B.Sc. Information Technology Programme Code - UIT

Programme outcome - PO (Aligned with Graduate Attributes) - Bachelor of Science (B.Sc.,)

PO1 Scientific Knowledge and Critical Thinking

Apply the knowledge of Life Science, Physical and Chemical Science, Mathematics, statistics, Computer science and humanities for the attainment of solutions to the problems that come across in our day-to-daylife/activities.

PO2 Problem Solving

Identify and analyze the problem and formulate solutions for problems using the principles of mathematics, natural sciences with appropriate consideration for the public health, safety and environmental considerations.

PO3 Communication and Computer Literacy

Communicate the fundamental and advanced concepts of their discipline in written and oral form. Ableto make appropriate and effective use of information and information technology relevant to their discipline.

PO4 Life-Long Learning

Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PO5 Ethical, Social and Professional Understanding

Commitment to principles, codes of conduct and social responsibility in order to behave consistently with personal respect. Acquire the responsibility to contribute for the personal development and for the development of the community. Respect the ethical values, social responsibilities anddiversity.

PO6 Innovative, Leadership and Entrepreneur Skill Development

Function as an individual, and as a member or leader in diverse teams and in multidisciplinary settings. Become an entrepreneur by acquiring technical, communicative, problem solving, intellectual skills.

THIAGARAJAR COLLEGE, MADURAI – 9.
(Re-Accredited with 'A++' Grade by NAAC)
Department of Computer Application and Information Technology

Vision:

- To exhibit innovative and heuristic knowledge in every IT arena with quality and holistic approach.

Mission:

- To facilitate the students to grab knowledge on various sectors of IT industry.
- To enhance the students to present their wisdom on governmental as well as non-governmental services.
- To equip the student to adapt and apply their skill set to acquire higher education opportunities.

Programme Educational Objectives (PEO)

The objectives of this programme is to equip/prepare the students to

PEO1	Equip the students to grab knowledge on various sectors of IT industry.
PEO2	Promote the students with cumulative skill set to provide solutions to a given real world problem using current trends and technology.
PEO3	Deliver a new generation with proficient on fundamental knowledge and recent trends on different disciplines in Information Technology.
PEO4	Facilitate the student to adapt and apply their skill set to acquire higher education opportunities.
PEO5	Enhance the students to present their wisdom on governmental as well as non-governmental services.

Programme specific outcomes- B.Sc.,Information Technology

On the successful completion of B.Sc., Information Technology the students will

PSO1	Acquire fundamental concepts, methods and practices of Information Technology to develop theoretical and practical skill sets.
PSO2	Justify the optimum technique to allocate memory resources, processors, I/O peripherals to provide optimal programmatic solution to a real world problem.
PSO3	Support to gain skills on basic as well as trendy software languages and packages to design web sites, web apps and real time software projects.
PSO4	Promote the students to generalize and distinguish the characters of different systems for different environment.
PSO5	To trigger the students to enroll in to the research areas of IT industry like cloud computing and data analysis.

Thiagarajar College (Autonomous):: Madurai – 625 009
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc. IT on or after June 2023)
Programme Code – UIT
Semester – I

Course	CodeNo.	Subject	Hours	Credits	Total No.of Hours Allotted	Max. Marks CA	Max. Marks SE	Total Marks
Part I	U23P1TA11B	Tamil	3	3	45	25	75	100
Part II	U23P2EN11	English	4	3	60	25	75	100
Core 1	UIT23CT11	Programmingin C	4	3	60	25	75	100
Core 2	UIT23CT12	Computer Organization	4	3	60	25	75	100
Core Lab 1	UIT23CL11	Programmingin C Lab	4	2	60	25	75	100
Generic Elective 1	UMA23GT11S	Generic Elective I (Options Given)	5	3	75	25	75	100
NME	UIT23NT11 (A/B)	(Options Given)	2	2	30	25	75	100
Foundation Course (SEC)	UIT23FT11	Digital Logic Fundamentals	2	2	30	25	75	100
AECC	UIT23AT11	Logical Reasoning I	2	2	30	25	75	100
TOTAL			**30**	23	**450**	**225**	**675**	**900**

Semester-II

Course	CodeNo.	Subject	Hours	Credits	Total No.of Hours Allotted	Max. Marks CA	Max. Marks SE	Total Marks
Part I	U23P1TA21B	Tamil	3	3	45	25	75	100
Part II	U23P2EN21	English	4	3	60	25	75	100
Core 3	UIT23CT21	Java Programming	4	3	60	25	75	100
Core 4	UIT23CT22	Microprocessors and Microcontrollers	4	3	60	25	75	100
Core Lab 2	UIT23CL21	Java Programming Lab	4	2	60	25	75	100
Generic Elective 1	UMA23GT21S	Generic Elective I (Options Given)	5	3	75	25	75	100
NME	UIT23NT21 (C/D)	Options Given	2	2	30	25	75	100
SEC	UIT23SL21 (A/B)	Options Given	2	2	30	25	75	100
AECC	UIT23AT21	Logical Reasoning II	2	2	30	25	75	100
TOTAL			**30**	**23**	**450**	**225**	**675**	**900**
Extra Credit	**U23NM21A**	**Naan Mudhalvan** Language Proficiency for Employability.		**02**				

NME

A. Open Source Technology – NME I

B. Hardware Assembling and Trouble Shooting – NME I

C. Green Computing for Sustainable Development – NME II

D. Internet Security - Principles and Practices - NME II

SEC

A. Digital Design Lab

B. Basics of Web Technology Lab

A) Consolidation of contact hours and credits: B.Sc. IT

Semester	Contact Hrs/ Week	Credits
I	30 hrs	24
II	30 hrs	24
III	30 hrs	
IV	30 hrs	
V	30 hrs	
VI	30 hrs	
Part – V	-	01
Total	180 hrs	140
V	Additional credit (Naan Muthalvan)	2

B) Curriculum Credits: Part wise

		No of papers	Credits per paper	Total credits
Part I	Tamil	2	3	6
Part II	English	2	3	6
Part III	Core Theory	4	3	12
	Core lab	2	2	04
	Core Elective	0		
	Generic Elective Theory	2	4	08
Part IV	AECC	2	2	4
	NME	2	2	4
	SEC	1	2	2
	Foundation Course	1	2	2
Part V (NSS/NCC/Physical Education)				1
Grand total				48

THIAGARAJAR COLLEGE, MADURAI- 9
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc. IT on or
after June 2023)Programme Code –
UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23CT11	**Programming in C**	**Core 1**	**4**	**0**	**0**	**3**

L - Lecture   T - Tutorial   P - Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	**I**	**25**	**75**	**100**

Preamble

To gain knowledge in C language and to inculcate fundamental programming skills.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Remember and understand how to write programs using the basic syntax and semantics in C	82%	80%
CO2	Apply the concepts of functions, macros, arrays, structures, pointers and files in programs to solve problems	83%	81%
CO3	Analyze and understand programs written in C language	85%	82%
CO4	Evaluate the program execution flow with test cases and apply debugging	86%	80%
CO5	Design algorithms and write programs in C language for the given problems.	85%	80%

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	S
CO2	S	M	S	M	M
CO3	M	M	S	M	M
CO4	S	M	S	M	S
CO5	M	S	S	S	S

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	S	S	S
CO2	S	S	S	S	M	S
CO3	S	S	S	M	S	S
CO4	S	M	S	M	S	M
CO5	S	S	S	S	M	S

(S – Strong , M – Medium , L – Low)

Blooms taxonomy

	CA		End of
	First	Second	Semester
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Total marks	52	52	140

Programming in C

Unit - I: 14 Hours

Overview of C: History of C-Importance of C –Sample Program - Printing a Message-Sample Program - Adding Two Numbers- Sample Program - Interest Calculation-Sample Program - Use of Subroutines Sample Program - Use of Math functions-Basic structure of C programs - Programming Style. **Constants, Variables and Data Type:** Introduction –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. **Operators:** Arithmetic operators-Relational operators-Logical operators-Assignment operators-Increment and decrement operators- Conditional operator-Bitwise operators-special operators. **Expressions:** Arithmetic expressions-Evaluation of expressions-Precedence of arithmetic operators-Type conversions in expressions. Reading a character-Writing a character-formatted input- formatted output. **Branching: S**imple If statement-the If… Else statement –Nesting of If- Else statement –The

Else If ladder- The switch statement –The?- operator-The goto statement.

UNIT II: **10 Hours**

Decision making and looping, Introduction-The while statement –The do statement -The for Statement – Jumps In Loops. **Array:** Introduction – One- Dimensional Arrays –Declaration of One- Dimensional Arrays- Initialization of One –Dimensional Arrays-Two Dimensional Arrays-Initializing Two- dimensional Arrays- Multi- dimensional Arrays- Dynamic Array **String:** Introduction–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.

Unit - III: **12 Hours**

User–Defined Functions: Introduction- Need for User-Defined Functions –A Multi-Function Program-Elements of 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-Arguments with Return Values-No Arguments but Returns a Value- Functions that Return Multiple values-Nesting of Functions – Recursion- Passing Arrays to Functions – Passing Strings to Functions.

Unit – IV: **12 Hours**

Structures and Unions: Introduction– Defining a Structure–Declaring Structure Variables – Accessing Structure Members- Structure Initialization-Copying and Comparing Structure Variables-Operations on Individual Members- Arrays of Structures- Arrays within Structures-Structures within Structures-Unions-Size of Structures-Bit Fields.

Unit - V: **12 Hours**

Pointers and File Management: Introduction-Understanding Pointers – Accessing the Address of a Variable- Declaring Pointer Variables- Initialization of Pointer Variables. Pointers and arrays. Introduction-Defining and Opening a File-Closing a File-Input / Output Operations on Files-Error Handling During I/O Operations-Random Access to Files.

Text Books

1. Balagurusamy .E 2019.Programming in C, 8th edition, Tata McGraw – Hill Education Private Limited, NewDelhi.

Unit	Chapters/Page number
I	1(page-1to13.),2(page22to44),3(page51to69),4(page81,82,85,86,94)
II	5(page111to136),6(page149,151,153,156,166,173)7(page189,191,192,194,200,204,212) 8(page234,235,236,242,246,248,249)
III	9(page267to298)
IV	10(page320to339).
V	11(page353to358) 12(page391to402)

Reference Books:

1. Byron S.Gottfried, 2018,"Programming with C", 3rd edition, Tata McGraw–Hill Publications, NewDelhi.

2. Yashwant Kanetkar, 2016,"Let Us C",14th edition, BPB Publications, New Delhi.

Course Designers:
1. Mrs. P. Praveena, Assistant Professor of CA & IT
2. Dr. J.I. Christy Eunaicy, Assistant Professor of CA & IT

Lecture Schedule

Chapter/ Section	Topic	Lecture hours
1.1	**Over view of C:** History of C-Importance of C – Sample Program - Printing a Message-Sample Program – Adding Two Numbers- Sample Program - Interest Calculation-Sample Program - Use of Subroutines Sample Program-Use of Math functions-Basic structure of C programs-Programming Style.	3
1.2	**Constants, Variables and Data Type:** Introduction –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.	3
1.3	**Operators:** Arithmetic operators-Relational operators-Logical operators-Assignment operators-Increment and decrement operators- Conditional operator-Bitwise operators-special operators.	3
1.4	**Expressions:** Arithmetic expressions-Evaluation of expressions-Precedence of arithmetic operators-Type conversions in expressions. Reading a character-Writing a character-formatted input- formatted output. **Branching:** Simple If statement-, If…Else statement– Nesting of If-Else statement–The Else If ladder-The switch statement–The?- operator-The goto statement.	3
2.1	**Decision making and looping,** Introduction-The while statement–The do statement- The for Statement–Jumps In Loops. **String:** Introduction–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.	4

2.2	**Array:** Introduction–One-Dimensional Arrays–Declaration of One-Dimensional Arrays-Initialization of One–Dimensional Arrays-TwoDimensional Arrays-Initializing Two-dimensional Arrays-Multi-dimensional Arrays-Dynamic Array	4
2.3	**String:** Introduction–Declaring and InitializingString Variables –Reading Strings from Terminal- Writing Strings to Screen – Arithmetic Operations on Characters – Putting Strings Together – Comparison of Two Strings- String –Handling Functions.	4
3.1	**User–Defined Functions:** Introduction-Need for User-Defined Functions –A Multi-Function Program-Elements of User-Defined Functions – Definition of Functions-Return Values and Their Types –Function Calls-Function Declaration–	6
3.2	Category of Functions –No Arguments and No Return Values-Arguments but No Return Values-Arguments with Return Values-No Arguments but Returns a Value-Functions that Return Multiple values-Nesting of Functions–Recursion-Passing Arrays to Functions– Passing Strings to Functions.	6
4.1	**Structures and Unions:** Introduction–Defining a Structure–Declaring Structure Variables –Accessing Structure Members-Structure Initialization-Copying and Comparing Structure Variables	6
4.2	Operations on Individual Members-Arrays of Structures- Arrays with in Structures-Structures within Structures-Unions-Size of Structures-Bit Fields.	6
5.1	**Pointers and File Management:** Introduction-Understanding Pointers – Accessing the Address of a Variable- Declaring Pointer Variables-Initialization of Pointer Variables. Pointers and arrays.	6
5.2	Introduction-Defining and Opening a File-Closing a File-Input / Output Operations on Files-Error Handling During I/O Operations-Random Access to Files.	6
	Total Hours	**60**

Thiagarajar College (Autonomous):: Madurai – 625 009
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc. IT on or after June 2023)
Programme Code - UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23CT12	Computer Organization	Core 2	4	0	0	3

L - Lecture   T - Tutorial   P - Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	I	25	75	100

Preamble

Provides the fundamental knowledge on Architecture of computers, and understand the concepts of variousmemories. It presents characteristics of modern-day computer systems.

Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Illustrate the architecture of modern computer system	75%	75%
CO2	Explain the concept of computer function and interconnection.	80%	75%
CO3	Explain the concept of various memories.	80%	75%
CO4	Illustrate the I/O operation and computer arithmetic operation	75%	70%

CO5	Describe the machine instructions and various addressing modes	75%	70%

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	L	S	M
CO2	S	S	M	L	M	M
CO3	S	M	M	M	L	L
CO4	M	L	L	M	L	L
CO5	S	M	M	L	L	L

(S – Strong , M – Medium , L – low

Blooms taxonomy

	CA		End of Semester
	First	**Second**	
Knowledge	**40%**	**40%**	**40%**
Understand	**40%**	**40%**	**40%**
Apply	**20%**	**20%**	**20%**

Computer Organization

Unit I: Introduction   **12 hours**
Introduction: Organization and Architecture, Structure and Function. **Computer Evolution:** A Brief History of Computers, Designing for Performance, Multicore, MICs, and GPGPUs, The Evolution of the Intel x86 Architecture, Embedded Systems.

Unit II: Computer Function, Interconnection and Memory   **12 hours**
Computer Function and Interconnection: Computer Components, Computer Function, Interconnection Structures, Bus Interconnection, Point-To-Point Interconnection. **Cache Memory:** Characteristics of Memory Systems, The Memory Hierarchy, Cache Memory Principles. **Semiconductor Main Memory:** Organization, DRAM and SRAM, Types of ROM,.

Unit III: External Memory   **12 hours**
Magnetic Disk: Magnetic Read and Write Mechanisms, Data Organization and Formatting, Physical Characteristics, Disk Performance Parameters. **RAID:** RAID Level 0 to RAID Level 6. **Solid State Drives:** Flash Memory, SSD Compared to HDD, SSD Organization. **Optical Memory:** Compact Disk, Digital Versatile Disk, High-Definition Optical Disks, Magnetic Tape.

Unit IV: Input/Output and Computer Arithmetic   **14 hours**
Input/Output : External Devices, I/O Modules, Programmed I/O, Interrupt-Driven I/O, Direct Memory Access. **Computer Arithmetic:** The Arithmetic and Logic Unit, Integer Representation:

Sign-Magnitude Representation, Twos Complement Representation. Integer Arithmetic**:** Negation, Addition and Subtraction, Multiplication, Division.

Unit V: The Central Processing Unit   **10 hours**
Elements of a Machine Instruction, Instruction Representation, Instruction Types, Number of Addresses, Types of Operands, Addressing Modes.

Text Books:

1. William Stallings, "Computer Organization and Architecture – Designing for Performance", PearsonEducation, Eleventh Edition, 2021

Unit	Chapters / Sections
I	1 (1.1, 1.2, 1.3, 1.5. 1.6), 2 (2.1, 2.2)
II	3 (3.1 to 3.5), 4(4.2, 4.3), 5(5.1), 6 (6.1)
III	7 (7.1 to 7.5)
IV	8 (8.1 to 8.5), 11 (11.1 to 11.3)
V	13 (13.1, 13.2), 14 (14.1)

References:

1. David A. Patterson and John L. Hennessy, "Computer Organization and Design: TheHardware/Soware interface", Elsevier, Sixth Edition, 2020.
2. Carl Hamacher, ZvonkoVranesic and SafwatZaky, "Computer Organization", Tata McGraw Hill, SixthEdition, 2012

Web Resources:

1. https://www.classcentral.com/course/swayam-computer-organization-and-architecture-apedagogical-aspect- 9824
2. https://onlinecourses.nptel.ac.in/noc20_cs64/
3. https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/

Course Designers:

3. Mr. K. Muthuchamy, Assistant Professor of CA & IT
4. Mr.S. Kumarappan, Assistant Professor of CA & IT

Lecture Schedule:

Unit	Topic	Lecture Hours
I	**Introduction**	
1.1	Organization and Architecture	1
1.2	Structure and Function	2
1.3	**Computer Evolution:** A Brief History of Computers	1
1.4	Designing for Performance	1
1.5	Multicore	1
1.6	MICs	1
1.7	GPGPUs	1
1.8	The Evolution of the Intel x86 Architecture	3
1.9	Embedded Systems	1
II	**Computer Function, Interconnection and Memory**	
2.1	Computer Components	1
2.2	Computer Function	1
2.3	Interconnection Structures	1
2.4	Bus Interconnection	1
2.5	Point-To-Point Interconnection	1
2.6	**Cache Memory:** Characteristics of Memory Systems	1
2.7	The Memory Hierarchy	1
2.8	Cache Memory Principles	1
2.9	**Semiconductor Main Memory:** Organization	1
2.10	DRAM and SRAM	2
2.11	Types of ROM	1
III	External Memory	
3.1	**Magnetic Disk:** Magnetic Read and Write Mechanisms	1
3.2	Data Organization and Formatting	1
3.3	Physical Characteristics1	1
3.4	Disk Performance Parameters	1
3.5	**RAID:** RAID Level 0 to RAID Level 6	3
3.6	**Solid State Drives:** Flash Memory	1
3.7	SSD Compared to HDD	1
3.8	SSD Organization	1
3.9	**Optical Memory:** Compact Disk, Digital Versatile Disk, High-Definition	2
IV	**Input / Output and Computer Arithmetic**	
4.1	**Input / Output :** External Devices	1
4.2	I/O Modules	1
4.3	Programmed I/O	1
4.4	Interrupt-Driven I/O	1
4.5	Direct Memory Access.	1
4.6	The Arithmetic and Logic Unit	1
4.7	Integer Representation: Sign-Magnitude Representation	2
4.8	Twos Complement Representation	1
4.9	Integer Arithmetic**:** Negation, Addition	2
4.10	Subtraction	1
4.11	Multiplication, Division	2
V	**The Central Processing Unit**	
5.1	Elements of a Machine Instruction	2
5.2	Instruction Representation	1

5.3	Instruction Types	2
5.4	Number of Addresses	2
5.5	Types of Operands	1
5.6	Addressing Modes	2
	Total Hours	**60**

THIAGARAJAR COLLEGE, MADURAI- 9
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc. IT on or after June 2023)
Programme Code – UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23CL11	Programming in C Lab	Core Lab 1	0	0	4	2

L - Lecture   T - Tutorial   P - Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	I	25	75	100

Preamble

To implement programming skills using C and to impart knowledge and provide efficient solutions for realtime problems using C language.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Remember and understand how to write programs using the basic syntax and semantics in C	92%	90%
CO2	Apply the concepts of functions, macros, arrays, structures, pointers and files in programs to solve problems	93%	91%
CO3	Analyze and understand programs written in C language	95%	92%
CO4	Evaluate the program execution flow with test cases and apply debugging	96%	80%
CO5	Design algorithms and write programs in C language for the given problems.	95%	90%

Mapping of COs with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	S
CO2	S	M	S	M	M
CO3	M	M	S	M	M
CO4	S	M	S	M	S
CO5	M	S	S	S	S

(S – Strong , M – Medium , L – Low)

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	S	S	S
CO2	S	S	S	S	M	S
CO3	S	S	S	M	S	S
CO4	S	M	S	M	S	M
CO5	S	S	S	S	M	S

(S – Strong , M – Medium , L – Low)

Bloomstaxonomy

	CA		End of
	First	Second	Semester
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Total marks	52	52	140

Programming in C Lab

UNIT I: **4 Hours**
Variables, Data types, Constants and Operators
1. Evaluation of expression ex: $((x+y)^2 * (x+z))/w$
2. Temperature conversion problem (Fahrenheit to Celsius)
3. Program to convert days to months and days (Ex: 364 days = 12 months and 4 days)
4. Solution of quadratic equation
5. Salesman salary (Given: Basic Salary, Bonus for every item sold, commission on the totalmonthly sales)

UNIT II: **10 Hours**
Decision making Statements
6. Maximum of three numbers
7. Calculate Square root of five numbers (using goto statement)
8. Pay-Bill Calculation for different levels of employee (Switch statement)
9. Fibonacci series
10. Floyds Triangle
11. Pascal's Triangle

Unit III: **12 Hours**
Arrays, Functions and Strings
12. Prime numbers in an array
13. Sorting data (Ascending and Descending)
14. Matrix Addition and Subtraction
15. Matrix Multiplication

16. Function with no arguments and no return values
17. Function that convert lower case letters to upper case
18. Factorial using recursion.
19. Perform String Operations using Switch Case.

Unit IV :   **12 Hours**

    Structures and Macros

20. Structure that describes a Hotel (name, address, grade, avg room rent, number of rooms)Perform some operations (list of hotels of a given grade etc.)
21. Using Pointers in Structures.
22. Cricket team details using Union.

Unit V :   **12 Hours**

    Pointers and Files

23. Evaluation of Pointer expressions
24. Function to exchange two pointer values
25. Program to read a file and print the data.
26. Program to receive a file name and a line of text as command line arguments and write the textto the file
27. Program to copy the content of one file to another file.

Text Books:

1. E. Balagurusamy, "Programming in ANSI C", 8th Edition, Tata McGraw-Hill, 2019.

References:

1. Byron Gottfried, "Schaum's Outline Programming with C", Fourth Edition, Tata McGraw-Hill, 2018.

Web Resources:

1. https://www.tutorialspoint.com/cprogramming
2. https://www.javatpoint.com/c-programming-language-tutorial
3. https://www.w3schools.in/category/c-tutorial

Course Designers:

1. Mrs. P. Praveena, Assistant Professor of CA & IT
2. Dr.J.I. Christy Eunaicy, Assistant Professor of CA & IT

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Programme Code - UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23FT11	Digital Logic Fundamentals	Foundation Course	2	0	0	2

L - Lecture   T - Tutorial   P - Practical

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	I	25	75	100

Preamble

To facilitate with the knowledge of Digital Logic Circuits and Systems and to understand how data is represented and processed within a computer system.

Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Classifies the various number systems and perform various number conversions	85%	80%
CO2	Identify the different logic gates and its functionality	85%	80%
CO3	Analyze the Booleans laws and theorem and their corresponding combinational logic circuits .	80%	70%
CO4	Illustrate the different data-processing circuits	75%	70%
CO5	Perform various binary arithmetic operations	75%	70%

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	L	L
CO2	S	L	M	M	L
CO3	M	M	S	L	L
CO4	M	S	L	M	M
CO5	L	S	S	M	L

(S – Strong , M – Medium , L – Low)

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M	S	L	L	L
CO2	S	L	M	M	L	L
CO3	M	M	S	L	L	L

| CO4 | M | S | L | M | M | L |
| CO5 | M | S | S | M | L | L |

(S – Strong , M – Medium , L – Low)

(S – Strong , M – Medium , L – Low)

Blooms Taxonomy

	CA		End of
	First	**Second**	**Semester**
Knowledge	**40%**	**40%**	**40%**
Understand	**40%**	**40%**	**40%**
Apply	**20%**	**20%**	**20%**

Digital Logic Fundamentals

Unit I: Number Systems and Codes   6 hours

Number Systems and Codes, Binary Number System, Binary-to-decimal Conversion, Decimal-to-binary Conversion, Octal Numbers , Hexadecimal Numbers , The ASCII Code , The Excess-3 Code , The Gray Code .

Unit II: Digital Logic   6 hours

The Basic Gates-NOT, OR, AND, Universal Logic Gates-NOR, NAND, AND-OR-Invert Gates,Positive And Negative Logic

Unit III: Combinational Logic Circuits   6 hours
Boolean Laws and Theorems, Sum-of-Products Method ,Truth Table to Karnaugh Map ,Pairs, Quads, and Octets, Karnaugh Simplifications ,Don't-care Conditions ,Product-of-sums Method ,Product-of-sums Simplification..

Unit IV: Data-Processing Circuits   6 hours
Multiplexers,Demultiplexers,1-of-16 Decoder, BCD-to-decimal Decoders, Encoders, Exclusive-OR Gates, Parity Generators and Checkers.

Unit V: Arithmetic Circuits   6 hours
Binary Addition, Binary Subtraction, Unsigned Binary Numbers, Sign-magnitude Numbers, 2's Complement Representation, 2's Complement Arithmetic, Arithmetic Building Blocks, The Adder-subtracter.

Text Books:

1. Donald P.Leach , Albert Paul Malvino, GoutamSaha, 2014. Digital Principles and Applications, 8th edition, Tata McGraw – Hill Publications, New Delhi.

References:

1. Morris Mano, 2014.Digital Logic & Computer Design, 5th edition , Prentice Hall of Indiapublishing, New Delhi..
2. Carl Hamacher, ZvonkoVranesic and SafwatZaky, "Computer Organization", Tata McGraw Hill, Sixth Edition, 2012

Web Resources:

1. https://soaneemrana.org/onewebmedia/DIGITAL%20PRINCIPLES%20AND%20APPLICATION%20BY%20LEACH%20&%20MALVINO.pdf
2. https://www.tutorialspoint.com/digital_circuits/index.htm
3. https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/
4. https://circuitverse.org/simulator

Course Designers:

1. Mr.S. Kumarappan, Assistant Professor of CA & IT
2. Mr.K.Muthusamy, Assistant Professor of CA & IT

Lecture Schedule

Chapter/ Section	Topic	Lecture hours
1.1	Number Systems and Codes, Binary Number System, Binary-to-decimal Conversion, Decimal-to-binary Conversion,	3
1.2	Octal Numbers, Hexadecimal Numbers, The ASCII Code, The Excess-3 Code, The Gray Code.	3
2.1	The Basic Gates-NOT, OR, AND, Universal Logic Gates-NOR.	3
2.2	NAND, AND-OR-Invert Gates,Positive And Negative Logic	3
3.1	Boolean Laws and Theorems, Sum-of-Products Method ,Truth Table to Karnaugh Map ,Pairs, Quads,and Octets	3
3.2	Karnaugh Simplification,Don't-care Conditions ,Product-of-sums Method ,Product-of-sums Simplification.	3
4.1	Multiplexers,Demultiplexers,1-of-16 Decoder, BCD-to-decimal Decoders, Encoders	3
4.2	Exclusive-OR Gates, Parity Generators and Checkers.	3
5.1	Binary Addition, Binary Subtraction, Unsigned Binary Numbers, Sign-magnitude Numbers.	3
5.2	2's Complement Representation, 2's Complement Arithmetic, Arithmetic Building Blocks, The Adder-subtracter.	3
	Total Hours	**30**

THIAGARAJAR COLLEGE, MADURAI- 9
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc. IT on or after June 2023)
Programme Code – UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23AT11	Logical Reasoning I	AECC	2	-	-	2

L-Lecture   T-Tutorial   P–Practical S

Year	Semester	Internal	External	Total
1	I	25	75	100

Preamble

Facilitates to solve various quantitative and aptitude problems, along with the verbal, non verbalreasoning and promotes in placement.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Recall and apply Series completion, Number series, Alphabet series, Alpha numeric series, Continuous Pattern series.	76%	73%
CO2	Solve problems in Analogy, Completing the Analogous pair, Direct/Simple Analogy, Double Analogy.	76%	73%
CO3	Find the solution of Coding-Decoding: Letter coding, Direct letter coding, number/symbol coding and Substitution	72%	68%
CO4	Discuss various Blood relations ,Deciphering jumbled up descriptions, Relation puzzle and Direction sense Test	75%	73%
CO5	Explain the concept of Mathematical operations, Problem solving by substitution, Interchange of signs and Numbers	78%	76%

Mapping of COs with Programme Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M

CO2	M	M	M	M	L
CO3	L	L	M	S	M
CO4	S	M	S	M	S
CO5	S	S	S	S	S

(S-Strong   M-Medium   L-Low)

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M	M	M	S	S
CO2	S	L	L	L	M	L
CO3	S	M	L	M	M	M
CO4	S	M	M	S	S	S
CO5	S	S	M	M	S	S

(S-Strong   M-Medium   L-Low)

Blooms taxonomy

	CA		End of Semester
	First	Second	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%
Total marks	52	52	140

Logical Reasoning I

Unit I: 7 hours

Series: Series completion–Number series- Alphabet series-Alpha- numeric series-Continuous Pattern series.

Unit II: 5 hours

Analogy: Completing the Analogous pair-Direct/Simple Analogy-Choosing the Analogous pair-Double Analogy-Choosing a similar word

Unit III: 7 hours

Coding-Decoding: Letter coding-Direct letter coding–number/symbol coding–Substitution

Unit IV: 5 hours

Blood relations: Deciphering jumbled up descriptions-Relation puzzle-Direction sense Test

Unit V: **6 hours**
Mathematical operations: Problem-solving by substitution-Interchange of signs and Numbers

Unit	Chapters/Section
I	1(1.3-1.18)
II	2(2.6-2.52)
III	4(4.1-4.27)
IV	5(5.1-5.6),8(8.1-8.19)
V	13(13.1-13.6)

Text Books:

1. Aggarwal R.S, 2021, A Modern Approach To Verbal & Non Verbal Reasoning , S. Chand& Company Pvt. Ltd, New Delhi.

References:

1. Aruna Sharma, "How to prepare for Logical Reasoning for CAT", 2019,5th Edition, MCGraw Hill.
2. AbhijitGuha,2014, Quantitative Aptitude for Competitive Examinations,5thedition,TataMcGraw–Hill Publications, New Delhi.
3. Sijwali BS, InduSijwali, 2014, A New Approach to Reasoning Verbal & Non-Verbal Paper back, Arihant Publication

Web Resources:

1. Https:www.careerbless.com
2. https://www.indiabix.com/aptitude/profit-and-loss/
3. https://www.handakafunda.com/pipes-and-cisterns-concepts-properties-and-cat-questions/

Course Designers:

1. Mrs. M.B.C. Ashavani, Assistant Professor of CA & IT
2. Mrs. P. Praveena, Assistant Professor of CA & IT

Lecture Schedule

Chapter/ Section	Topic	Lecture hours
1.1	Series: Series completion–Number series- Alphabet series	4
1.2	Alpha- numeric series-Continuous Pattern series.	3
2.1	Analogy: Completing the Analogous pair- Direct/Simple Analogy-	3
2.2	Choosing the Analogous pair- Double Analogy- Choosing a similar word	2
3.1	Coding-Decoding: Letter coding-	3

3.2	Direct letter coding–number/symbol coding–Substitution	4
4.1	Blood relations: Deciphering jumbled up descriptions-	2
4.2	Relation puzzle-Direction sense Test	3
5.1	Mathematical operations: Problem-solving by substitution	3
5.2	Interchange of signs and Numbers	3
	Total Hours:	**30**

Thiagarajar College(Autonomous)::Madurai–625009
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc.IT on or after June2023)
Programme Code- UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23CT21	**Java Programming**	Core3	4	-	-	3

L - Lecture   T - Tutorial   P - Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	**II**	25	75	100

Preamble

      This course will guide to the Java language, describing its syntax, keywords, and fundamental programming principles. It significances the java latest API library and programming environment. To implement logic and improvements the art of programming

Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Classify and apply the core programming Logics with Inference variable and var args.	75%	70%
CO2	State there as on of inheritance, concurrency, and usage of nested and inner Class.	75%	70%
CO3	Able to create user defined package and interface, Handle Exception Cases in java programming.	73%	65%
CO4	Perform Multi-Threading. Compute the method of Java‟s Wrappers classes and String Manipulation.	68%	62%
CO5	Design a Graphical user interfaces using AWT Controls and Exploring Swing.	65%	60%

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	M	S	M
CO2	S	S	S	M	S	M
CO3	S	S	M	M	M	S
CO4	S	S	M	M	S	S
CO5	S	S	M	M	M	S

(S–Strong , M–Medium, L – Low)

Mapping of Course Outcomes with Program Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	M	M
CO2	S	S	M	M	M
CO3	M	M	S	S	S
CO4	S	M	S	M	L
CO5	S	S	S	M	L

(S–Strong , M–Medium, L – Low)

Blooms taxonomy

	CA		End of Semester
	First	**Second**	
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%

Java Programming

Unit I: **10 hours**

The History and Evolution of Java: The Creation of Java-How Java Impacted the Internet–Java Applets-Security–Portability-Java"s Magic: The Byte code–Moving Beyond Applets–A Faster Release Schedule Servlets: Java on the Server Side – The Java Buzzwords – **An Overview of Java:** Object-Oriented Programming –Two Paradigms–Abstraction–The Three OOP Principles. **Data Types, Variables and Arrays:** Java Is a Strongly Typed Language–The Primitive Types–A Closer Look at Literals–Dynamic Initialization–The Scope and Life time of Variables–Type Conversion and Casting – The Type Promotion Rules - Arrays-Alternative Array Declaration Syntax –Introducing Type Inference with Local Variables-Some var Restrictions **Operators–Control Statements**- **Introducing Classes Class Fundamentals:** The General Form of a Class–A Simple Class– Constructors– Parameterized Constructors–Garbage Collection –A Stack Class

Unit II: **14 hours**

A Closer Look at Methods and Classes : Overloading Methods – Overloading Constructors Using Objects as Parameters -Understanding static – Introducing final-**Introducing Nested and Inner Classes**–Using Command-Line Arguments- **Varargs:** Variable Length Arguments Overloading –Vararg Methods – **Inheritance** :InheritanceBasics Using super - Method Overriding –Dynamic Method Dispatch. –Using AbstractClasses–Local Variable Type Inference and Inheritance-The Object Class.

Unit III: **12 hours**

Packages and Interfaces: Packages–Defining a Package–Finding Packages and CLASSPATH A Short Package- Example Packages and Member Access – An Access –Example – Importing Packages-Interfaces–Defining an Interface–Implementing Interfaces -Nested Interfaces – Applying Interfaces Variables in Interfaces. **Exception Handling:** Exception– Handling Fundamentals – Exception Types- Uncaught Exceptions - Multiple catch Clauses–Nested try Statements-throw–throws-finally-Java"s Built-in Exceptions. Creating Your OwnException.

Unit IV: **12 hours**
      Multithreaded Programming: The Java Thread Model – Thread Priorities - Synchronization-The Thread Class and the Runnable Interface - The Main Thread -Creating a Thread–Implementing Runnable-Extending Thread-Choosing an Approach– Creating Multiple Threads. **Auto boxing :** Types Wrappers–Character– Boolean– The Numeric Type Wrappers. Auto boxing and Methods-Auto boxing / Unboxing Occurs in Expressions.

Unit V: **12 hours**
      String Handling: The String Constructors-String Length–String Operations –String Buffer– String Buffer methods–String Builder Classes. **Introducing the AWT:** Working with Windows, Graphics and Text-AWT Classes–Window Fundamentals- Component–Container–Panel–Window-Frame. Canvas- Working with Frame Windows. **Introducing Graphics :** Drawing Lines–Drawing Rectangles–Drawing Ellipses and Circles - Drawing Arcs-Drawing Polygons. **Introducing GUI Programming with Swing:** Introducing Swing – The Origins of Swing – Swing Is Built on the AWT –Two Key Swing Features - Components and Containers –The Swing Packages – A Simple Swing Application-Exploring Swing - JLabel and ImageIcon – Jtext Field – The Swing Buttons – Jbutton - JToggleButton – CheckBoxes - RadioButtons - JTabbedPane –JscrollPane – JList JComboBox –Trees –JTable -JMenuBar.

Text Books:
1. Herbert Schildt, 2019,"*Java The Complete Reference"*, Eleventh Edition, OraclePress, New Delhi.

Unit	Chapters/Section
I	1, 2, 3,4,5,6.
II	7,8.
III	9, 10.
IV	11,12(page466 – page475)
V	17,25,32,33 (page 1622 –page 1630).

References:

1. Allen B.Downey & ChrisMayfield, 2020, *Think Java*, O‟reilly Media Inc Sebastopol, CA.
2. E Balagurusamy, 2019, *A Programming with JAVA*, McGraw Hill Education (India) PrivateLimited,6th Edition.
3. D.T.EditorialServices,2015,*Java8 Programming Black Book*, Dreamtech Press, New Delhi

Web Resources:
1. https://www.tutorialspoint.com/java/index.htm
2. https://www.w3schools.com/java/
3. https://www.javatpoint.com/java-tutorial
4. https://docs.oracle.com/javase/tutorial/

Course Designers:
1. Mr. S. Kumarappan, Assistant Professor of CA&IT
2. Mrs. M. Gayathiri, Assistant Professor of CA&IT

Lecture Schedule:

Chapter/ Section	Topic	Lecture hours
1.1	**The History and Evolution of Java:** The Creation of Java-How Java Impacted the Internet–Java Applets-Security–Portability-Java‟s Magic: The Byte code – Moving Beyond Applets–A Faster Release Schedule Servlets: Java on the Server Side – The Java Buzzwords	2
1.2	**An Over view of Java:** Object-Oriented Programming–Two Paradigms–Abstraction–The Three OOP Principles.	2
1.3	**Data Types, Variables and Arrays:** Java Is a Strongly Typed Language–The Primitive Types–A Closer Look at Literals–Dynamic Initialization–The Scope and Life time of Variables–Type Conversion and Casting – The Type Promotion Rules -Arrays-Alternative Array Declaration Syntax–Introducing Type Inference with Local Variables-Some var Restrictions	3
1.4	**Operators–Control Statements-Introducing Classes Class Fundamentals:** The General Form of a Class–A Simple Class–Constructors–Parameterized Constructors–Garbage Collection–A Stack Class	3
2.1	**A Closer Look at Methods and Classes:** Over loading Methods–Overloading Constructors Using Objects as Parameters-Understanding static–Introducing final	4
2.2	**Introducing Nested and Inner Classes** – Using Command-Line Arguments-**Varargs:** Variable Length Arguments Overloading –Vararg Methods	4

2.3	**Inheritance** :Inheritance Basics Using super-Method Overriding–Dynamic Method Dispatch.–Using Abstract Classes–Local Variable Type Inference and Inheritance-The Object Class.	6
3.1	**Packages:** Packages–Defining a Package–Finding Packages and CLASSPATH A Short Package-Example Packages and Member Access-An Access –Example –Importing Packages.	3
3.2	**Interfaces**–Defining an Interface– Implementing Interfaces-Nested Interfaces Applying Interfaces Variables in Interfaces.	3
3.3	**Exception Handling:** Exception– HandlingFundamentals–ExceptionTypes- UncaughtExceptions-	3
3.4	Multiple catch Clauses–Nested try Statements-throw–throws-finally-Java"s Built-in Exceptions. Creating Your Own Exception.	3
4.1	**Multithreaded Programming:** The Java Thread Model – Thread Priorities - Synchronization-The Thread Class and the Runnable Interface.	4
4.2	The Main Thread-Creating a Thread– Implementing Runnable-Extending Thread- Choosing an Approach– Creating Multiple Threads..	4
4.3	**Autoboxing :**Types Wrappers–Character– Boolean– The Numeric Type Wrappers. Autoboxing and Methods- Autoboxing / Unboxing Occurs in Expressions	4
5.1	**String Handling:** The String Constructors-String Length–String Operations–String Buffer–String Buffer methods–String Builder Classes.	4
5.2	**Introducing the AWT:** Working with Windows, Graphics and Text-AWT Classes–Window Fundamentals-Component–Container–Panel– Window-Frame. Canvas.-Working with Frame Windows.	4
5.3	**Introducing Graphics :**Drawing Lines–Drawing Rectangles–Drawing Ellipses and Circles – Drawing Arcs-Drawing Polygons.	4
	Total Hours	60

Thiagarajar College(Autonomous)::Madurai– 625009
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc.IT on or after June2023)
Programme Code –UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23CT22	Microprocessors and Microcontrollers	Core4	4	0	0	3

L-Lecture   T-Tutorial   P– Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	II	25	75	100

Preamble

Depicts the various concepts of 8086 microprocessor and 8051 microcontroller for better understanding and useful for exercises.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Describe 8086 Microprocessor architecture, instruction set and the importance of Assembly language program.	85%	82%

CO2	Sketch out the Bus structure, I/O Programming and advanced processors.	82%	80%
CO3	Depict the concept of the memory and IO interfacing and DMA controller.	75%	72%
CO4	Describe the concept to micro controller, architecture, registers, Instruction set and Addressing Mode.	73%	70%
CO5	Develop the system using 8051 micro controller and recognize the Interrupt Programming.	81%	80%

Mapping of Course Outcomes with Program Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	S	L	M
CO2	S	L	M	M	M
CO3	L	M	S	L	M
CO4	L	S	L	M	L
CO5	S	S	M	L	L

(S–Strong , M–Medium, L – Low)

Mapping of Course Outcome with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	L	S	L	M	L
CO2	S	L	M	M	M	M
CO3	L	M	S	L	M	L
CO4	L	S	L	M	L	M
CO5	S	S	M	L	L	M

Blooms taxonomy:

	CA		End of Semester
	First	Second	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Microprocessors and Microcontrollers

Unit-I: The 8086 Microprocessors   9 hours

Introduction to Microprocessor - Introduction to 8086 – 8086 Microprocessor Architecture – Addressing Modes – Instruction Set – Classification of 8086 Instructions – Introduction to Assembly

Language Programming – Assembly Language Program Development tools.

Unit-II: 8086 System Bus Structure   9 hours

   8086 Signals – Basic Configurations – System Bus Timing – System Design using the 8086 – IO Programming – Introduction to advanced Processors

UNIT – III: IO Interfacing   15 hours

Introduction to Memory – IO Interfacing – Parallel communication Interface – Serial communication Interface – DMA Controller – Intel 8257

Unit–IV: Microcontroller   15 hours

   Introduction to Microcontroller - Introduction to the Intel 8051 Microcontroller – Architecture of 8051 – Special function register(SFR) of 8051 – 8051 Instruction Set – 8051 Addressing Mode.

Unit - V: Microcontroller Interfacing   12 hours

System Design using the 8051 Microcontroller – Programming 8051 Timers – Serial Port Programming – Interrupt Programming – Sensor Interface in 8051.

Text Book
   1.   Nagoor Kani.A,2022, Microprocessor And Microcontroller, CBS Publishers & Distributors Private Limited, New Delhi.

UNIT	CHAPTERS/SECTIONS
I	**Chapter 1**: 1.1.1 - 1.1.2, 1.2, 1.3, 1.4, 1.5, 1.6, 1.8, 1.9
II	**Chapter 2**: 2.1, 2.2, 2.3, 2.4, 2.5, 2.9,2.9.1, 2.9.6
III	**Chapter 3**: 3.1, 3.2, 3.3, 3.5, 3.6, 3.13
IV	**Chapter 4**: 4.1, 4.2, 4.3, 4.4, 4.7, 4.8
V	**Chapter 5**: 5.1, 5.2 – 5.2.2, 5.3 – 5.3.3, 5.4 – 5.4.4, 5.9 – 5.9.1

Reference Books:

1. Ramesh Gaonkar, 2015, Microprocessor Architecture programming and applications with the8085,Sixth edition, PenRam International Publishing(India) Pvt. Ltd, Mumbai.

2. Krishna Kant, 2016, Microprocessors and Microcontrollers, Second Edition by PHI Learning Private Ltd., New Delhi.

3. Peter Abel, 2015, IBMPC Assembly Language And Programming" Fifth Edition by PEARSON, New Delhi.

Course Designers:

1. Dr. J.I Christy Eunaicy, Assistant Professor of CA&IT

2. Mrs. M. Gayathiri, Assistant Professor of CA&IT

Lecture Schedule:

Chapter/ Section	Topic	Lecture hours
1.1-1.2	Introduction to Microprocessor - Introduction to 8086 – 8086 Microprocessor Architecture	2
1.3 -1.5	AddressingModes–InstructionSet– Classificationof8086Instructions	3
1.6, 1.8-1.9	Introduction to Assembly Language Programming – Assembly Language Program Development tools.	4
2.1 -2.3	8086 Signals – Basic Configurations – System Bus Timing	3
2.4 – 2.5	System Design using the8086–IOProgramming	3
2.9	IO Programming – Introduction to advanced Processors	3
3.1-3.2	Introduction to Memory – IO Interfacing	4
3.3-3.6	Parallel communication Interface–Serial communication Interface	6
3.13	DMA Controller – Intel 8257	5
4.1-4.2	Introduction to Microcontroller - Introduction to the Intel 8051 Microcontroller	5
4.3-4.4	Architecture of 8051 – Special function register(SFR) of 8051	5
4.7-4.8	8051 Instruction Set – 8051 Addressing Mode.	5
5.1-5.2	System Design using the 8051 Microcontroller	4
5.3-5.4	Programming 8051 Timers – Serial Port Programming	4
5.9	Interrupt Programming – Sensor Interface in 8051.	4
	Total Hours:	60

Thiagarajar College(Autonomous)::Madurai–625009
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc.IT on or after June2023)
Programme Code- UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23CL21	Java Programming Lab	CoreLab2	0	0	4	2
	L-Lecture T-Tutorial P –Practicals					

Year	Semester	Max.Marks CA	Max.Marks SE	Total
I	II	25	75	100

Preamble

Demonstrate the working of Classes & objects along with constructors, Arrays and Vectors. Understanding the principles of inheritance, interface and packages and demonstrate though problem analysis assignments. Apply the Java Swings for designing GUI applications.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Implement Object Oriented programming concept using Basic syntaxes of control Structures.	75%	75%
CO2	Demonstrates how to achieve reusability using inheritance, interfaces and packages	75%	70%
CO3	Demonstrate understanding and use of different t exception handling mechanisms and concept of Multithreading for robust.	70%	65%
CO4	Identify ,Design & develop complex Graphical use Interfaces .	68%	65%
CO5	Implement Menu Bar components in a small applications.	65%	60%

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	L	S	M
CO2	S	S	M	L	M	M
CO3	S	M	M	M	L	L
CO4	M	L	L	M	L	L
CO5	S	M	L	M	M	S

(S–Strong , M–Medium, L – Low)

Mapping of Course Outcomes with Program Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	L	S
CO2	S	M	M	M	S
CO3	S	L	M	L	S
CO4	S	M	L	M	M
CO5	S	M	L	M	M

(S–Strong, M–Medium, L – Low)

Blooms taxonomy

	CA		End of Semester
	First	Second	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Java Programming Lab

SI. No	Topic
1	Program to define a class, and instantiate its object
2	Demonstrating Method Overloading and Constructor Overloading
3	Program to create Arrays and vectors
4	Program to Demonstrate Var-Args
5	Working with strings using String, String Buffer and String Builder classes.
6	Program to implement inner class.
7	Program to implement Wrapper classes and their methods
8	Program to implement inheritance and demonstrating method overriding
9	Creating Interface and implementing polymorphism.
10	Program to Demonstrate Local Variable Type Inference
11	Creating and importing user defined packages.
12	Developing Multithreading by extending Thread Class
13	Program to perform multithreading by implementing Runnable Interface.
14	Exception Handling using multiple try catch
15	Creating user defined exceptions and handling using throw keyword.
16	Design Graphical User Interface by using AWT Classes
17	Java Program to demonstrate Graphics class.

Course Designer:

1. Mrs .M .Gayathiri, Assistant Professor of CA&IT
2. Mr. S. Kumarappan, AssistantProfessor of CA&IT

THIAGARAJAR COLLEGE, MADURAI- 9
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc. IT on or after June 2023)
Programme Code – UIT

Course Code	Course Title	Category	L	T	P	Credits
UIT23AT21	Logical Reasoning II	AECC	2	0	0	2

L – Lecture   T – Tutorial   P - Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	II	25	75	100

Preamble

Provoke knowledge to solve logical Reasoning problems and formulate to compete competitive exams for higher education and placement.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Discuss arithmetic reasoning on age, venn - diagram	96%	89%
CO2	Discourse how to find out Missing Character in a series of characters, Explains how to Reaction for a Situation	97%	85%
CO3	Deliberate about statement it's assumptions, arguments and conclusions	98%	88%
CO4	Illuminate how to derive conclusions from passage.	96%	80%
CO5	Analysis of reasoning, Problems on dice.	95%	90%

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	S
CO2	S	M	S	M	M
CO3	M	M	S	M	M
CO4	S	M	S	M	S
CO5	M	S	S	S	S

(S – Strong, M – Medium, L – Low)

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	M	M	M
CO2	S	S	M	M	M	M
CO3	M	M	S	S	S	S
CO4	S	M	L	M	M	M
CO5	S	M	S	M	M	M

(S – Strong , M – Medium , L – Low)

Blooms taxonomy

	CA		End of
	First	Second	Semester
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Total marks	52	52	140

Logical Reasoning II

Unit I :   **6 hours**
   Arithmetic Reasoning: Type1: Calculation Based Problems Type2: Data Based Questions Type3: Problems on Age. Type4: Venn–Diagram Based Questions.

Unit II :   **5 hours**
   Inserting the Missing Character – Data Sufficiency – Assertion and Reason – Situation Reaction Test – Verification of Truth of the Statement.

Unit III :   **7 hours**
 Logical Deduction: Logic: Type 1: Two Premise Arguments. Type2: Three Premise Arguments.– **Statement - Argument**. - **Statement-Assumptions** – Type1. **Statement-Conclusions** – Type1.

Unit IV: **7 hours**
   Deriving Conclusions From Passages – Theme Detection – Cause and Effect Reasoning. Series: PART II: NON VERBAL REASONING Type1:Five Figure Series. – Type2:Three and Four Figure Series.

Unit V :   **5 hours**
   Type3: Choosing missing Figure in a Series. **Analogy:** Type 1: Choosing one element of a Similarly Related Pair. **Analytical Reasoning** - Problems on Dice.

Text Books:

1. Dr. R.S. Aggarwal "A Modern Approach to Verbal & Non- Verbal Reasoning", Reprint 2021, S. Chand &

company Ltd.

Unit	Chapters(pages)
I	15.1 to 15.7
II	16.1 to 16.4, 17.1 to 17.3, 19.1 to 19.4, 20.1 to 20.3 21.1 to 21.2
III	Section II 1.1 to 1.10, 1.11, 1.17, 1.19.1.34 2.1 to 2.3 3.1 to 3.3 5.1 to 5.3
IV	6.1 to 6.3 7.1 to 7.3 8.1 to 8.3 PART II: NON VERBAL REASONING 1.1 to 1.6, 1.91 to 1.94
V	2.1 to 2.3 4.1 to 4.5 14.29 to 14.31

References:

1.Aruna Sharma, "How to prepare for Logical Reasoning for CAT", 2019,5th Edition, MC Graw Hill.

2. Abhijit Guha, 2014, Quantitative Aptitude for Competitive Examinations,5thedition,TataMcGraw–Hill Publications, New Delhi.

3. Sijwali BS, InduSijwali, 2014, A New Approach to Reasoning Verbal & Non-Verbal Paper back, Arihant Publication

Web Resources:
https://www.tutorialspoint.com/reasoning/index.htm
https://www.javatpoint.com/reasoning

Course Designers:
1. Mrs. P. Praveena, Assistant Professor of CA&IT
2. Mrs. M.B.C. Ashavani, Assistant Professor of CA&IT

Lecture Schedule

Chapter/ Section	Topic	Lecture hours
1.1	**Arithmetic Reasoning:** Type1: Calculation Based Problems Type2: Data Based Questions	3
1.2	Type3: Problems on Age. Type4: Venn–Diagram Based Questions.	3

2.1	Inserting the Missing Character – Data Sufficiency – Assertion and Reason –	2
2.2	Situation Reaction Test – Verification of Truth of the Statement.	3
3.1	**Logical Deduction: Logic:** Type 1: Two Premise Arguments. Type2: Three Premise Arguments.	4
3.2	**Statement-Argument**. - **Statement-Assumptions** – Type1. **Statement-Conclusions** – Type1.	3
4.1	**Deriving Conclusions From Passages – Theme Detection – Cause and Effect Reasoning.**	4
4.2	**PART II: NON VERBAL REASONINGSeries:**Type1: Five Figure Series. – Type2: Three and Four Figure Series.	3
5.1	Type3: Choosing missing Figure in a Series. **Analogy:** Type 1: Choosing one element of a Similarly Related Pair.	3
5.2	**Analytical Reasoning** - Problems on Dice.	2
	Total Hours	**30**

NME

Thiagarajar College (Autonomous):: Madurai – 625 009
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc. IT on or after June 2023)
Programme Code – UIT

Course Code	Course Title		Category	L	T	P	Credit
UIT23NT11A	Open Source Technology		NME I	2	-	-	2
	L-Lecture	T-Tutorial		P–Practicals			
Year	Semester		Max. Marks CA	Max. Marks SE		Total	
I	I		25	75		100	

Preamble

   To provide a basic idea of Open source technology, their software development process to understand the role and future of open source software in the industry along with the impact of legal, economic and social issues for such software.

Course Outcomes

On the completion of the course the student will be able to

	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Describe various Open source Principles and various free software	85%	82%
CO2	Explain the Methodology, Philosophy, platform, Income generation of Open source Techniques	82%	80%
CO3	Demonstrate the case studies of various open source products.	75%	72%
CO4	Discuss Open source projects, maintenance and Hardware design	73%	70%
CO5	Recognize Open source ethics, shared software and Source.	75%	65%

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	M	S	M
CO2	S	S	S	M	S	M
CO3	S	S	M	M	M	S
CO4	S	S	M	M	S	S
CO5	S	S	S	M	M	S

(S – Strong, M – Medium, L – Low)

Mapping of Course Outcomes with Program Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	M
CO2	S	M	S	M	L
CO3	M	L	M	S	M
CO4	M	S	M	M	M
CO5	M	L	S	M	L

(S – Strong , M – Medium , L – Low)

	CA		End of Semester
	First	**Second**	
Knowledge	**40%**	**40%**	**40%**
Understand	**40%**	**40%**	**40%**
Apply	**20%**	**20%**	**20%**

Open Source Technology

UNIT I: **6 hours**

Introduction – Why Open Source – Open Source –Principles, Standards Requirements, Successes – Free Software – FOSS – Internet Application Projects.

UNIT II   **6 hours**

Open source – Initiatives, Principles, Methodologies, Philosophy, Platform, Freedom, OSSD, Licenses – Copy right, Copy left, Patent, Zero Marginal Technologies, Income generation opportunities, Internalization.

UNIT III   **6 hours**

Case Studies – Apache, BSD, Linux, Mozilla (Firefox), Wikipedia, Joomla, GCC, Open Office

UNIT IV   **6 hours**

Open Source Project –Starting, Maintaining –Open Source – Hardware, Design, Teaching & Media.

UNIT V   **6 hours**

Open Source Ethics – Open Vs Closed Source – Government – Ethics – Impact of Open source Technology – Shared Software – Shared Source.

Text Books:

1. Kailash Vedera, Bhavyesh Gandhi ,2018,"Open Source Technology" , University SciencePress, New Delhi,

References:

1. Forge Your Future with Open Source: Build Your Skills. Build Your Network. Build the Future of Universe, 2018, VM (Vicky) Brasseur

WebResources:

1. https://madhavuniversity.edu.in/open-source-echnology.html#:~:text=Open%20source%20software%20is%20software,its%20design%20is%20publicly%20accessible.
2. https://www.computerscience.org/resources/computer-programming-languages/

Course Designers:

1. Dr. J.I. Christy Eunaicy, Assistant Professor of CA&IT
2. Mrs. P. Praveena, Assistant Professor of CA&IT

Lecture Schedule:

Chapter/ Section	Topic	Lecture hours
1.1	Introduction – Why Open Source – Open Source – Principles	2
1.2	Standards Requirements, Successes – Free Software	2
1.3	FOSS – Internet Application Projects	2
2.1	Open source – Initiatives, Principles, Methodologies,	2
2.2	Philosophy, Platform, Freedom, OSSD, Licenses	2
2.3	Copy right, Copy left, Patent, Zero Marginal Technologies, Income generation opportunities, Internalization	2
3.1	Case Studies – Apache, BSD	2
3.2	Linux, Mozilla (Firefox), Wikipedia	2
3.3	Joomla, GCC, Open Office	2
4.1	Open Source Project –Starting, Maintaining	3
4.2	Open Source – Hardware, Design	2
4.3	Teaching& Media	1
5.1	Open Source Ethics – Open Vs Closed Source – Government – Ethics	3
5.2	Impact of Open source Technology – Shared Software – Shared Source.	3
	Total Hours:	**30**

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc. IT on or after June 2023)
Programme Code - UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23NT11B	Hardware Assembling and Troubleshooting	NME -I	2	0	0	2

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	I	25	75	100

Preamble

Understand the basics computer hardware devices and known to troubleshoot problems in CPU and its peripheral devices. Give knowledge to upgrade, troubleshoot, and maintain your PC

Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Identify the Personal Computer hardware components	85%	80%
CO2	Understands the functionality of Memory in PC	80%	75%
CO3	Classify the Motherboard parts and it controlling resources.	80%	70%
CO4	Illustrate the functionality of various mass storage devices	75%	70%
CO5	Find and operate I/O ports and Devices	85%	80%

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	L	M
CO2	M	L	M	S	L
CO3	S	M	S	L	L
CO4	M	S	L	M	M
CO5	L	M	S	M	M

(S – Strong , M – Medium , L – Low)
Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	M	S	L	M	M
CO2	M	L	M	M	M	M
CO3	S	L	S	L	L	M
CO4	S	M	L	M	M	L
CO5	M	.M	S	M	L	L

(S – Strong , M – Medium , L – Low)

Blooms Taxonomy

	CA		End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Hardware Assembling and Troubleshooting

UNIT I :   **6 hours**

PC Components: Fundamentals of PC Technology - Fundamental Building Blocks of the PC - Principles of CPU Operation. **The Microprocessor:** CPU Operation - CPU Terminology – PC Family Tree - Troubleshooting the CPU.

UNIT II :   **6 hours**

Memory: Memory Chips and Modules –Parity Checking and ECC – DRAM Timing and Memory Types - Troubleshooting Memory.

UNIT III :   **6 hours**

Motherboards: Motherboard Controllers and System Resources - The I/O System Bus – Chip Sets – RAM BIOS – CMOS setup – Motherboard Physical Form Factors.

UNIT IV :   **6 hours**

Magnetic Storage Devices: Magnetic Storage – The Hard Disk Drives – Floppy Disk Drive – Cartridge Drive. **Optical Storage Devices**: Optical Storage Media-CD-ROM Drive – DVD ROM Drive- Recordable Drives.

UNIT V: **6 hours**

I/O Ports and Devices: Serial Ports – Parallel Ports – Universal Serial Bus. **Keyboard and Pointing devices**: Keyboards – Keyboard Troubleshooting – Pointing Devices – Pointing Devices Troubleshooting.

Text Books:

Craig Zacker , John Rourke : 2015. "The Complete Reference PC Hardware", Tata MCGraw Hill Education Private Ltd, New Delhi.

References:

1. Michael Meyers : 2003. "Introduction to PC Hardware and Troubleshooting", Tata MCGraw Hill Education Private Ltd, New Delhi

2. Kenneth C. Mansfield, & James L. Antonakos, (2000). Personal Computer Hardware and Troubleshooting Reference Guide. (1st edition). New Delhi: Prentice Hall.

Web Resources:

1. https://www.tutorialspoint.com/computer_fundamentals/computer_hardware.htm
2. https://www.javatpoint.com/hardware
3. https://www.geeksforgeeks.org/computer-hardware/
4. https://www.bleepingcomputer.com/tutorials/hardware/

Course Designers:

1. Mr. S. Kumarappan, Assistant Professor of CA & IT
2. Mr. K.Muthuchamy, Assistant Professor of CA & IT

Lecture Schedule:

Chapter/ Section	Topic	Lecture hours
1.1	**PC Components**: Fundamentals of PC Technology - Fundamental Building Blocks of the PC	2
1.2	Principles ofCPU Operation. **The Microprocessor:** CPU Operation	2
1.3	CPU Terminology – PC Family Tree - Troubleshooting the CPU.	2
2.1	**Memory**: Memory Chips and Modules –Parity Checking and ECC	3
2.2	DRAM Timing and Memory Types - Troubleshooting Memory.	3
3.1	**Motherboards**: Motherboard Controllers and System Resources - The I/O System Bus	3
3.2	Chip Sets – RAM BIOS – CMOS setup – Motherboard Physical Form Factors.	3
4.1	**Magnetic Storage Devices**: Magnetic Storage – The Hard Disk Drives – Floppy Disk Drive – Cartridge Drive.	3
4.2	**Optical Storage Devices**: Optical Storage Media-CD-ROM Drive – DVD ROM Drive-Recordable Drives.	3
5.1	**I/O Ports and Devices**: Serial Ports – Parallel Ports – Universal Serial Bus.	3
5.2	**Keyboard and Pointing devices**: Keyboards – Keyboard Troubleshooting – Pointing Devices – Pointing Devices Troubleshooting.	3
	Total Hours:	**30**

Thiagarajar College (Autonomous):: Madurai – 625 009
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc. IT on or after June 2023)
Programme Code - UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23NT21C	Green Computing for Sustainable Development	NME -II	2	0	0	2

L – Lecture   T – Tutorial   P - Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	II	25	75	100

Preamble

Enflame knowledge on Green Computing tools and techniques for saving energy, money and resources for sustainable development of the environment.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Depict the carbon foot print issues current initiatives on it.	93%	88%
CO2	Describe how to minimize power consumption and Signifies the cooling	90%	85%
CO3	Represent changing in the way of work to paperless world	92%	90%
CO4	Entail Recycling and hardware considerations along with it.	94%	89%
CO5	Portray how green our information system and how stay green	95%	93%

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	S
CO2	S	M	S	M	M
CO3	M	M	S	M	M
CO4	S	M	S	M	S
CO5	M	S	S	S	S

(S – Strong , M – Medium , L – Low)

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	M	M	M
CO2	S	S	M	M	M	M
CO3	M	M	S	S	S	S
CO4	M	M	S	M	M	M
CO5	S	M	S	M	M	M

(S – Strong , M – Medium , L – Low)

Blooms taxonomy

	CA		End of
	First	Second	Semester
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Total marks	52	52	140

Green Computing for Sustainable Development

Unit I: **6 hours**

OVERVIEW ISSUES: Introduction- An overview and Issues related to it:- How can it be solved- Precautions to be taken and how to do it- Company's Carbon Footprint- Measuring and Expertising projects- Other ways to reduce the occurring issues.

CURRENT INITIATIVES AND STANDARDS: Introduction - Global Initiatives - STEP principles - Task Forces - Policy and Legislation -ReDesign - ReUse - ReCycle -Capacity Building - Basel Action Network (BAN) - Functions - Involvement in Campaigns - Basel Convention - Application - Additional Regulation - European Union - WEEE Directive - RoHs - National Adoption

Unit II: **7 hours**

MINIMIZING POWER USAGE: Introduction - Power Problems - Monitoring Power Usage - Servers, - Low-Cost Options - Reducing Power Use - Data De-duplication - Virtualization - Management - Bigger Drives - Involving the Utility Company - Low-Power Computers-PCs, Linux - Components - Servers - Computer Settings – Storage - Monitors - Power Supplies - Wireless Devices - Software.

COOLING: Introduction - Cooling Costs - Power Cost - Causes of Cost 4.6 Calculating Cooling Needs - Reducing Cooling Costs – Economizers - On-Demand Cooling - HP's Solution - Optimizing Airflow-Fluid Considerations - System Design - Data Centre Design - Centralized Control - Designs for Your Needs - Put Everything Together

Unit III: **5 hours**

CHANGING THE WAY OF WORK: Old Behaviors - Starting at the Top - Process Reengineering with Green in Mind -Analyzing the Global Impact of Local Action- Steps - Water - Recycling - Energy - Pollutants - Teleworkers and Outsourcing - Telecommuting - Outsourcing - How to Outsource

GOING PAPERLESS: Paper Problems - The Environment - Costs - Paper and Office - Practicality

- Storage - Destruction Going Paperless - Organizational Realities - Changing Over - Paperless Billing - Handheld Computers vs. the Clipboard - Unified Communications - Intranets - What to Include - Building an Intranet - Microsoft Office SharePoint Server - Electronic Data Interchange (EDI) -Nuts and Bolts - Value Added Networks - Advantages - Obstacles

Unit IV: **5 hours**

   RECYCLING: Problems - China - Africa - Materials - Means of Disposal - Recycling - Refurbishing - Make the Decision Life Cycle - from beginning to end - Life - Cost - Green Design - Recycling Companies - Finding the Best One - Checklist Certifications

   HARDWARE CONSIDERATIONS: Introduction - Certification Programs - EPEAT - RoHS - Energy Star – Computers- Monitors – Printers- Scanners-All-in-Ones - Thin Clients - Servers - Blade Servers - Consolidation - Products -Hardware Considerations - Planned Obsolescence - Packaging - Toxins - Other Factors - Remote Desktop - Using Remote Desktop - Establishing a Connection

Unit V: **7 hours**

   GREENING YOUR INFORMATION SYSTEMS: Introduction – Initial Improvement Calculations -Selecting Metrics - Power Usage Effectiveness (PUE) – Data centre Efficiency (DCE) - Datacenter Density - Storage Utilization - Storage Density - CPU Utilization – SwaP - Tracking Progress - BI Tools - MS SQL Server - Microsoft Performance Point - Change Business Processes - ImproveTechnology Infrastructure.

   STAYING GREEN: Introduction - Organizational Check-ups - Chief Green Officer - Evolution - Convince the CEO - SMART Goals - Equipment Check-ups - Gather Data - Tracking the Data - Baseline Data - Benchmarking - Analyze Data - Conduct Audits - Certifications - Benefits of Certification - Realities - Helpful Organizations

Text Books:

1. Bud E. Smith," Green Computing Tools and Techniques for Saving Energy, Money and Resources", 2014,CRC Press

Unit	Chapters(pages)
I	1.1 to 1.7 2.1 to 2.8
II	3.2 to 3.22 4.2 to 4.26
III	5.1.1 to 5.3.3 6.1 to 6.5.4
IV	7.1 to 7.4.2 9.1 to 9.6.2
V	10.1 to 10.12 11.1 to 11.5

References:

1. Green IT, Toby Velte, Anthony Velte, Robert Elsenpeter, McGraw Hill, 2018.
2. Green Data Center: Steps for the Journey, Alvin Galea, Michael Schaefer, Mike Ebbers, Shroff Publishers and Distributors, 2011.

Web Resources:

https://www.tutorialspoint.com/reasoning/index.htm
https://www.javatpoint.com/reasoning

1. Mrs. P. Praveena, Assistant Professor of CA & IT
2. Mrs.M. Gayathiri, Assistant Professor of CA & IT

Lecture Schedule

Chapter/ Section	Topic	Lecture hours
1.1	**OVERVIEW ISSUES:** Introduction- An overview and Issues related to it:- How can it be solved- Precautions to be taken and how to do it- Company's Carbon Footprint- Measuring and Expertising	3

		projects- Other ways to reduce the occurring issues.	
1.2		**CURRENT INITIATIVES AND STANDARDS:** Introduction - Global Initiatives - STEP principles - Task Forces - Policy and Legislation -ReDesign - ReUse - ReCycle -Capacity Building - Basel Action Network (BAN) - Functions - Involvement in Campaigns - Basel Convention - Application - Additional Regulation - European Union - WEEE Directive - RoHs - National Adoption	3
2.1		**MINIMIZING POWER USAGE:** Introduction - Power Problems - Monitoring Power Usage - Servers, - Low-Cost Options - Reducing Power Use - Data De-duplication - Virtualization - Management - Bigger Drives - Involving the Utility Company - Low-Power Computers-PCs, Linux - Components - Servers - Computer Settings – Storage - Monitors - Power Supplies - Wireless Devices - Software.	4
2.2		**COOLING:** Introduction - Cooling Costs - Power Cost - Causes of Cost 4.6 Calculating Cooling Needs - Reducing Cooling Costs – Economizers - On-Demand Cooling - HP's Solution - Optimizing Airflow- Fluid Considerations - System Design - Data Centre Design - Centralized Control - Designs for Your Needs - Put Everything Together	3
3.1		**CHANGING THE WAY OF WORK:** Old Behaviors - Starting at the Top - Process Reengineering with Green in Mind -Analysing the Global Impact of Local Action- Steps - Water - Recycling - Energy - Pollutants - Teleworkers and Outsourcing - Telecommuting - Outsourcing - How to Outsource	2
3.2		**GOING PAPERLESS:** Paper Problems - The Environment - Costs - Paper and Office - Practicality - Storage - Destruction Going Paperless - Organizational Realities - Changing Over - Paperless Billing - Handheld Computers vs. the Clipboard - Unified Communications - Intranets - What to Include - Building an Intranet - Microsoft Office SharePoint Server - Electronic Data Interchange (EDI) -Nuts and Bolts - Value Added Networks - Advantages – Obstacles.	3
4.1		**RECYCLING:** Problems - China - Africa - Materials - Means of Disposal - Recycling - Refurbishing - Make the Decision Life Cycle - from beginning to end - Life - Cost - Green Design - Recycling Companies - Finding the Best One - Checklist Certifications	3

| 4.2 | **HARDWARE CONSIDERATIONS:** Introduction - Certification Programs - EPEAT - RoHS - Energy Star – Computers- Monitors – Printers- Scanners- All-in-Ones - Thin Clients - Servers - Blade Servers - Consolidation - Products -Hardware Considerations | 2 |

	- Planned Obsolescence - Packaging - Toxins - Other Factors - Remote Desktop - Using RemoteDesktop - Establishing a Connection	
5.1	**GREENING YOUR INFORMATION SYSTEMS:** Introduction - Initial Improvement Calculations -Selecting Metrics - Power Usage Effectiveness (PUE) - Data centre Efficiency (DCE) - Datacenter Density - Storage Utilization - Storage Density - CPU Utilization – SwaP - Tracking Progress - BI Tools - MS SQL Server - Microsoft Performance Point - Change Business Processes - Improve Technology Infrastructure.	3
5.2	**STAYING GREEN:** Introduction - Organizational Check-ups - Chief Green Officer - Evolution - Convince the CEO - SMART Goals - Equipment Check-ups - Gather Data - Tracking the Data - Baseline Data - Benchmarking - Analyze Data - Conduct Audits - Certifications - Benefits of Certification - Realities - Helpful Organizations	4
	Total Hours	**30**

Thiagarajar College (Autonomous):: Madurai – 625 009
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc. IT on or after June 2023)
Programme Code - UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23NT21D	Internet Security – Principles & Practices	NME -II	2	-	-	2

L - Lecture   T - Tutorial   P – Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	II	25	75	100

Preamble

Equip foundational understanding of the threats to the Internet infrastructure and to understand the practical principles, models, cryptographic methods for protecting Internet from various forms of attacks

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Project the Security Policies & Techniques for security attacks	75%	75%
CO2	Express Data Encryption Techniques, Digital Signature, Email Security	72%	70%
CO3	Deal out Web Security	72%	65%
CO4	Portray Malicious Software	75%	70%
CO5	Dispense the concept of digital immune system & Firewall Protection	68%	62%

Mapping of Course Outcomes with Program Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	M
CO2	S	S	S	M	M
CO3	S	M	S	M	M
CO4	S	S	M	M	M
CO5	S	S	S	M	S

(S – Strong, M – Medium, L – Low)

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	M	M	S

CO2	S	S	S	M	M	S
CO3	S	S	S	M	M	S
CO4	S	S	S	M	M	S
CO5	M	S	S	S	M	S

(S – Strong, M – Medium, L – Low)

Blooms taxonomy

	CA		End of
	First	**Second**	**Semester**
Knowledge	**40%**	**40%**	**40%**
Understand	**40%**	**40%**	**40%**
Apply	**20%**	**20%**	**20%**

Internet Security Principles & Practices

Unit I :   **6 hours**
        Introduction: Security – Elements of Information Security – Security Policy – Security Techniques – Steps for Better Security – Category of Computer Security – The operational model of Network Security – Security Services – Basic Network Security Terminology – Security Attacks.

Unit II: **6 hours**
        Data Encryption Techniques: Introduction – Encryption Methods – Cryptography – **Authentication :** Introduction – Authentication Methods – **Digital Signatures –** Introduction - **Electronic Mail Security:** Introduction – Pretty Good Privacy – MIME – S/MIME – Comparison of PGP & S/MIME.

Unit III: **5 hours**
Web Security: Secure Electronic Transaction – Importance of SET – Set Mechanism – Key Elements of SET – Key elements of SET – Strengths of SET – Weaknesses of SET.

Unit IV: **7 hours**
Malicious Software: Introduction – Malicious code – Viruses – Worms – Trojans or Trojan Horses – Spyware – Bots – Best Practices – Digital Immune System – Attacks.
Unit V: **6 hours**
Firewall: Introduction – Characteristics of Firewall – Types of Firewall – Benefits of Firewall – Limitations of Firewall

Text Books:

1. V.K.Pachghare, 2015 "*Cryptography and Information Security*" , PHI Learning Private Limited, Delhi.

Unit	Chapters(pages)
1	1(1.1 to 1.10)
	2(2.1 to 2.3)
	9(9.1 to 9.2)
	10 (10.1.1 to 10.1.3)
	11 (11.1 to 11.5)
2	13(13.8)
	15(15.1 to 15.10)
	16(16.1 to 16.5)

References:

1. William Stallings, 2017, "*Cryptography and Network Security: Principles and Practice*", Pearson Indian Education Services.
2. Raef Meeuwisse , 2015, "*Cyber security for Beginners*" ,Cyber Simplicity ltd.
3. William Stalling, 6th Edition, 2013,"*Data & Computer Communication*", Pearson Education, Prentice Hall of India, New Delhi.

Web Resources:

1. https://www.tutorialspoint.com/internet_technologies/internet_security_overview.htm
2. https://www.slideshare.net/iuvmtech/internet-security-tutorial
3. https://www.digitalvidya.com/blog/cyber-security-tutorial/
4. https://www.w3schools.in/category/cyber-security/
5. http://patrickmcdaniel.org/pubs/www04-tutorial.pdf

Course Designers:
1. Mrs. P. Praveena, Assistant Professor of CA & IT
2. Mrs.M.Gayathiri, Assistant Professor of CA & IT

Lecture Schedule

Chapter/ Section	Topic	Lecture hours
1.1	**Introduction:** Security – Elements of Information Security – Security Policy – Security Techniques – Steps for Better Security – Category of Computer Security	3
1.2	The operational model of Network Security – Security Services – Basic Network Security Terminology – Security Attacks.	3
2.1	**Data Encryption Techniques**: Introduction – Encryption Methods – Cryptography – **Authentication:** Introduction – Authentication Methods.	4
2.2	**Digital Signatures –** Introduction - **Electronic Mail Security:** Introduction – Pretty Good Privacy – MIME – S/MIME – Comparison of PGP & S/MIME.	3
3.1	**Web Security:** Secure Electronic Transaction – Importance of SET – Set Mechanism	2
3.2	Key Elements of SET – Key elements of SET – Strengths of SET – Weaknesses of SET.	3
4.1	**Malicious Software:** Introduction – Malicious code – Viruses – Worms – Trojans or Trojan Horses –	4
4.2	Spyware – Bots – Best Practices – Digital Immune System – Attacks.	3

5.1	**Firewall:** Introduction – Characteristics of Firewall – Types of Firewall,	3
5.2	Benefits of Firewall – Limitations of Firewall	2
	Total Hours	**30**

Thiagarajar College (Autonomous):: Madurai – 625 009
DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined B.Sc. IT on or after June 2020)

Programme Code – UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23SL21A	Digital Design Lab	SEC	-	-	2	2

L - Lecture   T - Tutorial   P – Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	II	25	75	100

Preamble

Introduction to Digital Circuit Ics specifications and Digital lab kit to demonstrate the working logic of digital signals. IC – 7408,7432,7400,7402,7404,74136 are verified by truth tables.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcomes	Expected Proficiency	Expected Attainment
CO1	Identify the basics digital ICs specification and it's functions.	85%	80%
CO2	Implement the Boolean functions using ICs	85%	83%
CO3	Design new simple circuit for the given bollean equation.	80%	78%
CO4	Implement the Decoder and Encoder logics	75%	73%
CO5	Apply the working logic of Flip-Flops	75%	73%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	M
CO2	S	S	S	M	S
CO3	S	M	S	M	M
CO4	S	S	M	M	S
CO5	S	S	S	M	S

Strong –S, Medium-M, Low-L

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	L	L	L

CO2	S	M	M	M	M	M
CO3	L	M	S	L	M	L
CO4	M	S	L	M	L	L
CO5	L	S	M	L	L	M

Strong –S, Medium-M, Low-L

Blooms taxonomy: Assessment Pattern

	CA		End of Semester
	First	Second	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Digital Design Lab Apparatus Required

Digital lab kit, single strand wires, breadboard, TTL IC's.

Sl. No.	Topic
1	Verification of truth tables of logic gates-AND using TTL ICs..
2	Verification of truth tables of logic gates-OR using TTL ICs..
3	Verification of truth tables of logic gates-NOT using TTL ICs..
4	Implementation and verification of universal logic gate-NAND.
5	Implementation and verification of universal logic gate-NOR
6	Implementation and verification of Advanced logic gate-XOR
7	Implementation of Given Boolean Function using logic gates in Sum of Product(SOP)
8	Implementation of Given Boolean Function using logic gates in Product Of Sum(POS)
9	Justifying the Boolean Equation using Combinational Logic Circuits.
10	Justifying the De Morgan's Law using Combinational Logic Circuits.
11	Design, and verify the Binary Half adder and Full adder by Logic Circuits.
12	Design, and verify the Binary Half subtracter and Full subtracted by Logic Circuits.
13	Implementation and verification of Decoder using logic gates.
14	Implementation and verification of De-multiplexer using logic gates
15	Implementation and verification of Encoder using logic gates.

16	Verification of state tables of RS,JK flip-flops using NAND & NOR gates.

Reference Book:

1. Donald P.Leach , Albert Paul Malvino, GoutamSaha, 2014. Digital Principles and Applications, 8th edition, Tata McGraw – Hill Publications, New Delhi.

References:

1. https://www.youtube.com/watch?v=763o4fK4TCk
2. https://www.youtube.com/watch?v=bQHwYmqUAqg

Course Designers:

1. S. Kumarappan, Assistant Professor of CA & IT
2. P. Praveena, Assistant Professor of CA & IT

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined B.Sc. IT on or after June 2023)

Programme Code - UIT

Course Code	Course Title	Category	L	T	P	Credit
UIT23SL21B	**Basics of Web Technology Lab**	SEC	0	0	2	2

L - Lecture   T - Tutorial   P – Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	II	25	75	100

Preamble

Make known to the basics of web development by using various tags, lists, Link, tables, frames,forms of HTML, CSS and Java Script.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcomes	Expected Proficiency	Expected Attainment
CO1	Describes the structure of html webpage and it's various tags for designing aweb page.	98%	92%
CO2	Discuss different types of list presentation.	96%	95%
CO3	Explain how to create Links to Navigate.	90%	88%
CO4	Explain how to create tabular presentation of data.	92%	90%
CO5	Project the usage of frames & forms in web page.	90%	88%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	L	S	L
CO2	S	M	M	M	M
CO3	S	L	L	L	L
CO4	M	L	M	L	L

CO5	**S**	**L**	**L**	**S**	**L**

Strong –S, Medium-M, Low-L

	PO1	PO2	PO3	PO4	PO5
CO1	S	L	L	L	L
CO2	S	M	M	M	M
CO3	M	L	M	M	M
CO4	S	L	M	L	L
CO5	M	S	S	L	M

Strong –S, Medium-M, Low-L

Blooms taxonomy: Assessment Pattern

	CA		End of
	First	**Second**	**Semester**
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Basics of Web Technology Lab

HTML:

Text Formatting:	1. Design a page having suitable background colour and text colour with title "My First Web Page"using all the attributes of the Font tag
	2. Create a HTML document giving details of your [Name, Age], [Address, Phone] and [RegisterNumber, Class] aligned in proper order using alignment attributes of Paragraph tag.
	3. Create a page to show different character formatting (B, I, U, SUB, SUP) tags.
	viz : $log_b m^p = p\,log_b m$
Image:	4. Create a web page with an appropriate image towards the left hand side of the page, when user clicks onthe image another web page should open.
Anchor:	5. Create web Page using Anchor tag with its attributes for external links.
Links:	6. Create a web page for internal links; when the user clicks on different links on the web page it shouldgo to the appropriate locations/sections in the same page.

Lists:

7. Write a HTML code to create a web page with pink color background and display moving message inred color.

8. Create a web page, showing an ordered list of all second semester courses.

9. Create a web page, showing an unordered list of science courses in our college.

Table:

10. Create the following HTML table with 5 rows & 5 columns with Dummy Data:

Frames:

11. Create a web page which divides the page in two equal frames and place the audio and video clips in frame-1 and frame-2 respectively.

12. Create a web page which should generate following output using frames:

FRAME-1	FRAME-2
	FRAME-3

Form:

13. Create a Html form which gets user name, pass word from the user.

CSS:

14. Using CSS set the text color to red, for elements.
15. Using CSS set the text color to red, for all <p> and <h1> elements. Group the selectors to minimize code.
16. Using CSS set the page's background color.
17. Using an inline style set the page's background color.
18. Using CSS set the height and Width of the <h1> element to "100px".

Java Script:

19. Create a html registration form and to validate the form using JavaScript code
20. Write down simple JavaScript using timeout such that image will be changed after every 1 ms at a specified position
21. Create an html page to change the background color for every click of a button using JavaScript.
22. Create an html page to explain the use of various predefined functions in a string and math object in java script.
23. Create simple JavaScript using timeout such that image will be changed after every 1 ms at a specified position

Reference Book:

1. Thomas Powell, 2017, HTML & CSS Complete Reference, Fifth Edition by MCGraw Hill Education, New Delhi

Web References:

1.. https://www.w3schools.com/html/
2. https://www.w3schools.com/js/
3. https://www.freecodecamp.org/news/html-css-and-javascript-explained-for-beginners/

Course Designers:

1. Mrs. P. Praveena, Assistant Professor of CA & IT
2. Mrs. M. Gayathiri, Assistant Professor of CA & IT

B.C.A.

Programme Code - UCA

Programme Outcome-PO (Aligned with Graduate Attributes)- Bachelor of Computer Application

PO 1 Knowledge

Able to understand and apply the fundamental principles, concepts and methods in diverse areas of computer applications, mathematics, statistics etc.,

PO 2 Problem analysis and Development of Solutions

Identify, formulate, research literature and analyze real- time problems. Attain substantiated conclusions to solve the problems using fundamental principles of mathematics, computing sciences by adopting various tools and techniques.

PO 3 Ethics and Social Responsibility

Understand and commit to professional ethics and cyber regulations, responsibilities and norms of professional computing practice.

PO 4 Communication and Team Building

Possess interpersonal skills and communicate effectively with the professionals and with society at large on system activities. Able to comprehend and write effective reports, design documentation, make effective presentations, and give/understand instructions.

PO 5 Life - long Learning

Recognize the need and have the ability, to engage in continuous reflective learning in the context of technological advancement. Create, select, adapt and apply appropriate techniques, resources, and computing tools to complex computing activities. Able to learn, adapt and apply emerging tools and technologies to meet the demand.

PO 6 Innovation, Employability and Entrepreneurial skills

Identify opportunity; pursue that opportunity to create value and wealth for the betterment of the individual and society at large. Develop the capacity to study and research independently that will help to develop skills for transition to employment in hardware/software companies.

THIAGARAJAR COLLEGE, MADURAI – 9.
(Re-Accredited with 'A++' Grade by NAAC)
Department of Computer Application and Information Technology

Vision

The Department of Computer Application & Information Technology foster competent and confident student community, enriched with soft skills inculcated with managerial skills and moralvalues.

Mission

- Empower groomed software professionals with robust knowledgebase
- Achieve employability in Information Technology and non Information Technology sector
- Develop potential individuals
- Promote students to become a successful entrepreneur.

Programme Educational Objectives (PEO)

The objectives of this programme is to equip/prepare the students to

PEO1	Equip the students to meet corporate needs.
PEO2	Professionally educate the students for pursuing higher education.
PEO3	Nurture the students with skills required to become an entrepreneur.
PEO4	Adapt the students with better learning ability in the ever changing software industry.
PEO5	Manage cross culture environment and have peer recognition.

Programme specific outcomes: BCA

On the successful completion of BCA the students will

PSO1	Illustrate the key concepts in Computer Applications.
PSO2	Analyze latest technologies and apply them to solve the issues in Computer Applications.
PSO3	Clarity on both conceptual and application oriented skills in computer technologies with quantitative and qualitative techniques.
PSO4	Build technical, professional, practical and communicative skills to face the industrial with clarity.
PSO5	Develop practical skills to provide solutions for computer oriented problems.

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DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined BCA on or after June 2023)- Programme Code-UCA

Semester – I

Course	Code No	Subject	Hrs/ Week	Cred.	Total Hrs	Max Mark CA	Max Marks SE	Total
Part - I	U23P1TA11B	Tamil	3	3	45	25	75	100
Part - II	U23P2EN11	English	4	3	60	25	75	100
Part - III	UCA23CT11	Programming in C	4	3	60	25	75	100
	UCA23CT12	Digital Principles and Computer Organization	4	3	60	25	75	100
	UCA23CL11	Programming in C Lab	4	2	60	25	75	100
	UMA23GT11S	**Generic Elective I (Options Given)**	5	3	75	25	75	100
Part - IV	UCA23NT11A	**NME – I (Options Given)**	2	2	30	25	75	100
	UCA23FT11	Problem Solving Techniques	2	2	30	25	75	100
	UCA23AT11	Logical Reasoning I	2	2	30	25	75	100
TOTAL		**Total**	**30**	**23**	**450**	**225**	**675**	**900**

Semester – II

Course	Code No	Subject	Hrs/ Week	Cred	Total Hrs	Max Mark CA	Max Marks SE	Total
Part - I	U23P1TA11B	Tamil	3	3	45	25	75	100
Part - II	U23P2EN11	English	4	3	60	25	75	100
Part – III	UCA23CT21	Java Programming	4	3	60	25	75	100
	UCA23CT22	Relational Database Management	4	3	60	25	75	100
	UCA23CL21	Java Lab	4	2	60	25	75	100
	UMA23GT21S	**Generic Elective II (Options Given)**	5	3	75	25	75	100
Part – IV	UCA23NT21B	**NME –II (Options Given)**	2	2	30	25	75	100
	UCA23SL21A	**SEC 1 (Options Given)**	2	2	30	25	75	100
	UCA23AT21	Logical Reasoning II	2	2	30	25	75	100
TOTAL			**30**	**23**	**450**	**225**	**675**	**900**
Extra Credit		**Naan Mudhalvan** Language Proficiency for Employability.		**02**				

(A) Consolidation of contact hours and credits: BCA

Semester	Contact Hrs/ Week	Credits
I	30 hrs	24
II	30 hrs	24
III	30 hrs	
IV	30 hrs	
V	30 hrs	
VI	30 hrs	
Part – V	-	01
Total	180 hrs	140
V	Additional credit (Naan Muthalvan)	2

A) Curriculum Credits: Part wise

		No of papers	Credits per paper	Total credits
Part I	Tamil	2	3	6
Part II	English	2	3	6
Part III	Core Theory	4	3	12
	Core lab	2	2	04
	Core Elective	0		
	Generic Elective Theory	2	4	08
Part IV	AECC	2	2	4
	NME	2	2	4
	SEC	1	2	2
	Foundation Course	1	2	2
Part V (NSS/NCC/Physical Education)				1
Grand total				48

Skill Based Electives

A) RDBMS Lab

B) WEB Technology

Non Major Electives - I

A) Cybercrime and Cyber Security

B) Intellectual Property Rights

Non Major Electives - II

A) Fundamentals of E-Commerce

B) PC Hardware and Trouble Shooting

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DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined BCA on or after June 2023)- Programme Code-UCA

Course Code	Course Title	Category	L	T	P	Credit
UCA23CT11	Programming in C	Core 2	**4**	**-**	**-**	**3**
	L - Lecture T - Tutorial P–Practical					

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	**I**	**25**	**75**	**100**

Preamble

C programming procure the core concepts in C language including control structures, arrays, structures, pointers and files.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Discuss the data types, character set, symbolic constant and storage Class	80%	75%
CO2	Apply control structures, branching, Conditional and looping statements	75%	68%
CO3	Demonstrate the features of arrays and string handling functions	80%	70%
CO4	Experiment with user defined functions and evaluate the various categoriesof functions with structures and union.	75%	68%
CO5	Make use of Pointers. Dynamic Memory Allocation and file management	80%	75%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S
CO2	S	S	S	M	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	M	M	S	S

S-Strong   M-Medium   L-Low

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	L	L	M	S	M
CO2	S	S	M	L	S	S
CO3	S	S	M	M	S	S
CO4	S	S	M	M	S	S
CO5	S	M	M	M	M	M

Blooms taxonomy: Assessment Pattern

| | CA | | End of |
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content- Programming in C

Unit-I   **12hours**

Overview of C: History of C - Importance of C - Sample Programs 1,2,3,4 and 5-Basic Structure of C Programs - Programming Style - Executing a „C" Program. Constants, Variables and Data types:Introduction-CharacterSet-CTokens-KeywordsandIdentifiers-Constants-Variables- Datatypes - Declaration of Variables - Declaration of Storage Class - Assigning Values to Variables - Defining Symbolic Constants - Declaring a Variable as constant-Declaring variable as Volatile. Operators and Expression.

Unit-II   **12hours**

Managing Input and Output Operations: Introduction - Reading a Character - Writing a Character-Formatted Input-Formatted Output. Decision Making and Branching: Introduction-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 go to Statement. Decision Making and Looping: Introduction- The while Statement-The do Statement-The for Statement-Jumps in Loops.

Unit-III   **12hours**

Array: Introduction - 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: Introduction - Declaring and Initializing String Variables - Reading Strings from Terminal - Writing Strings to Screen - Arithmetic Operation on Characters - Putting Strings Together – Comparison of Two Strings-String Handling Functions.

Unit-IV   **12hours**

User-Defined Functions: Introduction - Need for User Defined Functions - A Multi-Function Program - Elements of User-Defined Functions – Definition of functions- Returns Values and Their Types - Function Calls – Function Declaration - Category of Functions - No Arguments and No Return Values - Arguments but No Return Values - Argument with Return Values - No Argument but Returns a Value - Functions that Return Multiple Values - Nesting of Functions - Recursion- Passing Arrays to Functions - Searching and sorting-Passing Strings to Function - The Scope, Visibility and Lifetime of Variables. Structures and Union.

Unit-V   **12hours**

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- File Management in C.-Dynamic Memory Allocation and Linked List: Introduction - Dynamic Memory Allocation-Allocating a Block of Memory: malloc - Allocating Multiple Blocks of Memory: calloc, Releasing the Used Space: free, Altering the Size of a Block: realloc.

Text Books

1. Balagurusamy E, 2019, Programming in ANSI C, 8th edition, Tata McGraw – Hill Education Private Limited, New Delhi.

Unit	Chapters / Page Number
I	2, 3, 4
II	5, 6, 7
III	8, 9
IV	10,11
V	12(381-389), 13, 14 (445 – 452)

Reference Books

1. YashwantKanetkar, 2016. Let Us C, 14th edition, BPB Publications, NewDelhi.
2. Byron S. Gottfried, 2010. Programming with C, 3rd edition, Tata McGraw – Hill Publications, NewDelhi.
3. AnanthiSheshasaayee, 2009. Programming Language C with Practical, Margham Publication, Chennai.

Web Resources

1.http://people.scs.carleton.ca/~mjhinek/W13/COMP2401/notes/Arrays_and_Pointers.pdf
2.https://www.tutorialspoint.com/cprogramming/c_functions.htm

3. http://www.circuitstoday.com/control-structures-in-c-and-cpp

Course Designers

1. Dr. V. T.Meenatchi
2. Mrs. M.B.C Ashavani

Lecture Schedule		
Unit	**Topic**	**No.of Lecture Hrs**
I	**Overview of C**	**6**
1.1	History of C, Importance of C Basic Structure of C Programs, Character Set, C Tokens, Keywords and Identifiers, Constants, Variables	
1.2	Programming Style, Executing a C Program. Constants, Variables and Data types: Introduction	1
1.3	Datatypes, Declaration of Variable, Declaration of Storage Class , Assigning Values to Variables	1
1.4	Defining Symbolic Constants	1
1.5	Declaring a Variable as constant, Declaring variable as Volatile	1
1.6	Operators and Expression	2
II	**Managing Input and Output Operations:**.	**6**
2.1	Introduction - Reading a Character , Writing a Character, Formatted Input-Formatted Output. Decision Making and Branching	1
2.2	Decision making with if Statement , Simple if statement , The if….else Statement, Nesting of if…else Statements , The else if ladder	1
2.3	The Switch Statement, The ?: Operator , The go to Statement	1
2.4	Decision Making and Looping: The while Statement	1
2.5	The do Statement, The for Statement	1
2.6	Jumps in Loop	1
III	**Array**	**6**
3.1	One-dimensional Arrays , Declaration of One-dimensional Arrays , Initialization of One-dimensional Arrays	1
3.2	Two-dimensional Arrays , Initializing Two-dimensional Arrays -,Multi-dimensional Arrays , Dynamic Arrays..	1
3.3	Character Arrays and Strings: Introduction , Declaring and Initializing String Variables , Reading Strings from Terminal	2
3.4	Writing Strings to Screen , Arithmetic Operation on Characters ,Putting Strings Together	1
3.5	Comparison of Two Strings, String Handling Functions.	1
IV	**User-Defined Functions**	**6**
4.1	Need for User Defined Functions ,A Multi-Function Program Elements of User-Defined Functions , Definition of functions	1
4.2	Returns Values and Their Types Function Calls, Function Declaration, Category of Functions ,No Arguments and No Return Values	1
4.3	Arguments but No Return Values , Argument with Return Values , No Argument but Returns a Value -,Functions that Return Multiple Values , Nesting of Functions	1
4.4	Recursion, Passing Arrays to Functions-Passing Strings to Function	1
4.5	The Scope, Visibility and Lifetime of Variables.	1
4.6	Structures and Union.	1
V	**Pointers**	**6**
5.1	Introduction - Understanding Pointers ,Accessing the Address of a Variable , Declaring Pointer Variables , Initialization of Pointer Variables -	1
5.2	Accessing a Variable through its Pointer	1
5.3	Chainof Pointers.	1
5.4	Allocating a Block of Memory: malloc - Allocating Multiple Blocks of Memory: calloc,	1
5.5	Releasing theUsed Space: free, Altering the Size of a Block: realloc.	1
5.6	File Management in C.	1

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DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY
(For those joined BCA on or after June 2023)- Programme Code-UCA
Programme Code - UCA

Course Code	Course Title	Category	L	T	P	Credit
UCA23CT12	Digital Principles and Computer Organization	Core 1	4	-	-	3
	L - Lecture T - Tutorial P–Practical					

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	I	25	75	100

Preamble

Principles of digital design provides the basics of digital logic with universal gates , number system, data processing circuits like MUX, DMUX, arithmetic circuits, Flip-flops. In addition to it organization of computer offered the knowledge of memory system and arithmetic operations.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency (%)	Expected Attainment (%)
CO1	Identify the gates, Boolean laws and theorems, make use of K-Map.	80%	75%
CO2	Solve number system related problems and binary arithmetic.	85%	80%
CO3	Explain the function of data processing circuits, flip-flops	75%	60%
CO4	Discuss the computer types , bus structures, addressing modesand identify the procedure for an execution and Illustrate I/O device accessing , basic concepts of memories and its types	75%	70%
CO5	Discuss the concept of pipelining and embedded systems	80%	70%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	L	M
CO2	M	S	S	M	M
CO3	S	L	M	M	M
CO4	S	L	M	M	M
CO5	S	M	S	S	S

Strong –S   Medium-M   Low-L

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	L	M	L	M
CO2	S	S	L	M	M	L
CO3	S	M	L	M	M	M
CO4	M	M	L	L	M	M
CO5	S	S	L	M	M	M

Blooms taxonomy: Assessment Pattern

	CA		End of Semester
	First	Second	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content - Digital Principles and Computer Organization

Unit-I   12 hours

Digital Logic: The Basic Gates - Universal Logic Gates - AND-OR Invert Gates. **Combinational Logic Circuits:** Booleans Laws and Theorems - Sum-of-Products Method - Truth Table to Karnaugh Map - Pairs, Quads, and Octets - Karnaugh Simplifications – Don't care Conditions - Product of Sums Method - Product of sums Simplification.

Unit-II   10 hours

Number Systems and Codes: Binary Number System - Radix Representation of Numbers - Binary-to-decimal Conversion - Decimal-to- binary Conversion - Octal Numbers - Hexadecimal Numbers - The ASCII Code - The Excess-3 Code - The Gray Code. **Arithmetic Circuits:** Binary Addition - Binary Subtraction - Unsigned Binary Numbers- Sign-magnitude Numbers - 2''s Complement Representation - 2s Complement Arithmetic.

Unit-III   14 hours

Data processing circuits: Multiplexers – De-multiplexers - 1-of-16 Decoder - BCD-to- decimal Decoders - Seven-segment Decoders - Encoders - Exclusive-OR Gates - Parity Generators and Checkers. **Arithmetic Building Blocks** - The Adder – Subtracter. **FLIP-FLOPs:** RS FLIP-FLOPs - Edge- triggered RS FLIP-FLOPs - Edge-triggered D FLIP-FLOPs - Edge-triggered JK FLIP-FLOPs - JK Master-Slave FLIP-FLOPs.

Unit-IV   13 hours

Basic Structure of Computers: Computer Types - Functional Units - Basic Operational Concepts- Bus Structures - **Basic Processing Unit:** Some Fundamental Concepts - Execution of a Complete Instruction **Input / Output Organization:** Accessing I/O devices - Interrupts - Direct Memory Access. **The Memory System:** Some Basic concepts - Read-Only Memories- Speed, Size, and Cost - Cache Memories - Virtual memories.

Unit-V   11 hours

Pipelining: Basic Concepts - Data Hazards - Instruction Hazards. **Embedded Systems:** Examples of Embedded Systems - Processor Chips for Embedded Applications-A Simple Microcontroller.

Text Books

1. Donald P. Leach , Albert Paul Malvino, GoutamSaha, 2014, Digital Principles andApplications, 8th edition, Tata McGraw – Hill Publication, NewDelhi.
2. Carl Hamacher, ZvonkoVranesic, SafwatZaky, 2013, Computer Organization, 5th edition, Tata McGraw – Hill Publication, NewDelhi.

Unit	Chapters / Sections
I	Book 1: **2 (2.1 - 2.3), 3 (3.1-3.8),**
II	Book 1: **5 (5.1 - 5.3, 5.5-5.10), 6 (6.1-6.6),**
III	Book 1: **4 (4.1-4.8), 6 (6.7-6.8), 8 (8.1, 8.3-8.5, 8.8)**
IV	Book 2: **1 (1.1-1.4), 7 (7.1, 7.2), 4 (4.1 ,4.2, 4.4), 5 (5.1,5.3-5.5, 5.7)**
V	Book 2: **8 (8.1-8.3), 9 (9.1, 9.2,9.3)**

Reference Books

1. Morris Mano, 2012, Digital Logic & Computer Design, 5th edition, Prentice Hall of India publishing.
2. John D. Carpinelli, 2012, Computer System Organization and Architecture, Pearson Indian Education Service Private Limited,Chennai.
3. Morris Mano, 2011, Computer System Architecture, 4th edition, Prentice Hall of India publishing.

Web Resources

1.https://courses.cs.washington.edu/courses/cse370/08wi/pdfs/lectures/04-Logic%20gates.pdf
2.http://www.ee.ncu.edu.tw/~jfli/computer/lecture/ch05.pdf

3. http://www.pvpsiddhartha.ac.in/dep_it/lecturenotes/CSA/unit-4.pdf

Course Designers

1. Mrs.R.Umamaheswari
2. Dr. S.Abirami

Lecture Schedule

Sl. No.	Topic	No. of lecture hrs.
1	**Unit – I**	**12 Hrs**
1.1	**Digital Logic:** The Basic Gates - Universal Logic Gates - AND-OR Invert Gates.	4
1.2	**Combinational Logic Circuits:** Booleans Laws and Theorems - Sum-of-Products Method	4
1.3	Truth Table to Karnaugh Map - Pairs, Quads, and Octets - Karnaugh Simplifications – Don't care Conditions	4
1.4	Product of Sums Method - Product of sums Simplification	4
2	**Unit – II**	**10 Hrs**
2.1	**Number Systems and Codes:** Binary Number System - Radix Representation of Numbers - Binary-to-decimal Conversion - Decimal-to- binary Conversion - Octal Numbers - Hexadecimal Numbers	3

2.2	The ASCII Code - The Excess-3 Code - The Gray Code.	2
2.3	**Arithmetic Circuits:** Binary Addition - Binary Subtraction	3
2.4	Unsigned Binary Numbers- Sign-magnitude Numbers - 2"s Complement Representation - 2s Complement Arithmetic.	2
3	**Unit – III**	**14 Hrs**
3.1	**Data processing circuits:** Multiplexers – De multiplexers - 1-of-16 Decoder	3
3.2	BCD-to- decimal Decoders - Seven-segment Decoders - Encoders - Exclusive-OR Gates	4
3.3	Parity Generators and Checkers. **Arithmetic Building Blocks** - The Adder – Subtracter.	3
3.4	**FLIP-FLOPs:** RS FLIP-FLOPs - Edge- triggered RS FLIP-FLOPs - Edge-triggered D FLIP-FLOPs - Edge-triggered JK FLIP-FLOPs - JK Master-Slave FLIP-FLOPs.	4
4	**Unit – IV**	**13 Hrs**
4.1	**Basic Structure of Computers:** Computer Types - Functional Units - Basic Operational Concepts- Bus Structures	3
4.2	**Basic Processing Unit:** Some Fundamental Concepts - Execution of a Complete Instruction	3
4.3	**Input / Output Organization:** Accessing I/O devices - Interrupts - Direct Memory Access.	3
4.4	**The Memory System:** Some Basic concepts - Read-Only Memories- Speed, Size, and Cost - Cache Memories - Virtual memories.	4
5	**Unit – V**	**11 Hrs**
5.1	**Pipelining:** Basic Concepts - Data Hazards - Instruction Hazards.	4
5.2	**Embedded Systems:** Examples of Embedded Systems - Processor Chips for Embedded Applications	4
5.3	A Simple Microcontroller.	3
	Total	**60 Hrs**

Course Code	Course Title	Category	L	T	P	Credit
UCA23CL11	Programming in C Lab	Core Lab 1	**4**	**-**	**-**	**2**
	L - Lecture	T - Tutorial		P–Practical		

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	**I**	**25**	**75**	**100**

Preamble

Enable to identify and solve problems that require usage of Decision Making, Branching, Array, User-Defined Functions and pointers in C.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Write C programs for the designed algorithm with simple problems and control structures	80%	78%
CO2	Implement programs with homogeneous data structures and functions	75%	70%
CO3	Implement programs with heterogeneous data structures	80%	75%
CO4	Generate programs with file handling functions	72%	68%
CO5	Explore the concept of Pointers	75%	65%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S
CO2	S	S	S	M	M
CO3	S	S	S	M	S
CO4	S	M	M	S	L
CO5	M	M	M	S	S

S-Strong   M-Medium   L-Low

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	M	S	M
CO2	S	S	L	M	S	M
CO3	S	M	L	L	S	M
CO4	S	S	M	M	S	M
CO5	M	S	L	L	S	S

S-Strong   M-Medium   L-Low

Blooms taxonomy: Assessment Pattern

	CA		End of Semester
	First	**Second**	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content- Programming in C Lab

Simple Programs:

1. Finding the largest, smallest among three numbers
2. Finding the roots of a quadratic equation
3. Generate the Fibonacci sequence
4. Convert a decimal number to its binary equivalent

Control Structures:

1. Reverse a number
2. Find whether a number is prime or not
3. Find whether a given number is a perfect or not
4. Find the factorial of a number

Arrays:

1. Program for Sorting
2. Program to search an element
3. Find whether given string is a palindrome or not
4. Perform the addition of two matrices
5. Perform subtraction of two matrices
6. Perform multiplication of two matrices

Functions:

1. Program to apply Recursion
2. Program for Call by Value

Pointers:

1. Program to perform addition
2. Program for Call by Reference

Structures:

1. Program to print student information using structures
2. Program for Array of structures

File:

1. Program for applying File operations
2. Program to get n numbers and find odd and even numbers using file.

Web Resources

1. http://www.baburd.com.np/books/LabManual-ComputrProgramming.pdf2.http://www.sitttrkerala.ac.in/misc/LabManual/2139.pdf

Course Designers

1. Dr. V. T.Meenatchi
2. Mrs. M.B.C Ashavani

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Course Code	Course Title	Category	L	T	P	Credit
UCA23FT11	Problem Solving Techniques	Foundation Course	2	-	-	2

L - Lecture   T - Tutorial   P – Practicals

Year	Semester	Internal	External	Total
I	I	25	75	100

Preamble
This course facilitates to get in depth knowledge in programming for complicated logics.

Course Outcomes

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Problem Solving aspects, Strategies	66%	89%
CO2	Fundamental Algorithms for basic problems	97%	85%
CO3	Apply algorithm for factoring methods	90%	85%
CO4	Apply algorithm for array operations	90%	80%
CO5	Apply algorithm for complicated array operations	85%	75%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S
CO2	S	S	S	M	S
CO3	S	S	S	M	S
CO4	S	S	S	M	S
CO5	S	S	S	M	M

K1 – Knowledge   K2 – Understand   K3 – Apply

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	M	S	M
CO2	S	S	M	M	S	M
CO3	S	M	M	M	S	M
CO4	S	S	M	M	S	M
CO5	S	S	M	M	S	M

Blooms taxonomy: Assessment Pattern

	CA		End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content –Problem Solving Techniques

UNIT-I   5 hours

Introduction: Notion of algorithms and programs – Requirements for solving problems by computer – The problem-solving aspect: Problem definition phase, Getting started on a problem, The use of specific examples, Similarities among problems, Working backwards from the solution – General problem-solving strategies - Problem solving using top-down design – Implementation of algorithms – The concept of Recursion.

UNIT-II   6hours

Fundamental Algorithms: Exchanging the values of two variables – Counting - Summation of a set of numbers - Factorial computation - Sine function computation - Fibonacci Series generation - Reversing the digits of an integer – Base Conversion.

UNIT-III   7hours

Factoring Methods: Finding the square root of a number – The smallest divisor of an integer – Greatest common divisor of two integers - Generating prime numbers – Computing the prime factors of an integer – Generation of pseudo-random numbers

UNIT-IV   6 hours

Raising a number to a large power – Computing the nth Fibonacci number. **Array Techniques:** Array order reversal – Array counting or histogramming – Finding the maximum number in a set

UNIT-V   6 hours

Removal of duplicates from an ordered array - Partitioning an array – Finding the kth smallest element – Longest monotone subsequence.

Unit	Chapters/Sections
I	1
II	2
III	3.1-3.6
IV	3.7-3.8, 4.1-4.3
V	4.4- 4.7

Text Books:

R. G. Dromey, 2007, How to Solve it by Computer, Pearson India.

References:

Das, Sumitabha ,2021, Programming for Problem Solving with C, McGraw Hill

Dr. S. Anandamurugan, 2018, Programming for Problem Solving, KATSON

Nitin N. Sakhare , 2019, Programming And Problem Solving, Nirali Prakashan Publisher

Web Resources:

1.https://people.scs.carleton.ca/~lanthier/teaching/ProcessingNotes/COMP1405_Ch1_IntroductionToComputerScience.pdf

2.https://www.iitg.ac.in/asahu/cs101-2017/Lec10.pdf

Course Designers

1. Dr. S.Abirami
2. Mrs. M.B.C Ashavani

Sl. No.	Topic	No. of lecture hrs.
1	**UNIT-I**	**5 hours**
1.1	**Introduction**: Notion of algorithms and programs – Requirements for solving problems by computer	1
1.2	The problem-solving aspect: Problem definition phase, Getting started on a problem, The use of specific examples	1
1.3	Similarities among problems, Working backwards from the solution	1
1.4	General problem-solving strategies - Problem solving using top-down design	1
1.5	Implementation of algorithms – The concept of Recursion	1
2	**Unit – II**	**6 Hrs**
2.1	**Fundamental Algorithms:** Exchanging the values of two variables	2
2.2	Counting - Summation of a set of numbers - Factorial computation - Sine function computation	2
2.3	Fibonacci Series generation - Reversing the digits of an integer – Base Conversion	2
3	**Unit – III**	**7 Hrs**
3.1	**Factoring Methods:** Finding the square root of a number – The smallest divisor of an integer	2
3.2	Greatest common divisor of two integers - Generating prime numbers	2
3.3	Computing the prime factors of an integer – Generation of pseudo-random numbers	3
4	**Unit – IV**	**6 Hrs**
4.1	Raising a number to a large power – Computing the nth Fibonacci number.	3
4.2	**Array Techniques:** Array order reversal – Array counting or histogramming – Finding the maximum number in a set	3
5	**Unit – V**	**6 Hrs**
5.1	Removal of duplicates from an ordered array - Partitioning an array	3
5.2	Finding the kth smallest element – Longest monotone subsequence.	3
	Total	**30 Hrs**

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Course Code	Course Title	Category	L	T	P	Credit
UCA23AT11	Logical Reasoning I	**AECC**	**2**	**-**	**-**	**2**

L - Lecture   T - Tutorial   P – Practical

Year	Semester	Internal	External	Total
1	**I**	**25**	**75**	**100**

Preamble
Facilitates to solve various quantitative and aptitude problems, along with the verbal, non verbal reasoning and promotes in placement.

Course Outcome
On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Recall and apply Series completion, Number series, Alphabet series, Alpha numeric series, Continuous Pattern series.	76%	73%
CO2	Solve problems in Analogy, Completing the Analogous pair, Direct/Simple Analogy, Double Analogy.	76%	73%
CO3	Find the solution of Coding-Decoding : Letter coding, Direct letter coding, number/symbol coding and Substitution	72%	68%
CO4	Discuss various Bloodrelations ,Deciphering jumbled up descriptions, Relation puzzle and Direction sense Test	75%	73%
CO5	Explain the concept of Mathematical operations, Problem solving by substitution, Interchange of signs and Numbers	78%	76%

Mapping of COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M
CO2	M	M	M	M	L
CO3	L	L	M	S	M
CO4	S	M	S	M	S
CO5	S	S	S	S	S

S-Strong   M- Medium   L-Low

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M	M	M	S	S
CO2	S	L	L	L	M	L
CO3	S	M	L	M	M	M
CO4	S	M	M	S	S	S
CO5	S	S	M	M	S	S

Blooms taxonomy

| | CA | | End of |
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%
Total marks	52	52	140

Logical Reasoning I

Unit I: **6 hours**

Series: Series completion –Number series- Alphabet series-Alpha- numeric series- Continuous Pattern series.

Unit II: **6 hours**

Analogy: Completing the Analogous pair-Direct/Simple Analogy-Choosing the Analogous pair-Double Analogy-Choosing a similar word

Unit III: **6 hours**

Coding-Decoding : Letter coding-Direct letter coding – number/symbol coding –Substitution

Unit IV: **6 hours**

Bloodrelations: Deciphering jumbled up descriptions-Relation puzzle-Direction sense Test

Unit V: **6 hours**

Mathematical operations: Problem-solving by substitution-Interchange of signs and Numbers

Unit	Chapters/ Section
I	1(1.3-1.18)
II	2(2.6-2.52)
III	4(4.1-4.27)
IV	5(5.1-5.6) 8(8.1-8.19)
V	13(13.1-13.6)

Text Books:

Aggarwal R.S, 2021, A Modern Approach To Verbal & Non Verbal Reasoning , S. Chand & Company Pvt.Ltd, New Delhi.

References:

1. Abhijit Guha, 2014, Quantitative Aptitude for Competitive Examinations, 5th edition, Tata McGraw – Hill Publications, New Delhi.
2. Sijwali BS, Indu Sijwali, 2014, A New Approach to Reasoning Verbal & Non-Verbal Paperback , Arihant Publication

Web Resources:

1. www.careerbless.com
2. https://www.indiabix.com/aptitude/profit-and-loss/
3. https://www.handakafunda.com/pipes-and-cisterns-concepts-properties-and-cat-questions/

Course Designers:

1. Mrs. M.B.C.Ashavani
2. Mrs. P.Praveena

Lecture Schedule

	Topic	No.of Lecture hrs
1.1	**Series:** Series compilation – Number series.	3
1.2	Alpha numeric series-Continuous pattern series.	3
2.1	**Analogy** – Direct/simple analogy	3
2.2	Choosing the Analogous pair-Double Analogy-Choosing a similar word	3
3.1	**Coding-Decoding** :Letter coding-Direct letter coding	3
3.2	number/symbol coding-Substitution	3
4.1	**Blood relations** – Jumbled up descriptions.	3
4.2	Relation puzzle-Direction sense Test.	3
5.1	**Mathematical operations:** Problem-solving by substitution	3
5.2	Interchange of signs and Numbers	3
Total(6+6+6+6+6)		30

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Course Code	Course Title	Category	L	T	P	Credit
UCA23CT21	Java Programming	Core 3	4	-	-	3
	L - Lecture T - Tutorial P–Practical					
Year	**Semester**	**Max. Marks CA**	**Max. Marks SE**	**Total**		
I	**II**	25	75	100		

Preamble

Describes the features of Oops with java application, Swing, GUI programme and inculcate theability to develop projects in java

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Identify the importance of java with its data types, control statements and class fundamentals.	85%	85%
CO2	Make use of inheritance, method overriding and implementing inheritance concept & its problems	85%	80%
CO3	Experiment with user defined packages with multiple classes & Interfaces , exception handling mechanisms	80%	78%
CO4	Apply and multithreading, string and string buffer handling functions and analyze the concept of Stream.	75%	72%
CO5	Build Swing programming using awt controls through Event Handling	70%	65%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M
CO2	S	S	M	M	M
CO3	S	M	L	L	M
CO4	S	M	M	S	L
CO5	S	L	L	L	M

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	S	S	M
CO2	S	S	S	M	S	S
CO3	S	S	S	S	S	M
CO4	S	S	S	S	S	S
CO5	S	M	M	S	S	S

Blooms taxonomy: Assessment Pattern

	CA		End of Semester
	First	Second	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content- Java Programing

Unit-I   12hours

The Genesis of Java: Java"s Lineage- The creation of java- Why Java is important to internet-Java"s Magic: The Byte code-The Java buzzwords. An Over View Of Java- Data types, Variables and Arrays. Operators. Control statements. **Introducing classes:** Class Fundamentals-Declaring objects-Assigning object reference variables- Introducing Methods-.Constructors-The this Keyword-Garbage Collection- finalize() Method.

Unit-II   12hours

Inheritance :Inheritance Basics- Using super-Creating a multilevel Hierarchy-When constructors are called--Method overriding-Dynamic method dispatch-Using Abstract classes-using final with inheritance-The Object class. **Packages and Interfaces:** Packages- Access protection- Importing packages-interfaces.

Unit –III   12hours

Exception Handling: Exception Handling Fundamentals- Exception types-Uncaught Exceptions-using try and catch-user – Multiple catch Clauses-Nested try Statements-throw-throws- finally-Java"s built in exceptions-Creating your own exception subclasses. **String handling:** String constructor- Special String operations-character extraction-String comparison-Searching Strings-modifying a String-Date conversion using value Of( )-String Buffer.

Unit-IV   12hours

Multithreaded Programming: The Java Thread Model-main thread-creating a Thread-Creating multiple threads- Using is Alive( ) and join( )-Thread priorities- Thread Synchronization. **Input/Output**: Exploring java.io: File-Directory- Stream Classes-File-The Stream Classes-The Byte Streams-Input Stream-File Output Stream- File input Stream –File Output Stream.

Unit-V   12hours

Introducing the AWT: AWT Classes- Window Fundamentals- **Event Handling**-The Delegation Event Model-Event Classes- The action event class- The Adjustment Event Class-The Item Event Class.-Event Listener Interface – Action Listener-Adjustment Listener Interface-Item Listener Interface-**Using AWT Controls-**Using Buttons- Check Box- Managing Scrollbars- Using Text Filed. **Exploring Swing-** JTextField- JButton- JList- JCombobox.

Text Books

1 . Herbert Schildt, 2021, Java 2: The Complete Reference 12th edition, Tata McGraw Hill Education Private Limited.

UNIT	Chapter /Sections
I	1,2,3,4,5,6
II	8,9
III	10,18
IV	11 (Pg. 247-263) , 22 (Pg. 715-720, 722-727)
V	26 (851-855) , 25(Pg. 820-824, 827, 833-834) , 27 (883, 887, 897,900) , 33(1081-1083, 1096-1099)

Reference Books

- Adan Dodson, 2020, Java: Java programming for Beginners Teaching You Basic to Advance Java Programming Skills, Create space Independent Publishing Platform.
- Balagurusamy, 2019, programming with Java, 6th edition, Tata McGraw Hill EducationPrivate Limited.
- Yashwant Kanetkar, 2019, Let Us Java 5th edition, BPB publications.

Web Resources

1. https://www.javatpoint.com/exception-handling-in-java
2. https://www.edureka.co/blog/java-string/
3. http://www2.gsu.edu/~matpxp/SwIG/talks/java_applets.pdf

Course Designers

1. Dr. S.Abirami
2. Dr. V.T Meenatchi

Lecture Schedule

Sl. No.	Topic	No. of lecture hrs.
1	**UNIT-I**	12 hours
1.1	**The Genesis of Java**: Java"s Lineage- The creation of java Why Java is important to internet- Java"s Magic: The Byte code	3
1.2	The Java buzzwords. An Over View Of Java- Data types, Variables and Arrays. Operators. Control statements.	3
1.3	**Introducing classes:** Class Fundamentals-Declaring objects-Assigning object reference variables-	3
	Introducing Methods-.Constructors-The this Keyword-Garbage Collection-finalize() Method.	3
2	**Unit – II**	12 Hrs
2.1	**Inheritance** :Inheritance Basics- Using super-Creating a multilevel Hierarchy	3
2.2	When constructors are called--Method overriding-Dynamic method dispatch	3
2.3	Using Abstract classes-usingfinal with inheritance-The Object class.	3
	Packages and Interfaces: Packages- Access protection- Importing packages-interfaces.	3
3	**Unit – III**	12 Hrs
3.1	**Exception Handling:** Exception Handling Fundamentals-Exception types-Uncaught Exceptions-using try andcatch.	4
3.2	user – Multiple catch Clauses-Nested try Statements-throw-throws- finally-Java"s built in exceptions-Creating your own exception subclasses.	3
3.3	**String handling:** String constructor- Special String operations-character extraction-String comparison	3
	Searching Strings-modifying a String-Date conversion using value Of( )-String Buffer	2
4	**Unit – IV**	12 Hrs
4.1	**Multithreaded Programming:** The Java Thread Model-main thread-creating a Thread-Creating multiple threads	3
4.2	Using is Alive( ) and join( )-Thread priorities- Thread Synchronization.	3
	Input/Output: Exploring java.io: File-Directory- Stream Classes-File-The Stream Classes-The Byte Streams	3
	Input Stream-File Output Stream- File input Stream –File Output Stream.	3
5	**Unit – V**	12 Hrs
5.1	**Introducing the AWT:** AWT Classes- Window Fundamentals	1
5.2	**Event Handling**-The Delegation Event Model-Event Classes- The action event class- The Adjustment Event Class-The Item Event Class.	4
5.3	Event Listener Interface – Action Listener-Adjustment Listener Interface-Item Listener Interface	**3**
5.4	**Using AWT Controls-**Using Buttons- Check Box- Managing Scrollbars- Using Text Filed. **Exploring Swing-** JTextField- JButton- JList- JCombobox.	**4**
	Total	**60 Hrs**

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Course Code	Course Title	Category	L	T	P	Credit
UCA23CT22	Relational Database Management System	Core 4	4	-	-	3
	L - Lecture T - Tutorial P–Practical					

Year	Semester	Max. Marks CA	Max. Marks SE	Total	
I	II	25	75	100	

Preamble

Walk through the basics of database concepts, data models, relational database design, transaction management, database system architectures, storage methods, querying and managing databases by using sql commands.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency (%)	Expected Attainment (%)
CO1	Outline and Elaborate the database concepts, Relational data model, database design and normalization	73%	70%
CO2	Infer and Apply the DDL commands in Manipulating schema of table. Understand and implement DML commands,	72%	70%
CO3	Depict the concepts of Function, join and views.	70%	69%
CO4	Interpret Sub Queries and implement the PL/SQL Structure and using control structures for data manipulation and Triggers.	68%	68%
CO5	Illustrate and Apply Cursor, Function, Procedures for database and Packages.	70%	60%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	S
CO2	M	S	L	M	S
CO3	M	S	M	M	M
CO4	S	M	S	S	M
CO5	S	M	S	S	S

S-Strong   M-Medium   L-Low

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	L	L	M	M
CO2	S	S	L	L	S	M
CO3	S	L	M	M	M	S
CO4	S	L	M	M	M	S
CO5	S	S	L	M	M	S

Blooms taxonomy: Assessment Pattern

	CA		End of Semester
	First	Second	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content- Relational Database Management System

Unit - I   **12 Hours**

Introduction – Database System Applications – Purpose of Database Systems- View of Data- Database Languages- Database Architecture- Database Schema- Keys-Relational operations- Database Design- Overview of the Design Process- The E-R model-E-R diagrams. **Relational Database Design:** Features of Good Relational Designs - Atomic Domains and First Normal Form – 2NF-3NF-BCNF-4NFand 5NF

Unit – II   **13 Hours**

Structured Query Language (SQL): Overview of SQL- Data Definition- Data Manipulation and Transactions- Retrieval- Security – Privileges and Roles- Grant and Revoke -- DDL - Naming rules and conventions – Data types- Constraints- Creating a table- Displaying table information - Altering an existing table - Dropping, renaming and truncating table - **Working with tables**: DML - Adding a new Row/Record - Updating and deleting an existing rows/records - Retrieving data from table- Arithmetic operations - Restricting data with WHERE clause- Sorting

Unit – III   **12 Hours**

Views: Views - Creating a view - Removing a view - Altering a view- **Functions**: Overview of functions – Arithmetic Functions – Text Functions – Date Functions – Group Functions- Creating other Database Objects-(Sequences, Indexes and Synonyms)-**Joins:** Equijoins-Non-Equijoin-Outer join –Set Operators

Unit - IV   **12 Hours**

Sub Queries: Any, All, Exists **- An Introduction to PL/SQL:** PL/SQL overview- Declaration Section-Executable Commands Section- Conditional logic- Loops- CASE Statements- Exception handling Section- Triggers.

Unit - V   **10 Hours**

PL/SQL Cursors, Procedures, Functions and Packages: Cursors - Implicit & explicit cursors - Procedures – Functions- Packages.

Text Books

1. Abraham Silberschatz, Henry Korth, S.Sudarshan, 2013, Database System Concepts, 6th edition, McGraw Hill Education Private Limited, NewDelhi.
2. Lex de Haan, Daniel Fink, Tim Gorman, Inger Jørgensen, Karen Morton, 2011,Beginning Oracle SQL ,1st edition, Apress.
3. Bob Bryla, Kevin Loney, 2014, Oracle Database 12c: The Complete Reference, McGraw Hill Education Private Limited, New York (https://www.amazon.com/Oracle-Database- 12c-Complete-Reference-ebook/dp/BOODQSTPUE).

Unit	Chapters/ Section
I	**Book1-Chap-1 (1.1-1.4,1.9,1.12)Chap-2 (2.1-2.4,2.6),Chap-7(7.1-7.3,7.5), Chap-8 (8.1-8.4, 8.6)**
II	**Book2- Chap-2(2.1,2.2), Chap-3, Chap-4(4.1-4.6)**
III	**Book2- Chap-10, Chap-5 (5.1-5.3, 5.5,5.7), Chap-7(7.5,7.7,7.8), Chap-8(8.2-8.4,8.6,8.10)**
IV	**Book3-Chap-9(9.1), Chap-32, Chap-34**
V	**Book3-Chap-35, Chap-36(Page No- 627-630)**

Reference Books

1. RamezElmasri, Shamkant B. Navathe, 2013, Database Systems Models, Languages, Design and Application Programming, 6th edition, PearsonEducation.
2. Date C.J, Kannan.A, Swamynathan.S, 2013, Introduction to Database Systems, 8th edition, , PearsonEducation.
3. Rajesh Narang, 2011, Database Management System, 2nd edition, PHI Learning Private Limited, New Delhi

Web Resources

1. https://www.tutorialspoint.com/dbms/
2. https://cs.uwaterloo.ca/~tozsu/courses/CS338/lectures/14%20DB%20System.pdf

3. https://docs.oracle.com/cd/B19306_01/server.102/b14357/qstart.htm

Course Designers

1. Mrs. R.Umamaheswari
2. Dr. V.T Meenatchi

Sl. No.	Topic	No. of lecture hrs.
1	**Unit – I**	**12 Hrs**
1.1	**Introduction –** Database System Applications – Purpose of Database Systems- View of Data-Database Languages	3
1.2	Database Architecture- Database Schema- Keys-Relational operations- Database Design	2
1.3	Overview of the Design Process- The E-R model-E-R diagrams.	2
1.4	**Relational Database Design:** Features of Good Relational Designs - Atomic Domains and First Normal Form – 2NF-3NF-BCNF-4NFand 5NF	5
2	**Unit – II**	**13 Hrs**
2.1	**Structured Query Language (SQL):** Overview of SQL- Data Definition- Data Manipulation and Transactions- Retrieval- Security – Privileges and Roles- Grant and Revoke	3
2.2	DDL - Naming rules and conventions – Data types- Constraints- Creating a table- Displaying table information - Altering an existing table - Dropping, renaming and truncating table	4
2.3	**Working with tables**: DML - Adding a new Row/Record - Updating and deleting an existing rows/records	3
2.4	Retrieving data from table- Arithmetic operations - Restricting data with WHERE clause- Sorting	3
3	**Unit – III**	**12 Hrs**
3.1	**Views:** Views - Creating a view - Removing a view - Altering a view	2
3.2	**Functions**: Overview of functions – Arithmetic Functions – Text Functions – Date Functions- Group Functions	4
3.3	Creating other Database Objects-(Sequences, Indexes and Synonyms)	3
3.4	**Joins:** Equijoins-Non-Equijoin-Outer join–Set Operators	3
4	**Unit – IV**	**12 Hrs**
4.1	**Sub Queries:** Any, All, Exists	2
4.2	**An Introduction to PL/SQL:** PL/SQL overview- Declaration Section- Executable Commands Section	4
4.3	Conditional logic- Loops- CASE Statements	4
4.4	Exception handling Section- Triggers.	2
5	**Unit – V**	**11 Hrs**
5.1	**PL/SQL Cursors -** Implicit & explicit cursors	4
5.2	**PL/SQL Procedures, Functions**	4
5.3	Packages.	3
	Total	**60 Hrs**

Course Code	Course Title	Category	L	T	P	Credit
UCA23CL21	Java Lab	Core Lab2	-	-	4	2

L - Lecture   T - Tutorial   P–Practical

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	II	25	75	100

Preamble

Provides insight into java through the core concepts and window programming

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Develop simple java programs using control structures and arrays	80%	75%
CO2	Write java code using Package, Thread and Exceptions	75%	70%
CO3	Implement java programs through object oriented programming concepts	75%	70%
CO4	Apply AWT to develop window based applications	75%	68%
CO5	Develop Swing based applications	70%	65%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	L
CO2	S	S	S	S	M
CO3	S	S	S	S	M
CO4	M	M	M	M	S
CO5	S	M	S	S	S

Strong –S   Medium-M   Low-L

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	S	S	M
CO2	S	S	S	M	S	S
CO3	S	S	S	S	S	M
CO4	S	S	S	S	S	S
CO5	S	S	M	M	S	S

Blooms taxonomy: Assessment Pattern

	CA		End of
	First	**Second**	**Semester**
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content- Java Lab

Simple Programs

- Write a java program for printing multiplication table in reverse.
- Write a java program for finding the given number is in Fibonacci series or not.
- Write a java program for finding the highest prime number with in N
- Write a java program for finding List of Factorial.
- Write a java program for finding the given number is palindrome or not.
- Write a Java Program for : 1+3/3! +5/5!
- Write a java program for printing the given number in expanded form.
- Write a java program for validating the date of birth.
- Write a java program for printing a patterns

Class & Object , Inheritance, Polymorphism

- Write a Java Program for calculating student's grade
- Write a java program for calculating grocery billing process using inheritance.
- Write a java program for Employee pay bill process.
- Write a java program for finding volume of different shapes using functional polymorphism.
- Write a Java Program for the demo of Custom Exception

String

- Write a java program for counting number of words
- Write a java program for printing String in sentence case.
- Write a java program for counting words starts with Vowels
- Write a java program for listing the strings starts with letter: 'M'

Recursion

- Write a java program for reversing a number using recursion
- Binary to Gray code using recursion
- Function to copy the string

Package, Thread

- Write a java program for creating user defined package.

- Write a java Multithreaded program

Swing

- Write a java Swing program for graphics functions

- Write a java program for Swing life cycle

- Write a java Swing program for UI Event Handling

Java Lab- Web Resources

1. http://www.atri.edu.in/images/pdf/departments/JAVA%20PROGRAMMING%20%20MANUAL.pdf2.http://jnec.org/Lab-manuals/CSE/CSE1/TE-Part-1/Java-LM-SSD-March.pdf

Course Designers:

1. Dr. S.Abirami
2. Mrs. MBC. Ashavani

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Course Code	Course Title	Category	L	T	P	Credit
UCA23AT21	**Logical Reasoning II**	AECC	2	0	0	2

L - Lecture   T - Tutorial   P - Practical

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	II	25	75	100

Preamble

Provoke knowledge to solve logical Reasoning problems and formulate to compete competitive exams for higher education and placement.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Discuss arithmetic reasoning on age, venn-diagram	96%	89%
CO2	Discourse how to find out Missing Character in a series of characters, Explains how to Reaction for a Situation	97%	85%
CO3	Deliberate about statement it's assumptions, arguments and conclusions	98%	88%
CO4	Illuminate how to derive conclusions from passage.	96%	80%
CO5	Analysis of reasoning, Problems on dice.	95%	90%

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	S
CO2	S	M	S	M	M
CO3	M	M	S	M	M
CO4	S	M	S	M	S
CO5	M	S	S	S	S

(S – Strong , M – Medium , L – Low)

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	M	M	M
CO2	S	S	M	M	M	M
CO3	M	M	S	S	S	S
CO4	S	M	L	M	M	M
CO5	S	M	S	M	M	M

Blooms taxonomy

	CA		End of Semester
	First	**Second**	
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Total marks	52	52	140

Logical Reasoning II

Unit I :   **6 hours**
      Arithmetic Reasoning: Type1: Calculation Based Problems Type2: Data Based Questions Type3: Problems on Age. Type4: Venn–Diagram Based Questions.

Unit II :   **6 hours**
      Inserting the Missing Character – Data Sufficiency – Assertion and Reason – Situation
      Reaction Test – Verification of Truth of the Statement.

Unit III :   **6 hours**
      Logical Deduction: Logic: Type 1: Two Premise Arguments. Type2: Three Premise Arguments.
Statement-Argument. - **Statement-Assumptions** – Type1. **Statement-Conclusions** – Type1.

Unit IV: **6 hours**
      Deriving Conclusions From Passages – Theme Detection – Cause and Effect Reasoning.
Series: PART II: NON VERBAL REASONING Type1:Five Figure Series. – Type2:Three and
Four Figure Series.

Unit V :   **6 hours**
      Type3: Choosing missing Figure in a Series. **Analogy:** Type 1: Choosing one element of a Similarly
      Related Pair. **Analytical Reasoning** - Problems on Dice.

Text Books:
1. Dr. R.S. Aggarwal "A Modern Approach to Verbal & Non- Verbal Reasoning", Reprint 2021, S. Chand & company Ltd.

Unit	Chapters(pages)
I	15.1 to 15.7
II	16.1 to 16.4, 17.1 to 17.3, 19.1 to 19.4, 20.1 to 20.3 21.1 to 21.2
III	Section II 1.1 to 1.10, 1.11, 1.17, 1.19.1.34 2.1 to 2.3 3.1 to 3.3 5.1 to 5.3

IV	6.1 to 6.3 7.1 to 7.3 8.1 to 8.3 PART II: NON VERBAL REASONING 1.1 to 1.6, 1.91 to 1.94	
V	2.1 to 2.3 4.1 to 4.5 14.29 to 14.31	

eferences:

1. Aruna Sharma, "How to prepare for Logical Reasoning for CAT", 5thEdition,MCGrawHill.

Web Resources:

https://www.tutorialspoint.com/reasoning/index.htm
https://www.javatpoint.com/reasoning

Course Designers:

1. Mrs. P. Praveena
2. Mrs. M.B.C.Ashavani

Lecture Schedule

Chapter/ Section	Topic	Lecture hours
1.1	**Arithmetic Reasoning:** Type1: Calculation Based Problems Type2: Data Based Questions	3
1.2	Type3: Problems on Age. Type4: Venn–Diagram Based Questions.	3
2.1	Inserting the Missing Character – Data Sufficiency – Assertion and Reason –	2
2.2	Situation Reaction Test – Verification of Truth of the Statement.	3
3.1	**Logical Deduction: Logic:** Type 1: Two Premise Arguments. Type2: Three Premise Arguments.	4
3.2	**Statement-Argument**. - **Statement-Assumptions** – Type1. **Statement-Conclusions** – Type1.	3
4.1	**Deriving Conclusions From Passages – Theme Detection – Cause and Effect Reasoning.**	4
4.2	**PART II: NON VERBAL REASONINGSeries:**Type1: Five Figure Series. – Type2: Three and Four Figure Series.	3
5.1	Type3: Choosing missing Figure in a Series. **Analogy:** Type 1: Choosing one element of a Similarly Related Pair.	3
5.2	**Analytical Reasoning** - Problems on Dice.	2
	Total Hours	**30**

SBE-Skill Based Electives

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Course Code	Course Title	Category	L	T	P	Credit
UCA23SL21A	RDBMS Lab	Skill Based Elective	-	-	2	2

L - Lecture	T - Tutorial	P–Practical

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	**II**	**25**	**75**	**100**

Preamble

Develop practical skills on SQL and PL/SQL

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Create tables and implement DDL and DML commands	80%	75%
CO2	Restricting data with WHERE clause- Sorting and Exception	70%	65%
CO3	Demonstrate the concept of Views, Functions and Joins	75%	70%
CO4	Apply the concept of Sub Queries, Conditional Logic and Triggers.	70%	65%
CO5	Implement the concept of cursors, procedures and packages	75%	60%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	M	S	S	M
CO4	S	M	L	M	S
CO5	S	M	M	S	S

S-Strong   **M-Medium**   **L-Low**

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	L	L	S	S
CO2	S	S	M	M	S	S
CO3	S	S	S	M	S	S
CO4	S	S	L	M	M	S
CO5	S	S	M	M	L	S

Blooms taxonomy: Assessment Pattern

	CA		End of Semester
	First	**Second**	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content- RDBMS Lab

SQL

1. Queries on Student table
2. Queries on Employee table
3. Queries on Hospital table
4. Queries on Sports table
5. Queries on Export table
6. Queries on Arithmetic, Date and Group function
7. Join Queries
8. Sub queries
9. Implementation of Normalization

PL/SQL

1. PL/SQL block to find factorial of a given number
2. PL/SQL block to generate Fibonacci series
3. PL / SQL block using Cursors
4. PL / SQL block using Exception handling
5. PL / SQL block using Triggers
6. PL / SQL block using Packages
7. PL / SQL block using Function
8. PL / SQL block using Procedures

Web Resources

1. http://www.srmuniv.ac.in/sites/default/files/2017/cse-lab-manual-dbms.pdf
2. 2.http://jnec.org/Lab-manuals/CSE/CSE1/TE-Part-1/DBMS-LM-Varsha.pdf

Course Designers

1. Mrs. R.Umamaheswari
2. Dr. S.Abirami

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Course Code	Course Title	Category	L	T	P	Credit
UCA23ST21B	Web Technology	Skill Based Elective	2	-	-	2

L–Lecture   T–Tutorial   P–Practical

Year	Semester	Internal	External	Total
I	II	25	75	100

Preamble

This course provides knowledge about web designing tools like HTML, javascript and PHP.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Discuss the introduction of HTML document structure, java script and VBScript.	80%	75%
CO2	Illustrate features of PHP, XHTML, advantages of PHP over other scripting languages, running a PHP script.	75%	68%
CO3	Describe the user defined function in PHP, types of arrays, traversing arrays using Loops	70%	70%
CO4	Make Use of Relational Databases, SQL, PHP/MySQL Functions and Creating MySQL Databases with PHP	70%	68%
CO5	Examine HTML and database tables, building forms from queries, basic form Submission to aDatabase and editing data with an HTML form.	70%	65%

Mapping of COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M
CO2	S	S	S	S	M
CO3	S	S	S	S	M
CO4	S	S	S	S	M
CO5	S	S	S	S	M

S-Strong   M-Medium   L-Low

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M	L	L	S	S
CO2	S	M	L	M	M	S
CO3	S	M	M	M	S	M
CO4	S	S	L	S	S	S
CO5	S	S	M	S	S	S

Blooms Taxonomy

	CA		End of Semester
	First	Second	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Content

Unit-I: **3 hours**

HTML and JavaScript Programming: HTML–Introducing HTML document structure–Creating headings on a webpage–Working with links–Creating a paragraph–Working with images–Working with tables–Working with frames–Introduction to forms & HTML controls– Introducing-Cascading Style Sheets–Inline styles–External style sheets–Internal styles–Style classes–Multiple styles

Unit-II: **3 hours**

Introducing DHTML–Introducing JavaScript– Client side benefits of using JavaScript over VBScript–Embedding JavaScript in an HTML page–Handling events–Using variables in JavaScript–Using array in JavaScript– Creating objects in JavaScript– Using Operators–Working With control flow statements–Working with functions.

Unit-III: **4 hours**

Introducing PHP: Versions of PHP– Features of PHP– Introduction to HTML and XHTML–Advantages of PHP over other scripting languages– Creating a PHP script–Running a PHP script–Handling errors in a PHP script– Escape characters. Working With Variables and Constants: Using variables–Using constants– Exploring Data types in PHP–Exploring operators in PHP. Controlling Program Flow: Conditional statements–Looping statements–Break, Continue and Exit statements.

Unit-IV: **10 hours**

Introduction to SQL: Relational Databases and SQL–SQL Standards–The Work horses of SQL– Select–Insert–Update–Delete–Database Design–Privileges and Security. PHP/MySQL   Functions – Connecting to MySQL – Making MySQL Queries – Fetching Data Sets – Getting Data about Data–Multiple Connections–Building in Error Checking–Creating MySQL Databases with PHP–MySQL data types– MySQL Functions.

Unit-V: **10 hours**

Displaying Queries in Tables: HTML Tables and Database Tables– One-to-one mapping –Example: A single-table displayer–The sample tables–Improving the displayer– Complex Mappings –Multiple queries versus complex printing– A multiple-query example –A complex printing example–Creating the Sample Tables. Building Forms from Queries : HTML Forms– Basic Form Submission to a Database– Self-Submission–Editing Data with an HTML Form.

Unit	Chapters/Sections
I	Book1:2 (Pg. 40-105)
II	Book1:2 (Pg. 107-143)
III	Book1: 3,4,5
IV	Book2:13,15
V	Book2:16,17

Text Books:

1. Web Technologies Black Book, 2018,First Edition, Tata McGraw –Dream Tech Press, New Delhi.
2. Tim Converse and Joyce Park with Clark Morgan, 2017, PHP5 and
MYSQL, Bible, Wiley Publishing Inc, Indiana.

References:

1. StevenHolzner,2016(21stReprint),The Complete reference PHP complete
reference, Tata McGraw– Hill Education Private Limited, New Delhi.
2. by Laura Lemay,Rafe Colburn, Jennifer Kyrnin , 2016, MASTERING HTML,
CSS & Java Script Web Publishing
3. Xavier C., 2022, Second Edition, Web Technology and Design, New Age
International Private Limited, Publishers, New Delhi.

Web Resources:

1. https://www.tutorialspoint.com/html/
2.https://www.siteground.com/tutorials/phpmysql/3.https://www.quackit.com/css/

Course Designers

1. Dr. S. Abirami
2. Dr. V.T.Meenatchi

Lecture Schedule		
S l. No.	**Topic**	**No.of lecture hrs.**
1	**UNIT-I**	3 hours
1.1	**HTML and JavaScript Programming:** HTML- Introducing HTML document structure–Creating headings on a webpage–Working with links	1
1.2	Creating a paragraph– Working with images–Working with tables–Working with frames–Introduction to forms & HTML controls	1
1.3	Introducing-Cascading Style Sheets–Inline styles–External style sheets– Internal styles–Style classes–Multiple styles	1
2	**Unit – II**	3 hrs
2.1	Introducing DHTML–Introducing JavaScript– Client side benefits of using JavaScript over VBScript	1
2.2	Embedding JavaScript in an HTML page–Handling events–Using variables in JavaScript–Using array in JavaScript–	1
2.3	Creating objects in JavaScript– Using Operators–Working With control flow statements–Working with functions.	1
3	**Unit – III**	4 hrs
3.1	**Introducing PHP:** Versions of PHP– Features of PHP– Introduction to HTML and XHTML–Advantages of PHP over other scripting languages– Creating a PHP script– Running a PHP script–Handling errors in a PHP script	2
3.2	Escape characters. Working With Variables and Constants: Using variables–Using constants– Exploring Data types in PHP	1
3.3	Exploring operators in PHP. Controlling Program Flow: Conditional statements–Looping statements–Break, Continue and Exit statements	1
4	**Unit – IV**	10 hrs
4.1	**Introduction to SQL:** Relational Databases and SQL– SQL Standards–The Work horses of SQL– Select–Insert–Update–Delete.	2
4.2	Database Design–Privileges and Security. PHP/MySQL Functions – Connecting to MySQL – Making MySQL Queries	2
	Fetching Data Sets – Getting Data about Data–Multiple Connections– Building in Error Checking	3
	Creating MySQL Databases with PHP–MySQL data types– MySQL Functions	3
5	**Unit – V**	10 hrs
5.1	**Displaying Queries in Tables:** HTML Tables and Database Tables– One-to-one mapping –Example: A single-table displayer	2
5.2	The sample tables–Improving the displayer– Complex Mappings	2
5.3	Multiple queries versus complex printing– A multiple-query example-A complex printing example–Creating the Sample Tables.	**3**
5.4	Building Forms from Queries : HTML Forms– Basic Form Submission to a Database– Self-Submission–Editing Data with an HTML Form	**3**
	Total	**30 hrs**

NME-Non Major Electives

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Course Code	Course Title	Category	L	T	P	Credit
UCA23NT11A	Cyber Crime and Cyber Security	NME	2	-	-	2

L - Lecture	T – Tutorial	P – Practical

Year	Semester		Internal	External	Total
I	I		25	75	100

Preamble

The course aims to provide the foundations and awareness towards Cyber Crime with the importance of Cybersecurity

Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Exhibit the concept of cybercrime – the technologies involved and the types of cyber crime	75%	66%
CO2	Identify cybercriminals with the tools used in cybercrime and discuss the factors influencing Cybercrime	76%	68%
CO3	Discuss the strategies that prevent cybercrime and the recent statistics of cybercrime in the Nation	72%	60%
CO4	Explore the various incidents of cybercrime against the Nation with the cyber laws	65%	68%
CO5	Discuss the role of Cybersecurity with its strategies and initiatives to promote cybersecurity	75%	69%

Mapping of COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	L	M	M
CO2	S	S	L	M	S
CO3	M	M	M	M	S
CO4	S	S	M	M	S
CO5	M	S	S	L	L

S-Strong   M- Medium   L- Low

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	M	S	L	S	M
CO2	M	L	S	M	S	L
CO3	S	L	M	M	M	S
CO4	M	M	S	M	S	M

CO5	M	M	S	S	M	L

Blooms Taxonomy

	CA		End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Content

Unit I Introduction to Cybercrime   5 hours

Introduction - Definition - Role of Electronic Communication - Devices and Information
And Communication Technologies in Cybercrime - Types of Cybercrime - Cybercrime against Individuals

Unit II   Classification of Cybercrime   5 hours

Classification of Cybercriminals - Execution of Cybercrime - Tools used in Cybercrime - Factors Influencing
Cybercrime

Unit III Cybercrime Strategies   10 hours

        Strategies to prevent Cybercrimes – Indian perspective – Global Best Practices – Extent of Cybercrimes
– Cybercrime Statistics and World – Cybercrime Statistics in India – Recent Sensitive Cybercrimes –
Latest incidents of Cybercrime in India

Unit IV Cybercrime against Nation and Cyber Laws in India   4 hours

 Cyber Terrorism - Cyber Warfare - Cyber Laundering - Content-related Offences - Cybercrimes and Cyber Laws –
 Crime against Individual - Cyber Defamation - Cyber Stalking - Web Jacking - Violation of Privacy –Crime
 against Property - Theft of Data, Viral Attack - Hacking, Denial of Service Attack, and Cyber Bullying –
 Forgery - Data Diddling- Email Bombing

Unit V Cyber Security   6 hours

Cyber Security - Strategies involved in Cyber Security – Initiatives promoting Cyber Security

Unit	Chapters/Section
Unit I	Book 1: Chap 2 (2.1,2.2,2.4,2.5)
Unit II	Book 1: Chap 2 (2.9,2.10,2.11, 2.12)
Un it III	Book 1: chap 2 (2.14, 2.15)
Unit IV	Book 1: chap 3 (3.4) , chap 13(13.4, 13.5,13.6 (13.6.1-13.6.4)
Unit V	Book1: chap 12(12.4, 12.5, 12.7)

Text Books

 Dejey, Murugan S (2018) Cyber Forensics, Oxford University Press

References

1. https://cybercrime.gov.in/
2. https://www.geeksforgeeks.org/cyber-crime/

Course Designers

1. Dr. V.T.Meenatchi
2. Dr. S.Abirami

Unit	Topic	No.of Lecture Hrs
I	**Introduction to Cybercrime**	**5**
1.1	Role of Electronic Communication	1
1.2	Devices and Information And Communication Technologies in Cybercrime	1
1.3	Types of Cybercrime	1
1.4	Cybercrime against Individuals	2
II	**Classification of Cybercrime**	**5**
2.1	Classification of Cybercriminals	2
2.2	Execution of Cybercrime	1
2.3	Tools used in Cybercrime	1
2.4	Factors Influencing Cybercrime	1
III	**Cybercrime Strategies**	**10**
3.1	Strategies to prevent Cybercrimes	1
3.2	Indian perspective	2
3.3	Global Best Practices	2
3.4	Extent of Cybercrimes	1
3.5	Cybercrime Statistics and World	1
3.6	Cybercrime Statistics with Recent Sensitive Cybercrimes in India	2
3.7	Latest incidents of Cybercrime in India	1
IV	**Cybercrime against Nation and Cyber Laws in India**	**4**
4.1	Cyber Terrorism	1
4.2	Cyber Warfare	1
4.3	Cyber Laundering with Content-related Offences and Cyber Laws	1
4.4	Crime against Individual	1
V	**Cyber Security**	**6**
5.1	Cyber Security	2
5.2	Strategies involved in Cyber Security	2
5.3	Initiatives promoting Cyber Security	2
	Total	**30**

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	Course Title	Category	L	T	P	Credit
UCA23NT11B	Intellectual Property Rights	NME	2	-	-	2
	L - Lecture T – Tutorial P – Practical					

Year	Semester		Internal	External	Total
I	I		25	75	100

Preamble
The course focus on the Intellectual property rights, its categories and the need to protect the Intellectual property.

Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Understanding the basic introduction of Intellectual property	74%	68%
CO2	Identify the History behind the Intellectual property in India with various issues	75%	68%
CO3	Discuss the various laws related to Industrial Design and WIPO	75%	65%
CO4	Explore the trade related aspects of IPR	63%	68%
CO5	Explore the IP organizations in India	74%	69%

Mapping of PO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	L	M	M
CO2	S	S	L	M	S
CO3	M	M	S	M	S
CO4	S	S	M	S	S
CO5	M	S	S	L	M

    S-Strong   **M- Medium**   **L- Low**

Mapping of CO with Pos

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	L	S	L	S	M
CO2	M	M	S	M	S	L
CO3	S	L	S	M	M	S
CO4	M	M	M	L	S	M
CO5	M	S	S	S	M	L

Blooms Taxonomy

| | CA | | End of |
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Content

Unit I INTRODUCTION TO INTELLECTUAL PROPERTY   6 hours

Role of IP in the Economic and Cultural Development of the Society - IP Governance - IP as a Global

Indicator of Innovation - Origin of IP

Unit II   History of IP in India   6 hours

Patents -Copyrights and Related Rights -. Trademarks - Geographical Indications - Patents: Conditions for

Obtaining a Patent Protection - Inventions Eligible for Patenting - Copyrights and Related Rights –

Classes of Copyrights -Criteria for Copyright - Ownership of Copyright - Copyrights of the Author –

Trademarks - Eligibility Criteria -Who Can Apply for a Trademark

Unit III Industrial Designs and WIPO   6 hours

Eligibility Criteria - Acts and Laws to Govern Industrial Designs - Geographical Indications - Acts, Laws

and Rules Pertaining to GI - Ownership of GI - Introduction & Origin of WIPO - Salient Features of WIPO

Unit IV Trade-Related Aspects of Intellectual Property Rights (TRIPS)   6 hours

Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement, (1995) - Introduction - Main

features of TRIPS - Substantive Standards of IP protection -. Patents - Copyrights - Trademarks - Impact of

TRIPS on Relevant Indian Legislation

Unit V IP ORGANIZATIONS IN INDIA   **6 hours**

Department for Promotion of Industry and Internal Trade (DPIIT), New Delhi - Intellectual Property Appellate

Board and its Amendment -. IPO Website -. International Searching Authority (ISA) and International Preliminary

Examination Authority (IPEA) - Rajiv Gandhi National Institute of Intellectual Property Management (RGNIIPM)

- Cell for IPR Promotion and Management (CIPAM)

Unit	Chapters/Section
Unit I	Chap 1 (1.1, 1.2, 1.3,1.4)
Unit II	Chap 1 (1.5 (1.5.1 – 1.5.4), ch.2.(2.1 (2.1.1,2.1.5), 2.2(2.2.1- 2.2.4) 2.3(2.3.1,2.3.2)
Un it III	chap 2 (2.4(2.4.1,2.4.2), 2.5(2.5.1,2.5.2) chap 3(3.1-3.3)
Unit IV	chap 4 (4.23(4.23.1,4.23.2,4.23.3(4.23.1 – 4.23.3) , 4.23.6
Unit V	chap 5 (5.1.1, 5.1.5, 5.1.6, 5.1.7, 5.1.8)

Text Book

Rupinder Tewari, Mamta Bhardwaj (2021), Intellectual Property, A Primer for Academia, Publication Bureau, Panjab University

Reference

1. Sumit Belapure and Nina Godbole (2011), Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives Wiley India Pvt. Ltd. First Edition, 2011
2. https://www.geeksforgeeks.org/cyber-security-types-and-importance/

Course Designers

1. Dr. V.T.Meenatchi

2. Dr. S. Abirami

Unit	Topic	No.of Lecture Hrs
I	**INTRODUCTION TO INTELLECTUAL PROPERTY**	**6**
1.1	Role of IP in the Economic and Cultural Development of the Society	2
1.2	IP Governance	1
1.3	IP as a Global Indicator of Innovation	1
1.4	Origin of IP	2
II	**History of IP in India**	**6**
2.1	Patents -Copyrights and Related Rights	1
2.2	Patents -Copyrights and Related Rights -. Trademarks - Geographical Indications	1
2.3	Patents: Conditions for Obtaining a Patent Protection	1
2.4	Inventions Eligible for Patenting, Copyrights and Related Rights	1
2.5	Classes of Copyrights, Criteria for Copyright Ownership of Copyright , Copyrights of the Author	1
2.6	Trademarks, Eligibility Criteria ,Who Can Apply for a Trademark .	1
III	**Industrial Designs and WIPO**	**6**
3.1	Eligibility Criteria , Acts and Laws to Govern Industrial Designs , Geographical Indications	2
3.2	Acts, Laws and Rules Pertaining to GI and Ownership of GI -	2
3.3	Introduction & Origin of WIPO , Salient Features of WIPO	2
IV	**Trade-Related Aspects of Intellectual Property Rights (TRIPS)**	**6**
4.1	Features of TRIPS	1
4.2	Substantive Standards of IP protection	1
4.3	Patents - Copyrights - Trademarks	2
4.4	Impact of TRIPS on Relevant Indian Legislation	2
V	**IP ORGANIZATIONS IN INDIA**	**6**
5.1	Department for Promotion of Industry and Internal Trade (DPIIT), New Delhi	1
5.2	Intellectual Property Appellate Board and its Amendment ,WIPO Website)	2
5.3	International Searching Authority (ISA) and International Preliminary Examination Authority (IPEA)	1
5.4	Rajiv Gandhi National Institute of Intellectual Property Management (RGNIIPM)	1
5.5	Cell for IPR Promotion and Management (CIPAM)	1
	Total	**30**

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Course Code	Course Title	Category	L	T	P	Credit
UCA23NT21A	Fundamentals of E-Commerce	NME	2	**0**	0	2

L - Lecture   T - Tutorial   P - Practical

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	II	25	75	100

Preamble

Provides the fundamentals knowledge on, E-Commerce, frameworks and architectures, impact of E-Commerce and Electronic Payment.

Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Able to know the basics of E-commerce, framework and its architecture	75%	70%
CO2	Explain the concept of B2C and B2B business	80%	75%
CO3	Discuss the morale, ethics and technology of E-Commerce	80%	70%
CO4	Get knowledge on how the Security and Compliance management handled in E-Commerce	75%	68%
CO5	Describe the concept of Electronic Payment	75%	70%

Mapping of PO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	L	M	M
CO2	S	S	L	M	S
CO3	M	M	S	M	S
CO4	S	S	M	S	S
CO5	M	S	S	L	M

S-Strong   M- Medium   L- Low

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	L	S	L	S	M
CO2	M	M	S	M	S	L
CO3	S	L	S	M	M	S
CO4	M	M	M	L	S	M
CO5	M	S	S	S	M	L

Blooms taxonomy

	CA		End of Semester
	First	Second	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content – E-Commerce Technology

Unit I   **6 hours**
       Basics and Definitions: The Term "E-Commerce"- Business models related to E-Commerce- Technical and economic challenges- **Frameworks and architectures :** Actors and Stakeholders- Fundamental sales process- Technological elements.

Unit II   **6 hours**
       B2C and B2B Business: The process model and its variants-The pricing challenge-the fulfilment challenge-The payment challenge- B2C business and CRM- B2C software systems. The process model and its variants of B2B business-B2B software systems.

Unit III   **6 hours**
       Impact of E-Commerce: Ethics, morale and technology- Ethical aspects of ICT-overall impacts of E-Commerce-Specific impacts of E-Commerce

Unit IV   **6 hours**
       Security and compliance management: Foundations of risk management-Compliance Management- Information security management- Technology- Legal aspects of E-Commerce

Unit V   **6 hours**
       Electronic Payment: Business and money- The payment challenge- payment procedures- Receivables management- Cyber money

Text Book:

1. Martin Kutz,2016 Introduction to E-commerce combining business and Information Technology , 1st edition,.

Unit	Chapters / Sections
I	Chap-1(1.1-1.3), Chap-2(2.1-2.3)
II	Chap-3(3.1-3.6), Chap-4(4.1-4.2)
III	Chap-5(5.1- 5.4)
IV	Chap-6(6.1-6.5)
V	Chap-7(7.1-7.5)

Reference Books:

1. G.S.V.Murthy,2011, E-Commerce Concepts, Models, Strategies- :- Himalaya Publishing House,
3. Gray P. Schneider ,2011, Electronic commerce, International Student Edition,
4. Henry chan, raymond lee, tharam dillon, elizabeth chang , 2011,E-commerce, fundamentals and applications, wiely student edition

Course Designers:

1. Mrs.R. Umamaheswari
2. Dr.V.T. Meenatchi

Lecture Schedule

Sl. No.	Topic	No. of lecture hrs.
1	**Unit – I**	**6 Hrs**
1.1	**Basics and Definitions:** The Term "E-Commerce"- Business models related to E-Commerce	2
1.2	Technical and economic challenges	2
1.3	**Frameworks and architectures :** Actors and Stakeholders- Fundamental sales process- Technological elements	2
2	**Unit – II**	**6 Hrs**
2.1	**B2C and B2B Business:** The process model and its variants-The pricing challenge- the fulfilment challenge	2
2.2	The payment challenge- B2C business and CRM- B2C software systems.	2
2.3	The process model and its variants of B2B business-B2B software systems.	2
3	**Unit – III**	**6 Hrs**
3.1	**Impact of E-Commerce:** Ethics, morale and technology- Ethical aspects of ICT	3
3.2	Overall impacts of E-Commerce	2
3.3	Specific impacts of E-Commerce	1
4	**Unit – IV**	**6 Hrs**
4.1	**Security and compliance management:** Foundations of risk management- Compliance Management	3
4.2	Information security management- Technology	2
4.3	Legal aspects of E-Commerce	1
5	**Unit – V**	**6 Hrs**
5.1	**Electronic Payment:** Business and money- The payment challenge	2
5.2	Payment procedures- Receivables management	2
5.3	Cyber money	2
	Total	**30 Hrs**

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Course Code	Course Title	Category	L	T	P	Credit
UCA23NT21B	PC Hardware and Troubleshooting	NME	2	**0**	0	2

L - Lecture   T - Tutorial   P - Practical

Year	Semester	Max. Marks CA	Max. Marks SE	Total
I	II	25	75	100

Preamble

Provides the fundamentals knowledge on, Understand how PC, CPU, Motherboard, Bus and Input Device Works and Install, Configuring Various Type of devices.

Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Illustrate the architecture of modern computer system	75%	75%
CO2	Explain the concept of mother boards and buses	80%	75%
CO3	Explain the concept of various memories.	80%	75%
CO4	Illustrate the uses of BIOS	75%	70%
CO5	Describe the system assembling and maintenance	75%	70%

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	L	S	M
CO2	S	S	M	L	M	M
CO3	S	M	M	M	L	L
CO4	M	L	L	M	L	L
CO5	S	M	M	L	L	L

(S – Strong , M – Medium , L – Low)

	CA		End of Semester
	First	Second	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content : PC Hardware and Troubleshooting

Unit I   **6 hours**

        Introduction to PC: Definition of PC – Types – System Components. **Processor**: Processor Specifications – Modes – Features – Manufacturing – Physical Packaging – Multi Core Processors – Processor Upgrades – Processor Troubleshooting Techniques.

Unit II   **6 hours**

        Motherboards and Buses: Motherboard Form Factors – Motherboard Connectors - System Bus Types Functions & Features - Types of I/O Buses – System Resources - Motherboard Selection Criteria.

Unit III   **6 hours**

        Memory: Memory Basics: ROM – DRAM - Cache Memory – SD RAM – DDR SDRAM. **Memory Modules**: SIMM – DIMM - RIMM. **Hard Disk Storage**: Definition of Hard Disk – Hard disk Drive Components – Drive Operation – Features.

Unit IV   **6 hours**

        BIOS: BIOS Basics – BIOS Hardware/Software - Motherboard ROM BIOS – Upgrading the BIOS – Preboot Environment – CMOS Setup Specifications- Plug and Play BIOS – BIOS Error Messages.

Unit V   **6 hours**

        System Assembling and Maintenance: System Assembly – Motherboard Installation – Troubleshooting New Installations – Installing the Operating Systems – PC Diagnostics – Diagnostics Software - PC Maintenance Tools – Preventive Maintenance.

Text Book:

1. Scott Mueller, (2015). Upgrading & Repairing PCs. (22nd edition). New Jersey: Pearson Education.

Unit	Chapters / Sections
I	From chapters 2,3
II	From chapter 4
III	From chapter 6,7
IV	From chapter 5
V	From chapter 18,19

Reference Books:

1. Stephen J. Bigelow, (2017). Troubleshooting, Maintaining, & Repairing PCs. (5th edition). New Delhi: Osborne/McGraw-Hill.
2. Craig Zacker, & John Rourke, (2017).The Complete Reference: PC Hardware. (Indian edition). New Delhi: McGraw Hill Education.

Course Designers:

1. Mr. K.Muthuchamy
2. Dr. V.T Meenatchi

Lecture Schedule

Unit	Topic	No.of Lecture Hrs
I	**Introduction to PC**	**6**
1.1	Definition of PC **Processor**	1
1.2	System Types, System Components	1
1.3	Processor Specifications, Modes	1
1.4	Processor Features, Manufacturing	1
1.5	Physical Packaging, Multi Core Processors	1
1.6	Processor Upgrades, Troubleshooting Techniques.	1
II	**Motherboards and Buses**	**6**
2.1	Motherboard Form Factors	1
2.2	Motherboard Connectors	1
2.3	System Bus Types Functions & Features	1
2.4	Types of I/O Buses	1
2.5	System Resources	1
2.6	Motherboard Selection Criteria.	1
III	**Memory**	**6**
3.1	**Memory Basics**: ROM – DRAM - Cache Memory – SD RAM – DDR SDRAM.	2
3.2	**Memory Modules**: SIMM – DIMM - RIMM.	2
3.3	**Hard Disk Storage**: Definition of Hard Disk – Hard disk Drive Components – Drive Operation – Features.	2
IV	**BIOS**	**6**
4.1	BIOS Basics – BIOS Hardware/Software	1
4.2	Motherboard ROM BIOS – Upgrading the BIOS	1
4.3	Preboot Environment	1
4.4	CMOS Setup Specifications	1
4.5	Plug and Play BIOS	1
4.6	BIOS Error Messages	1
V	**System Assembling and Maintenance**	**6**
5.1	System Assembly, Motherboard Installation	1
5.2	Troubleshooting New Installations	1
5.3	Installing the Operating Systems	1
5.4	PC Diagnostics – Diagnostics Software	1
5.5	PC Maintenance Tools	1
5.6	Preventive Maintenance	1
	Total	**30**