Engineering Principles.

UNIT - I

Introduction to Software Engineering: The Evolving Role of Software - Software - Software Myths - **A Generic View of Process:** Software Engineering - A Layered Technology - A Process Framework - The Capability Maturity Model Integration (CMMI) - **Process Models:** Prescriptive Models - The Waterfall Model - Incremental Process Models - Evolutionary Process Models.

UNIT - II

Requirements Engineering: Requirements Engineering Tasks - Initiating the Requirements Engineering Process - Eliciting Requirements - Developing Use-Cases - Building the Analysis Model - Negotiating Requirements - Validating Requirements.

UNIT - III

Building the Analysis Model: Data Modeling Concepts - Scenario-Based Modeling - Flow Oriented Modeling - Class-Based Modeling - Creating a Behavioral Model - **Design Engineering:** Design Concepts - The Design Model.

UNIT - IV

Testing Strategies: A Strategic Approach to Software Testing - Test Strategies for Conventional Software - Validating Testing - System Testing - **Testing Tactics:** Software Testing Fundamentals - White-Box Testing - Basis Path Testing - Control Structure Testing - Black-Box Testing.

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UNIT - V

Quality Management: Quality Concepts - Software Quality Assurance - Software Reviews - Formal Technical Reviews - Formal Approaches to SQA - Statistical Software Quality Assurance - Software Reliability - The ISO 9000 Quality Standards - The SQA Plan.

Textbook:

Roger S.Pressman, Software Engineering - A Practitioner's Approach, Sixth Edition McGraw - Hill International Edition, 2005.

Books for Reference:

1. Sommerville, Software Engineering, Eighth Edition, Pearson Education Limited, 2007.
2. Ali Behforooz and Frederick J.Hudson, Software Engineering Fundamentals, Indian Edition, Oxford University Press, Fifth Impression 2008.
3. James F.Peters, Witold Pedrycz, Software Engineering - An Engineering Approach, Wiley India Edition, John Wiley & Sons Inc., Reprint 2007.
4. Pankaj Jalote, An Integrated Approach Software to Engineering, Third Edition, Narosa Publishing House, New Delhi, Tenth Reprint 2008.
5. Richard Fairley, Software Engineering Concepts, Tata McGraw-Hill Edition, 35th Reprint 2011.

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SEMESTER - VI

Course: Elective - II - C: Mobile Computing | **Hours per week: 6**

Course Code: 15UAMET605 | **Credit: 4**

Objective:

To enable the students to learn the technologies in Mobile Computing.

UNIT - I

Introduction: Mobility of Bits and Bytes - Wireless The Beginning - Mobile Computing - Dialogue Control - Networks - Middleware and Gateways - Application and Services - Developing Mobile Computing Applications - Security in Mobile Computing - Standards - Why is it Necessary? - Standard Bodies - **Mobile Computing Architecture:** History of Computers - History of Internet - Architecture for Mobile Computing - Three-Tier Architecture - Design Considerations for Mobile Computing - Mobile Computing through Internet - Making Existing Applications Mobile-Enabled.

UNIT - II

Mobile Computing Through Telephony: Evolution of Telephony - Multiple Access Procedures - Mobile Computing through Telephone - Developing an IVR Application - Voice XML - Telephony Application Programming Interface (TAPI) - **Emerging Technologies:** Bluetooth - Radio Frequency Identification (RFID) - Wireless Broadband (WiMAX) - Mobile IP - Internet Protocol Version 6 (IPv6) - Java Card.

UNIT - III

Global System for Mobile Communications (GSM): Global System for Mobile Communications - GSM Architecture - GSM Entities - Call Routing in GSM - PLMN Interfaces - GSM Addresses and Identifiers - Network Aspects in GSM - GSM Frequency Allocation - Authentication and Security - **Short Message Service (SMS):** Mobile Computing over SMS - Short Message Services (SMS).

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UNIT - IV

General Packet Radio Service (GPRS): GPRS and Packet Data Network - GPRS Network Architecture - GPRS Network Operations - Data services in GPRS - Applications for GPRS - Limitations of GPRS - Billing and Charging in GPRS - **Wireless Application Protocol (WAP):** WAP - MMS - GPRS Applications.

UNIT - V

CDMA AND 3G: Spread-Spectrum Technology - Is-95 - CDMA versus GSM - Wireless Data - Third Generation Networks - Applications on 3G.

Textbook:

Asoke K Talukder, Roopa R Yavagal, Mobile Computing Technology, Applications and Service Creation, Tata McGraw - Hill Company Limited, New Delhi, Eleventh Reprint 2009.

Books for Reference:

1. Jochen Schiller, Mobile Communications, Second Edition, Pearson Education, New Delhi, 2004.
2. Uwe Hansmann, Lothar Merk, Martin S.Nicklons and Thomas Stober, Principles of Mobile Computing, Second Edition, Springer, New York, 2003.
3. Ivan Stojmenovic, Hand Book of Wireless Networks and Mobile Computing, John Wiley & Sons, New York, 2002.
4. Mohammad Ilyas Imad Mahgoub, Mobile Computing Hand Book, Amerbach Publications, 2005.
5. Raj Kamal, Mobile Computing, First Edition, Oxford University Press, 2005.

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SEMESTER - VI

Course: Elective - III - A: Artificial Intelligence | **Hours per week: 6**

Course Code: 15UAMET606 | **Credit: 4**

Objective:

To enable the students to apply AI techniques in applications which involve perception, reasoning and learning.

UNIT - I

Introduction: The AI Problems - AI Technique - The Level of the Model - Criteria for Success - Defining the problem as a State Space Search - Production Systems - Problem Characteristics - Production System Characteristics.

UNIT - II

Heuristic Search Techniques: Generate-and-Test - Hill Climbing - Best-first Search - Problem Reduction - Constraint Satisfaction - Means-ends Analysis.

UNIT - III

Knowledge Representation Issues: Representations and Mappings - Approaches to Knowledge Representation - Issues in knowledge Representation - The Frame Problem - **Predicate Logic:** Representing Simple Facts in Logic - Representing Instance and ISA Relationships - Computable Functions and Predicates - Resolution - **Representing Knowledge Using Rules:** Procedural Versus Declarative Knowledge - Logic programming - Forward Versus Backward Reasoning - Matching - Control Knowledge.

UNIT - IV

Game Playing: Overview - The Minimax Search Procedure - Adding Alpha-beta Cutoffs - Additional Refinements - Iterative Deepening - **Planning:** Components of a Planning System - Goal Stack Planning - Nonlinear Planning Using Constraint Posting - Hierarchical Planning - Reactive Systems.

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UNIT - V

Perception and Action: Real-time Search - Perception - Action - Robot Architectures - **Expert Systems:** Representation and Using Domain Knowledge - Expert System Shells - Explanation - Knowledge Acquisition.

Textbook:

Elaine Rich, Kevin knight, Shivashankar B Nair , Artificial Intelligence , Third Edition, McGraw Hill Education, Thirteenth reprint 2014.

Books for Reference:

1. Stuart Russell, Peter Norvig, Artificial Intelligence - A Modern Approach, Second Edition, Prentice Hall of India, 2003.
2. Dan W Patterson, Introduction to AI and Expert Systems, Prentice Hall of India, New Delhi, 2010.
3. Nils J. Nilsson, Artificial Intelligence: A new Synthesis, Harcourt Asia Pvt. Ltd, 2000.
4. George F. Luger, Artificial Intelligence - Structures and Strategies for Complex Problem Solving, Second Edition, Pearson Education, 2008.
5. J. Nilsson, Artificial Intelligence: A new Synthesis, Elsevier Publishers, 1998.

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SEMESTER - VI

Course: Elective - III - B : Cyber Law | **Hours per week: 6**

Course Code: 15UAMET607 | **Credit: 4**

Objective:

To enable the students to learn about the Information Technology Act.

UNIT - I

Cyber Crime and Criminal Justice: Penalties, Adjudication and Appeals Under the IT Act, 2000: Concept of 'Cyber Crime' and the IT Act, 2000 - Hacking - Teenage Web Vandals - Cyber Fraud and Cyber Cheating - Virus on the Internet - Defamation, Harassment and E-mail Abuse - Cyber Pornography - Other IT Act Offences - Monetary Penalties, Adjudication and Appeals Under IT Act, 2000 - Network Service Providers - Jurisdiction and Cyber Crimes - Nature of Cyber Criminality, Strategies to Tackle Cyber Crime and Trends.

UNIT - II

Contracts in the Infotech World: Contracts in the Infotech World - Click-Wrap and Shrink-Wrap Contracts: Status under the Indian Contract Act, 1872 - Contract Formation on the Internet - Terms and Conditions of Contracts - **Jurisdiction in the Cyber World:** Questioning the Jurisdiction and Validity of the Present Law of Jurisdiction - Jurisdiction and the Information Technology Act, 2000 - Jurisdictional Disputes W.R.T the Internet in the United States of America.

UNIT - III

Battling Cyber Squatters and Copyright Protection in the Cyber World: Concept of Domain Name and Reply to Cyber Squatters - Meta-Tagging - The Battle Between Freedom and Control on the Internet - Works in Which Copyright Subsists and Meaning of Copyright - Copyright Protection of Content on the Internet; Copyright Notice, Disclaimer and Acknowledgement - Downloading for Viewing Content on the Internet, Hyper-linking and Framing - Computer Software Piracy.

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UNIT - IV

The Indian Evidence Act of 1872 v. Information Technology Act, 2000: Status of Electronic Records as Evidence - Proof and Management of Electronic Records: Relevancy, Admissibility and Probative Value of E-Evidence - Proving Digital Signatures - Proof of Electronic Agreements - Proving Electronic Messages - Other Amendments in the Indian Evidence Act by the IT Act - Amendments to the Bankers'Books Evidence Act, 1891 and Reserve Bank of India Act, 1934.

UNIT - V

Protection of Cyber Consumers in India: Are Cyber Consumers Covered Under the Consumer Protection Act? - Goods and Services - Consumer Complaint - Defect in Goods and Deficiency in Services - Restrictive and Unfair Trade Practices - Instances of Unfair Trade Practices - Reliefs Under CPA - Beware Consumers - Consumer Foras,Jurisdiction and Implications on Cyber Consumers in India - Applicability of CPA to Manufacturers, Distributors, Retailers and Service Providers Based in Foreign Lands Whose Goods are Sold or Services Provided to a Consumer in India.

Textbook:

Vivek Sood, Cyber Law Simplified, Tata McGraw Hill Publishing Company Limited, New Delhi, Third Reprint 2006 .

Books for Reference:

1. Pavan Duggal, Text Book on Cyber Law Universal Law Publishing, 2014.
2. Jonathan Rosenoer, Cyber Law: The Law of Internet,Springer 1997.
3. Brain Craig, Cyber Law: The Law of Internet and Information Technology, Pearson Education, 2012.
4. Harish Chander, Cyber Laws and IT Protection, PHI Learning Private Limited, 2012.
5. Justice Yatindra Singh, Cyber Laws, Sixth Edition, Universal Law Publishing Co.Pvt.Ltd., 2016.

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SEMESTER - VI

Course: Elective - III - C: Data Mining | **Hours per week: 6**

Course Code: 15UAMET608 | **Credit: 4**

Objective:

To enable the students to learn the knowledge of mining the data bases.

UNIT - I

Introduction: What Motivated Data Mining? Why Is It Important? - What is Data Mining? - Data Mining - On What Kind of Data? - Data Mining Functionalities - What Kinds of Patterns Can Be Mined? - Are All of the Patterns Interesting? - Classification of Data Mining Systems - Data Mining Task Primitives - Major Issues in Data Mining - **Applications and Trends in Data Mining:** Data Mining Applications - Social Impacts of Data Mining - Trends in Data Mining.

UNIT - II

Data Preprocessing: Why Preprocess the Data? - Descriptive Data Summarization - Data Cleaning - Data Integration and Transformation - Data Reduction - Data Discretization and Concept Hierarchy Generation.

UNIT - III

Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and a Road Map - Efficient and Scalable Frequent Itemset Mining Methods: The Apriori Algorithm - Generating Association Rules from Frequent Itemsets - Improving the Efficiency of Apriori - Mining Frequent Itemsets without Candidate Generation - Mining Closed Frequent Itemsets - Mining Various Kinds of Association Rules: Mining Multilevel Association Rules.

UNIT - IV

Classification and Prediction: What Is Classification? - What Is Prediction? - Issues Regarding Classification and Prediction - Classification by Decision Tree Induction: Decision Tree Induction - Attribute Selection Measures - Tree Pruning - Bayesian

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Classification: Bayes' Theorem - Naive Bayesian Classification - Rule Based Classification - Using IF THEN Rules for Classification - Rule Extraction from a Decision Tree - Lazy Learners: K- Nearest Neighbor Classifiers - Prediction: Linear Regression - Nonlinear Regression - Other Regression Based Methods - Accuracy and Error Measures: Classifier Accuracy Measures - Predictor Error Measures.

UNIT - V

Cluster Analysis: What Is Cluster Analysis? - Types of Data in Cluster Analysis - A Categorization of Major Clustering Methods - Partitioning Methods - Hierarchical Methods: Agglomerative and Divisive Hierarchical Clustering - BIRCH: Balanced Iterative Reducing and Clustering Using Hierarchies - ROCK: A Hierarchical Clustering Algorithm for Categorical Attributes - Outlier Analysis.

Textbook:

Jiawei Han and Micheline Kamber, Data Mining Concepts and Techniques, Second Edition, Elsevier Reprinted 2010.

Books for Reference:

1. Margaret H.Dunham, Data Mining Introductory and Advanced Topics, Pearson Publications, Seventeenth Impression 2013.
2. David Hand, Heikki Mannila, Padhraic Smyth, Principles of Data Mining, PHI Learning, New Delhi, 2006.
3. S.Sumathi, S.N.Sivanandam, Introduction to Data Mining and its Applications, Springer International Edition, First Indian Reprint 2009.
4. Alex Berson, Stephen J Smith, Data Warehousing, Data Mining, & OLAP, Tata McGraw-Hill Publishing Company Limited, Eighth Reprint 2006.
5. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Education, Second Impression 2008.

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SEMESTER - VI

Course: Project Work | **Hours per week: 4**

Course Code: 15UAMCV609 | **Credit: 4**

GUIDELINES FOR PROJECT WORK

GENERAL

- Student has to take up the project work for a period of six months.
- The project may be developed using the software package that they have learned from the courses studied or implementation of any innovative idea.
- Guide will be allocated to each student and the project title should be approved by the guide.
- The project work should be compulsorily done in the college only under the supervision of the department staff concerned.
- Students should communicate with their guides regularly about the progress of the project.
- Review Presentation is to be given only on the approval of the guide.
- Rough Draft report should be submitted to their guides after 10 days from Review - II.
- Students should submit one copy of the fair draft report in the form of hard binding during the End Semester Examination after they are duly signed by the concerned guides and the Head of the Department.
- No Students will be permitted to appear for viva voce without the project report.
- The impressions on the typed copies should be black in colour. The font and size should be: **'TimesNewRoman - 12 point'.**
- One and a half spacing should be used for typing the general text and all paragraphs should be justified. The margins should be: Left - 1.25'', Right - 1", Top and Bottom - 0.75". The format for typing Chapter headings, Division headings and Sub-division headings are explained by the following illustrative

Chapter Heading : CHAPTER 1

INTRODUCTION

Division Heading : 1.1 SYSTEM SPECIFICATION

1.1.1 HARDWARE CONFIGURATION

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- All page numbers should be typed in Arabic numbers and the preliminary pages should be numbered in lower case Roman numerals.
- Cover wrapper should be in Silver Grey colour.
- The specimen is annexed along with the Project guidelines.

DISTRIBUTION OF INTERNAL MARKS

S.No.	Parameters	Maximum Marks
1.	Review - I	10
2.	Review - II	15
Total		**25**

DISTRIBUTION OF EXTERNAL MARKS

S.No.	Parameters	Maximum Marks
1.	Project Work	50
2.	Viva voce	25
Total		**75***

* Jointly evaluated by Internal and External Examiners.

A candidate who secures not less than 40% in the end semester examination (external) and 40% marks in the external examination and continuous internal assessment put together shall be declared to have passed the examination in the course .

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STUDENT NAME

REG. NO. :
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Department of Computer Technology and Information Technology

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PROJECT WORK

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TITLE OF THE PROJECT WORK

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Guide **Head of the Department**

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Internal Examiner **External Examiner**

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SEMESTER - VI

Course:

Skill Based Course 4 (Lab): CASE Tools and Software Testing Lab

Hours per week: 3

Credit: 3

Course Code: 15UAMSP610

1. Design a student mark analysis system using UML diagram and to generate C++ code.
2. Design a railway reservation system using UML diagram and to generate C++ code.
3. Design a stock maintenance system using UML diagram and to generate C++ code.
4. Design an E-mail client server system using UML diagram and to generate C++ code.
5. Design an ATM transfer system using UML diagram and to generate C++ code.
6. Write the test cases for banking application.
7. Analyze the reasons for the failure of the matrix multiplication program.
8. Perform the Win Runner Testing tool and analyze the suitable problem and results.
9. Perform the Quick Test Professional tool and analyze the suitable problem and results.
10. Perform the Silk Test Testing tool and analyze the suitable problem and results.

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