Course Descriptions for first semester of Bachelor of Science (B. Sc.) in Computer Science programme for students of 2023-27 batch

Introduction to Programming Using C (22B21MA111)

Introduction to Programming Using C will cover Introduction, Data types, Operators, and Control Flow, Array, Functions, Structures and Union, Pointers and File Handling.

Course Description

Course Code	**22B21MA111**	**Semester: Odd**	**Semester I Session 2023-24 Month from Jul 2023 to Dec 2023**	
Course Name	**Introduction to Programming Using C**			
Credits	**3**	**Contact Hours**	**3-0-0**	
	Coordinator(s)			
	Teacher(s) (Alphabetically)			

COURSE OUTCOMES: After the successful completion of this course, the student will be able to		**COGNITIVE LEVELS**
CO1	explain various data types, memory allocation schemes, precedence of arithmetical and logical operations, and need of array, and structures	Understand Level (C2)
CO2	explain the flow chart and write the high-level code for different problems	Understand Level (C2)
CO3	apply and implement functions with or without pointers for different problems	Apply Level (C3)
CO4	apply and implement various operations like traverse, insertion, deletion, etc. on files	Apply Level (C3)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures**
1.	Introduction	Introduction to Logic building, Step by step solution to simple problems, developing logic/flow-chart/pseudo code to solve problems like simple/logical games, puzzles.	9
2.	Data types, Operators, and Control Flow	Data, variables and constants, data types, operators – binary, unary, ternary, operator precedence, operations using different operators, if, if-else, while, do-while, for, switch-case in C Programming	9
3.	Array	Fundamentals of Array, Implementation of 1D/2D Array and related operations like insertion, traversal, updation, etc. in C programming using different problems	6
4.	Functions	Introduction to Functions and its implementation in C programming language, Functions using Pass by value, recursive functions	4
5.	Structures and Union	Introduction and implementation of Structures and Union in C programming, Array of Structures and related operations like insertion, traversal, updation, etc. in C programming using different problems, Function using structures	4
6.	Pointers	Pointers in C, Dynamic memory allocation for	6

		1D/2D array and structures, Arithmetical operations on pointers, functions using pass by reference	
7.	File Handling	Introduction to File, creation of files in C programming language, Modes of File Handling like read, write, update; different types of files like binary file and text file and respective operations like, opening, closing, reading, writing, end of file.	4
		Total Number of Lectures	**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz, Assignments)
Total	**100**

Project based learning: Each student in a group of 4-5 will apply the concepts of C programming to solve practical problems.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc)

Text Books	
1	H. Schildt. "The Complete Reference C", 4th Edition, TMH, 2000
2	A. N. Kamthane, "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2006
3	H. Cooper, H. Mullish, "Spirit of C", 4th Edition, Jaico Publishing House, 2006
4	G. Perry, D. Miller, "C Programming Absolute Beginner's Guide Paperback", QUE; 3rd edition, 2013
5	Y. Kanetkar, "Let Us C: Authentic Guide to C Programming Language" 17th edition, BPB publisher, 2020.
Reference Books	
1	D. Griffiths, D. Griffiths, "Head First C: A Brain-Friendly Guide", O'Reilly Media, Inc., 2012.
2	B. W. Kernighan, D. M. Ritchie, "The C Programming Language", 2nd Edition, Prentice-Hall India, New Delhi, 2002
3	B. A. Forouzan, R. F. Gilberg "Computer Science: A Structured Programming Approach Using C", 2nd Edition, Thomson Press, New Delhi, 2006

CO-PO-PSO Mapping:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO-CS**	**PSO-IT**	**PSO-CP**
CO1	3	2	1	1	1		2	1	2	3	3	3
CO2	3	2	2	3	1		3	1	2	3	3	3
CO3	3	2	2	2	1		2	1	2	2	2	2
CO4	3	2	2	2	1		3	1	2	3	3	3
Avg	**3**	**2**	**2**	**2**	**1**		**3**	**1**	**2**	**3**	**3**	**3**

Introduction to Programming Using C LAB (22B25MA111)

Introduction to Programming Using C Lab will cover Introduction, Data types, Operators, and Control Flow, Array, Functions, Structures and Union, Pointers and File Handling

Course Description

Course Code	**22B25MA111**	**Semester: Odd**	**Semester I Session 2023-24** **Month from Jul 2023 to Dec 2023**
Course Name	**Introduction to Programming Using C LAB**		
Credits	**2**	**Contact Hours**	0-0-4
Faculty (Names)	**Coordinator(s)**		
	Teacher(s) (Alphabetically)		

COURSE OUTCOMES: After the successful completion of this course, the student will be able to		**COGNITIVE LEVELS**
CO1	develop programs/logic for data types, expressions and conditional structure.	Apply Level (C3)
CO2	develop programs for array and functions.	Apply Level (C3)
CO3	develop programs for structure and union.	Apply Level (C3)
CO4	develop programs of pointers and recursive functions.	Apply Level (C3)
CO5	construct menu driven programs to perform basic file operations.	Apply Level (C3)

Module No.	**Title of the Module**	**List of Experiments**	**No of Labs**
1.	Introduction	Introduction to Logic building, Step by step solution to simple problems, developing logic/flow- chart/pseudocode to solve problems like simple/logical games, puzzles. Introduction to Code block (Editor for C)	4
2.	Data types, Operators, and Control Flow	Data, variables and constants, data types, operators – binary, unary, ternary, operator precedence, operations using different operators, if, if-else, while, do-while, for, switch-case in C Programming	4
3.	Array	Fundamentals of Array, Implementation of 1D/2D Array and related operations like insertion, traversal, updation, etc. in C programming using different problems	4

4.	Functions	Introduction to Functions and its implementation in C programming language, Functions using Pass by value, recursive functions	4
5.	Structures and Union	Introduction and implementation of Structures and Union in C programming, Array of Structures and related operations like insertion, traversal, updation, etc. in C programming using different problems, Structures using function	4
6.	Pointers	Pointers in C, Dynamic memory allocation for 1D/2D array and structures, Arithmetical operations on pointers, functions using pass by reference	4
7.	File Handling	Introduction to File, creation of files in C programming language, Modes of File Handling like read, write, update; different types of files like binary file and text file and respective operations like, opening, closing, reading, writing, end of file.	4
		Total No. of Labs	**28**

Evaluation Criteria

Components	**Maximum Marks**
Lab Test -1	20
Lab Test -2	20
Day to Day	60
(Evaluation 1- 15, Evaluation 2- 15, Mini Project- 15, Attendance- 15)	
Total	**100**

Project based learning: Each student in a group of 3-4 will develop a mini project with the help of various concepts of C programming. In a team they will learn how to apply the concepts for problem solving in a meaningful way.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc)

Text Books	
1	H. Schildt. "The Complete Reference C", 4th Edition, TMH, 2000
2	A. N. Kamthane, "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2006
3	H. Cooper, H. Mullish, "Spirit of C", 4th Edition, Jaico Publishing House, 2006
4	G. Perry, D. Miller, "C Programming Absolute Beginner's Guide Paperback", QUE; 3rd edition, 2013
5	Y. Kanetkar, "Let Us C: Authentic Guide to C Programming Language" 17th edition, BPB publisher, 2020.
Reference Books	
1	D. Griffiths, D. Griffiths, "Head First C: A Brain-Friendly Guide", O'Reilly Media, Inc., 2012.
2	B. W. Kernighan, D. M. Ritchie, "The C Programming Language", 2nd Edition, Prentice-Hall India, New Delhi, 2002
3	B. A. Forouzan, R. F. Gilberg "Computer Science: A Structured Programming Approach Using C", 2nd Edition, Thomson Press, New Delhi, 2006

CO-PO-PSO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO-CS	PSO-IT	PSO-CP
CO1	3	2	1	1	1		2	1	2	3	3	3
CO2	3	2	1	1	1		2	1	2	3	3	3
CO3	3	2	2	2	1		2	1	2	3	3	3
CO4	3	2	2	2	1		3	1	2	3	3	3
CO5	3	2	3	2	1		3	1	2	3	3	3
Avg	**3**	**2**	**2**	**2**	**1**		**3**	**1**	**2**	**3**	**3**	**3**

Discrete Mathematical Structures (22B21MA113)

Set theory, basic operations on sets, Venn diagram, relations, Hasse diagram, lattices, boolean algebra, numeric functions, generating functions, recursive functions, solution of recurrence relations of constant coefficients, predicate and propositional calculus, graphs, subgraphs, isomorphism of graphs, Eulerian and Hamiltonian graph, graph coloring, minimum spanning tree, digraphs, adjacency matrix, incidence matrix, path matrix, groups, rings, fields.

Course Description

Course Code	**22B21MA113**	**Semester Odd**	**Semester I Session 2023-24 Month from Jul 2023 to Dec 2023**
Course Name	**Discrete Mathematical Structures**		
Credits	**4**	**Contact Hours**	**3-1-0**
Faculty (Names)	**Coordinator(s)**		
	Teacher(s) (Alphabetically)		

COURSE OUTCOMES: After the successful completion of this course, the student will be able to		**COGNITIVE LEVELS**
CO1	explain partial order relations and Hasse diagram	Understand Level (C2)
CO2	explain lattices and Boolean algebra and solve the problem of recurrence relations of constant coefficients.	Apply Level (C3)
CO3	explain the propositional and predicate calculus to check the validity of arguments.	Understand Level (C2)
CO4	demonstrate graphs, digraphs, trees and use it to solve the different problems of graph theory.	Apply Level (C3)
CO5	illustrate various algebraic structures and their properties.	Understand Level (C2)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures**
1.	Set theory and	Basic concept of set theory, operations on sets, Venn	10

	Relations	diagram, relations and their composition, pictorial representation, matrix and graphical representations, equivalence relations and partitions, closure of relation, Warshall's algorithm for transitive closure, partial ordered relations and POSET, Hasse diagram, Isomorphism of partial order relation	
2.	Lattices, Boolean Algebra and Numeric Functions	Different types of lattices, isomorphic lattices, Boolean algebra, discrete numeric functions, asymptotic behavior of numeric functions, generating functions, solution of recurrence relations by generating function, recursive functions, homogenous and particular solution of recurrence relations of constant coefficients.	12
3.	Predicate and Propositional Calculus	Propositions- simple and compound, basic logical operators and their truth tables, tautologies and contradictions, validity of arguments. Normal forms: disjunctive and conjunctive normal forms, Predicates and quantifiers, logical equivalence.	7
4.	Graphs	Graphs and related definitions, subgraphs, isomorphism, paths and connectivity, Eulerian graph and Konigsberg problem, Hamiltonian graph, minimum spanning tree (Prim's algorithm), graph colorings, digraphs, adjacency matrix, incidence matrix, path matrix	9
5.	Algebraic Structures	Groups- definitions and examples, order of elements, subgroup, cyclic group, rings and fields.	4
		Total number of Lectures	**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz, Assignments, Tutorials)
Total	**100**

Project based learning: A group of 4 to 5 students will be formed. Each group will have a group leader to develop coordination among the group members. Each group will be assigned a problem related to the diversified applications of graph theory. The group leader of each group will submit a report of 6-7 pages and then finally each member of the group will be evaluated through a viva voce.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc)

1.	S. Lipschutz, M.L. Lipson, and V.H. Patil, Discrete Mathematics, Revised 3rd Edition, McGraw-Hill Education, 2017.
2.	K.H. Rosen, Discrete Mathematics and its Application, 7th Edition, Tata McGraw-Hill, 2011.
3.	C. L. Liu, D. Mahapatra, Elements of Discrete Mathematics: A Computer Oriented Approach, 4th Edition, McGraw-Hill, 2017.
4.	B. Kolman, R.C. Busby, and S. Ross, Discrete Mathematical Structures, 6th Edition, Pearson Education India, 2015.
5.	N. Deo, Graph Theory, Prentice Hall of India, 1980.

6.	R.P. Grimaldi, Discrete and Combinatorial Mathematics, 4th Edition, Pearson Education, 2005.

CO-PO-PSO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO-CS	PSO-IT	PSO-CP
CO1	2	2	2	1	1		1	2	2	1	1	1
CO2	2	2	2	1	1		1	1	2	2	1	2
CO3	1	2	1	1	1		1	1	1	1	1	1
CO4	3	2	2	2	1		2	1	2	2	2	2
CO5	2	1	2	2	1		2	1	2	2	2	2
Avg	**2**	**2**	**2**	**2**	**1**		**2**	**2**	**2**	**2**	**2**	**2**

Optics and Electromagnetism (23B21PH111)

Interference, Diffraction and Polarization of Light, Gauss's Law and applications, Laplace and Poisson's Equations, Maxwell's Equations, Electromagnetic Waves, Poynting's theorem and Poynting vector, Propagation of Electromagnetic waves in Free Space, Transverse nature of EM waves, Energy and momentum in EM waves, Lasers, Principles and working of lasers, three level Laser Scheme, Ruby laser, Applications of lasers Optical Fiber, working principle, applications of fiber.

Course Description

Course Code	**23B21PH111**	**Semester Odd**	**Semester I Session 2023-24 Month from Jul 2023 to Dec 2023**	
Course Name	**Optics and Electromagnetism**			
Credits	3	**Contact Hours**	3-0-0	
Faculty (Names)	**Coordinator(s)**			
	Teacher(s) (Alphabetically)			
COURSE OUTCOMES: After the successful completion of this course, the student will be able to				**COGNITIVE LEVELS**
CO1	recall the basic principles of physics related to optics, electromagnetic theory, laser and fiber optics.			Remember Level (C1)
CO2	illustrate the various physical phenomena with interpretation based on the mathematical expressions involved.			Understand Level (C2)
CO3	apply the concepts/principles to solve the problems related to wave nature of light, electromagnetic theory, laser and optical fiber.			Apply Level (C3)
CO4	analyze and examine the solution of the problems using physical and mathematical concepts involved.			Analyze Level (C4)
Module No.	**Title of the Module**	**Topics in the Module**		**No. of Lectures**

1.	Physical Optics	Interference: Introduction to wave nature, analytical treatment of interference, Intensity distribution of fringe system, Fresnel's Bi-prism, interference by thin films, Newton's rings. Diffraction: Introduction, Diffraction (limited to Fraunhofer class) from Single slit, double slit and Diffraction grating. Polarization: Introduction to polarization, Brewster's law, Malus law, Birefringence, Principles of use of uni-axial crystals in practical polarizers, compensators and wave plates, Optical activity.	17
2.	Electromagnetic Theory	Introduction of electromagnetism, Basic idea of Cartesian, Spherical polar and cylindrical coordinate systems, Basics of fields, Gradient, Divergence and Curl, Coulomb's law, Electric Flux & Gauss's law, Applications of Gauss law for Spherical and Cylindrical symmetries (all important cases), conductors, Force per unit area on the surface of the charged conductor, Laplace and Poisson's equations, Maxwell's correction to Ampere's law, Displacement current, Maxwell's equations in free space and dielectric media, Poynting's theorem (derivation) and Poynting vector, Electromagnetic waves in free space (equations and solutions) and Transverse nature of EM waves, Energy and momentum in EM waves.	15
3.	Lasers	Introduction to Laser, spontaneous and stimulated emission, population inversion, Einstein A and B coefficients, Principles and working of lasers, Three level Laser Scheme, Ruby laser, Applications of lasers	4
4.	Optical Fiber	Concept of optical fiber and Principle of Total Internal Reflection in optical fiber, Numerical aperture and Single, multistep & graded index fiber, Attenuation coefficient, Transmission losses in optical fiber, Applications of an optical fiber.	4
		Total number of Lectures	**40**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz, Assignments, Tutorials)
Total	**100**

Project based learning: The students will be given small projects (in groups) on various topics like Interference, diffraction, polarization, electromagnetism, laser and optical fiber to explore their applications in advanced technology to understand the role of physics. This will help the students to connect the concept studied in the class with their application in technology and will enhance their analytical skills.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc)

1.	A. K. Ghatak, *Optics*, Tata McGraw Hill.
2.	E. Hecht, *Optics*, Pearson Education.
3.	F. A. Jenkins, H. E. White, *Fundamentals of optics*, Tata McGraw Hill.
4.	D. J. Griffiths, Introduction to Electrodynamics, Prentice-Hall India.
5.	G. Keiser, Optical Fiber Communications, Tata Mc Graw Hill Education.

ENGLISH (22B28HS111)

English as a Communication Tool: Basic aspects of English: LSRW: Listening, Speaking, Reading, Writing. Non-Verbal Communication, Presentation Techniques, Gambits, Phonetics, Grammar, Vocabulary Enrichment techniques, Error Analysis. Literary & Rhetorical Devices, Textual Organization: Letter Writing, Email Etiquettes, Feedbacks and Review Writing· Notice, Agenda and Minutes· Format of Report Writing· CV and Resume.

Course Description

Course Code	**22B28HS111**	**Semester Odd**	**Semester I Session 2023-24 Month from Jul 2023 to Dec 2023**	
Course Name	**English**			
Credits	**2**	**Contact Hours**	**1-0-2**	
Faculty (Names)	**Coordinator(s)**			
	Teacher(s) (Alphabetically)			
COURSE OUTCOMES: After the successful completion of this course, the student will be able to				**COGNITIVE LEVELS**
CO1	develop an understanding and appreciate the basic aspects of English as a communication tool.			Understand Level (C2)
CO2	apply grammar concepts and vocabulary skills in presentation and in spoken and written communication.			Apply Level (C3)
CO3	identify and explain different literary and rhetorical devices used in discourse.			Analyze Level (C4)
CO4	compose different forms of professional writing.			Create Level (C6)
CO5	apply Phonetics through theory and practice for better pronunciation.			Apply Level (C3)
Module No.	**Title of the Module**	**Topics in the Module**		**No. of Lectures**
1.	English as a Communication Tool	Communication, Basic aspects of English: LSRW: Listening/ Speaking, Reading/ Writing, Non-Verbal Communication, Presentation Techniques and Gambits for Interviews		6
2.	Language and Literary devices	Phonetics: Pronunciation, Stress, Rhythm, Intonation, Literary and Rhetorical Devices		2
3.	Professional Application/Writing	Letter Writing, Email Etiquettes, Review Writing, Notice, Agenda and Minutes, Format of Report Writing, CV and Resume		3
4.	Grammar &	Parts of Speech and Agreement of Noun-Verb,		3

	Vocabulary	Tense, Aspect, Mood and Voice, Vocabulary Enrichment techniques, Synonyms, Antonyms, Homonyms, Homophones, Collocation	
		Total number of Lectures	**14**

English LAB

Module No.	**Title of the Module**	**List of Experiments**	**No. of Lectures**
1	Interpersonal Oral Communication through self-Introduction	Interpersonal Communication; Learning the Impact of Perception on Interpersonal Communication	2
2	Confident Non-Verbal Behaviour	To be able to impart good body language and learn aspects of non-verbal behaviour	2
3	Basics of Formal Presentations	PPT Presentation; Reading Newspapers, comprehending and presenting in own words with confidence & assertiveness	2
4	Listening through Language Lab Software (SKY IELTS)	Active Listening; Academic Listening; Listening to Debates and Presentations; Note-taking Techniques; comprehending through lab software	2
5	Phonetics and Pronunciation through lab (SKY Pronounce)	Phonetics; Speaking	2
6	Reading Practice & Comprehension through SKY Read Up Speed Up Software	Purpose, Process, Methodologies; Skimming and Scanning; Levels of Reading; Reading Comprehension; Academic Reading Tips	2
7	Grammar for Professional Writing Requirements: Parts of Speech; Tense, Voice, Types of Sentences; Vocabulary Enhancement	Passage Comprehension; Jumbled Paragraphs for grammar learning; Summary/Inference of short paragraph; Picking the Out of Context sentence in a Jumbled Paragraph; Email Writing etiquettes; Nature and Style of sensible Writing: Describing, Defining, Classifying, providing examples or evidence,Writing introduction and conclusion	2
		Total No. of Labs	**14**

Evaluation Criteria

Components	**Maximum Marks**
Mid Term	30 (Lab Exam)
End Semester Examination	40
TA	30 (Quiz, Assignments, Tutorials)
Total	**100**

PBL Component: The creative writing project is to be done in a group of 3-4 students. Students will be asked to choose one specific word that impacts all six dimensions of their life-mental, physical, emotional, relational, spiritual and financial and create a project based on that.	
Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc)	
1.	C.L. Bovee, J.V.Thill, and M.Chaturvedi, *Business Communication Today*,9th Ed, Pearson Education, copyright@ Dorling Kinderslay (India) Pvt Ltd,2009
2.	K. M. Quintanilla and S.T.Wahl, *Business and Professional Communication*, Sage Publications Pvt India Ltd,2011
3.	S. Kumar, P. Lata, *Communication Skills*, Oxford University Press,1st, Ed. 2011
4.	R.K Bansal, J.B Harrison, *Spoken English for India*, Orient Longman, 2018
5.	M A Yadugiri, The Pronunciation of English: Principles and Practice, Viva Books Pvt. Ltd, India, 2015
6.	A. R. Rizvi, Effective Technical Communication, 2nd edition, McGraw Hill Education Private Limited, Chennai, 2018.
7.	R. Murphy, English Grammar in Use, 4th edition, Cambridge University Press, 2012.
8.	M. Hewings, *English Pronunciation in Use*. Advanced. Cambridge: CUP, 2009
9.	K. Mohan, N. P. Singh, *Speaking English Effectively* 2nd Edition. Macmillan Publishers India Ltd. Delhi. 2011
10.	E. S. Kumar, P. Sreehari, *A Handbook for English Language Laboratories*. New Delhi: Foundation, 2009.

CO-PO-PSO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO-CS	PSO-IT	PSO-CP
CO1								3	2			
CO2							1	3	2			
CO3								3	2			
CO4							1	3	2			
CO5								3				
Avg							**1**	**3**	**2**			

Life Skills and Effective Communication (22B12HS111)

Overview of Life Skills, Life Skills for Self, Family, Society and lifelong success. Advanced Reading and Comprehension Skills, inferring lexical and contextual meaning, employing discourse analysis, Advanced Speaking Skills, Advanced Writing skills. Team- work skills, Empathy, Emotional Intelligence, VUCA Leadership, Resilience, Tolerance, Self-Belief and Time Management. Presentation and Interaction Skills: Speech Delivery, Group Discussion, Presentation Skills, Public Speaking, Audience Analysis, Interviews, Assessment of Personality. Creativity: Definition; Characteristics of Creative Person: Fluency; Originality; Curiosity; Critical Thinking, Problem Solving Techniques. Harmony in personal and social life, Concept of personal and group Ethics; Balance between - rights and duties-welfare of self and welfare of all.

Understanding Nine universal values in relationships. Character, Righteousness and Virtues for A Meaningful Life: Self-Realization Through Spiritual texts.

Course Description

Course Code	**22B12HS111**	**Semester: Odd**	**Semester I Session 2023-24** **Month from** July 2023 –Dec 2023	
Course Name	**Life Skills and Effective Communication**			
Credits	**3**	**Contact Hours**	2-0-2	
	Coordinator(s)			
	Teacher(s) (Alphabetically)			

COURSE OUTCOMES: After the successful completion of this course, the student will be able to		**COGNITIVE LEVELS**
CO1	explain different life skills required for Self, Family, Society and lifelong success.	Understand Level (C2)
CO2	apply listening, speaking, reading and writing skills in professional environment.	Apply Level (C3)
CO3	examine work-place skills for personal and professional excellence.	Analyze Level (C4)
CO4	evaluate and make decisions for empowerment of self and others.	Evaluate Level (C5)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures**
1.	**Introduction**	Overview of Life Skills: Meaning and significance of life skills, Life skills identified by various organizations, Life Skills for Self, Family, Society and lifelong success.	3
2.	**Advanced LSRW Skills**	Advanced Reading and Comprehension Skills, inferring lexical and contextual meaning, employing discourse analysis, Advanced Speaking Skills: Conversations, Dialogues and Debates, Persuasion, Negotiation Skills, Expressing Opinions, Agreement and Disagreement, Advanced Listening Skills, Advanced Writing skills: The art of Condensation, Note making, Essay Writing.	5
3.	**Work-Place Skills**	Interpersonal Skills: Team- work skills, Empathy, Emotional Intelligence, VUCA Leadership, Resilience, Tolerance, Self-Belief and Time Management	3
		Presentation and Interaction Skills: Speech Delivery, Group Discussion, Presentation Skills (Focused and targeted information seeking and presentation), Public Speaking, Audience Analysis, Interviews, Assessment of Personality - Projective& Self Report Techniques - Building Self-Confidence – Enhancing Personality Skills.	4

		Creativity and Critical Thinking: Creativity: Definition; Characteristics of Creative Person: Fluency; Originality; Curiosity; Critical Thinking, Problem Solving Techniques: Six Thinking Hats, Mind Mapping etc.	4
4.	**Ethics and Holistic Life**	Harmony in personal and social life: Professional Integrity, Respect & Equality, Building Trusting Relationships. Concept of personal and group Ethics; Balance between - rights and duties-welfare of self and welfare of all. Understanding Nine universal values in relationships. Understanding harmony in the Family. Harmony in the Family; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship. Understanding the harmony in the society (society being an extension of family): Undivided Society (AkhandSamaj), Universal Order (Sarvabhaum Vyawastha)- from family to world family. Gender Harmony & equity.	5
		Character, Righteousness and Virtues for A Meaningful Life: Self-Realization Through Spiritual texts: Egoless, Humility, Righteousness, Purity, Truthfulness, Integrity, Self-restraint, Self-control, Sense of responsibility, Empathy, Love, Compassion, Maitri / Comradeship, Cooperation, Tolerance and Gratitude.	4
		Total Number of Lectures	**28**

LIFE SKILLS AND EFFECTIVE COMMUNICATION LAB

Experiment No.	Title of the Module	List of Experiments	CO
1.	Introduction	Tell Me About Yourself & Elevator Pitch	CO1
2.		Personal Effectiveness and Who Am I activity	CO1
3.	Advanced LSRW Skills	Academic Listening	CO2
4.		Reading	CO2
5.		Essay Writing	CO2
6.	Work-Place Skills	Group Discussions-1	CO3
7.		Group Discussions-2	CO3
8.		Technical Presentations-1	CO3
9.		Technical Presentations-2	CO3
10.		Critical Thinking and Creativity	CO3
11.		Handling Interviews	CO3
12.	Ethics and Holistic Life	TED Talk analysis of Social, Health and Cultural analysis	CO4
13.		TED Talk analysis of Social, Health and Cultural analysis	CO4
14.		Self-Realization Through Spiritual texts	CO4

Evaluation Criteria	
Components	**Maximum Marks**
Mid Term	30 (Lab Exam)
End Semester Examination	40
TA	30 (Quiz, Assignments, Tutorials)
Total	**100**

Project Based Learning: Students, in groups of 4-5, are required to visit Old Age Home/ Underprivileged Children/ NGO/ Cancer Hospital / etc. Spend time with them for 3-4 hours. Apply Life Skills learned in understanding their feeling and help them by providing solution to ease their stress. Document your visit and present in the class.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	A. Wadkar, Life Skills for Success, Sage Publication Pvt Ltd, 2019
2.	Human Values, A.N. Tripathi, New Age International Pvt Ltd. Publishers New Delhi ,2005
3.	C. Dale, Become an Effective Leader, New Delhi: Amaryllis, 2012
4.	H. R. Wallace et. al, Personality Development, Cengage Learning India Pvt. Ltd; New Delhi, 2006
5.	B. K. Mitra, Personality Development & Soft Skills, Oxford University Press, New Delhi, 2012.
6.	M. G. Frank, D. Matsumoto, H. S. Hwang, Nonverbal Communication: Science and Applications, 2012, 1st Edition, Sage Publications, New York.
7.	W. S. Pfeiffer, Public Speaking, Pearson, Delhi, 2012.
8.	S. Khera, You Can Win, Macmillan Books, New York, 2003.
9.	S. Kumar, P. Lata, Communication Skills, Oxford University Press,1st, Ed. 2011
10.	M. Raman, S. Sharma, Technical Communication: Principles & Practices, 29th Impression, Oxford University Press, New Delhi, 2009

CO-PO-PSO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO-CS	PSO-IT	PSO-CP
CO1					3		1		3			
CO2								3	3			
CO3							3	3	3			
CO4					3		2		3			
Avg					**3**		**2**	**3**	**3**			

Multimedia and Animation Workshop (22B28MA111)

Microsoft Word, Microsoft Excel, Microsoft Power Point, Introduction to Image tools, Basic Photo Corrections, Working with Selections, Layer Basics, Masks and Channels, Typographic Design and Video tools.

Course Description

Course Code	**22B28MA111**	**Semester: Odd**	**Semester I Session 2023-24** **Month from** July 2023 –Dec 2023
Course Name	**Multimedia and Animation Workshop**		
Credits	**2**	**Contact Hours**	1-0-2
	Coordinator(s)		
	Teacher(s) (Alphabetically)		

COURSE OUTCOMES: After the successful completion of this course, the student will be able to		**COGNITIVE LEVELS**
CO1	explain the concepts of Microsoft office tools such as word, PowerPoint and excel	Understanding Level (C2)
CO2	apply basic text editing, text formatting. page formatting, methods and reasons for using templates	Applying Level (C3)
CO3	apply basic Excel spreadsheet operations, data entry, and functions and basic Microsoft PowerPoint operations	Applying Level (C3)
CO4	explain the concept of image tools and functions	Understanding Level (C2)
CO5	make use of working with photo correction, Straightening and cropping	Applying Level (C3)
CO6	apply working with selections, layers, masks and channel.	Applying Level (C3)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures**
1.	Microsoft Word	Microsoft Word: Creating, editing, saving and printing text documents, Font and paragraph formatting, Simple character formatting, Inserting tables, smart art, page breaks, Using lists and styles, Working with images, Using Spelling and Grammar check, Understanding document properties, Mail Merge	1
2.	Microsoft Excel	Spreadsheet basics, Creating, editing, saving and printing spreadsheets, working with functions & formulas, modifying worksheets with color & auto formats, graphically representing data: Charts & Graphs, speeding data entry: Using Data Forms, analyzing data: Data Menu, Subtotal, Filtering Data, formatting worksheets, Securing & Protecting spreadsheets	2
3.	Microsoft Power Point	Opening, viewing, creating, and printing slides, applying auto layouts, adding custom animation, using slide transitions, graphically representing data: Charts & Graphs, Creating Professional Slide for Presentation	1
4.	Introduction to Image tools	Raster vs. Vector, creating new images, saving files for print, saving files for web/screen, Working with Adobe Bridge, Using the tools, Using the options bar and other panels, Undoing actions in Photoshop, Customizing the workspace, Tools panel overview	2
5.	Basic Photo	Strategy for retouching, Resolution and image size,	2

	Corrections	Adjusting the color in Camera Raw, Straightening and cropping the image in Photoshop, replacing colors in an image, adjusting saturation with the Sponge tool, repairing areas with the Clone Stamp tool, Using the Spot Healing Brush tool, using content-aware fill, Applying the Unsharp Mask filter	
6.	Working with Selections	About selecting and selection tools, Using the Quick Selection tool, moving a selected area, manipulating selections, Using the Magic Wand tool, selecting with the lasso tools, rotating a selection, selecting with the Magnetic Lasso tool, cropping an image and erasing within a selection, Refining the edge of a selection,	2
7.	Layer Basics, Masks and Channels	About layers, Using the Layers panel, rearranging layers, applying a gradient to a layer, applying a layer style, Flattening and saving files, working with masks and channels, creating a mask, refining a mask, creating a quick mask, manipulating an image with Puppet Warp, Working with channels	2
8.	Typographic Design and Video tools	About type, creating a clipping mask from type, creating type on a path, Warping point type, Designing paragraphs of type. Video tools: Open Shot; Shortcut; Blender; Movie Maker 10; iMovie; Kapwing; KineMaster, Lightworks etc.	2
		Total Number of Lectures	**14**

Multimedia and Animation Workshop LAB

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Labs**
1.	Microsoft Word	Microsoft Word: Creating, editing, saving and printing text documents, Font and paragraph formatting, Simple character formatting, Inserting tables, smart art, page breaks, Using lists and styles, Working with images, Using Spelling and Grammar check, Understanding document properties, Mail Merge	1
2.	Microsoft Excel	Spreadsheet basics, Creating, editing, saving and printing spreadsheets, Working with functions & formulas, Modifying worksheets with color & auto formats, Graphically representing data: Charts & Graphs, Speeding data entry: Using Data Forms, Analyzing data: Data Menu, Subtotal, Filtering Data, Formatting worksheets, Securing & Protecting spreadsheets	2
3.	Microsoft Power Point	Opening, viewing, creating, and printing slides, Applying auto layouts, Adding custom animation, Using slide transitions, Graphically representing data : Charts & Graphs, Creating Professional Slide for Presentation	1
4.	Introduction to Image tools	Raster vs. Vector, Creating new images, Saving files for print, Saving files for web/screen, Working with Adobe Bridge, Using the tools, Using the options bar	2

		and other panels, Undoing actions in Photoshop, Customizing the workspace, Tools panel overview	
5.	Basic Photo Corrections	Strategy for retouching, Resolution and image size, Adjusting the color in Camera Raw, Straightening and cropping the image in Photoshop, Replacing colors in an image, Adjusting saturation with the Sponge tool, Repairing areas with the Clone Stamp tool, Using the Spot Healing Brush tool, Using content-aware fill, Applying the Unsharp Mask filter	2
6.	Working with Selections	About selecting and selection tools, Using the Quick Selection tool, Moving a selected area, Manipulating selections, Using the Magic Wand tool, Selecting with the lasso tools, Rotating a selection, Selecting with the Magnetic Lasso tool , Cropping an image and erasing within a selection ,Refining the edge of a selection,	2
7.	Layer Basics, Masks and Channels	About layers, Using the Layers panel, Rearranging layers, Applying a gradient to a layer, Applying a layer style, Flattening and saving files, Working with masks and channels, Creating a mask, Refining a mask, Creating a quick mask, Manipulating an image with Puppet Warp, Working with channels	2
8.	Typographic Design and Video tools	About type, Creating a clipping mask from type, Creating type on a path, Warping point type, Designing paragraphs of type. Video tools: OpenShot; Shotcut; Blender; Movie Maker 10; iMovie; Kapwing; KineMaster, Lightworks etc	2
		Total number of Labs	**14**

Evaluation Criteria

Components	**Maximum Marks**
Mid Term	30 (Lab Exam)
End Semester Examination	40
TA	30 (Quiz, Assignments, Tutorials)
Total	**100**

Project based learning: Each student in a group of 4-5 will apply the concepts of multimedia and utilize multimedia tools to perform various operations on the multimedia application.

Recommended Reading material:

1.	J. Lambert, F. Curtis, Microsoft Office 2019 Step by Step. Microsoft Press, 2018.
2.	L. Foulkes, Learn Microsoft Office 2019. 1st ed. Packt Publishing, 2020. Web. 25 Sept. 2021.
3.	D.W. Beskeen, C. M. Cram, L. Wermers, J. Duffy, and L. Friedrichsen, Illustrated Microsoft Office 365 & Office 2019, 2019.
4.	P. K. Andleigh, K. Thakrar, ―Multimedia Systems and Design, PHI, 2003.
5.	D. Hearn, M.P. Baker, ―Computer Graphics C Version, Pearson Education, 2003.

CO-PO-PSO Mapping:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO-CS**	**PSO-IT**	**PSO-CP**
CO1	3			2			1	1	3	2	2	2

CO2	3	1	1	2			1	1	3	2	2	2
CO3	3	1	1	2				1	3	2	2	2
CO4	3	1	1	3	2		1	1	3	3	3	3
CO5	3	1	1	3	2		1	1	3	3	3	3
CO6	3	1	1	3	2		1	1	3	3	3	3
Avg	**3**	**1**	**1**	**3**	**2**		**1**	**1**	**3**	**3**	**3**	**3**

DOS Workshop (23xxxxxxxx)

DOS course covers a broad range of topics, from basic file management and command-line navigation to advanced topics such as networking and programming. The course may also include hands-on projects and exercises to help students develop practical skills in using and managing DOS.

Course Description

Course Code	**23xxxxxxxx**	**Semester Odd**	**Semester I Session 2023-24 Month from Jul 2023 to Dec 2023**
Course Name	**DOS Workshop**		
Credits	2	**Contact Hours**	0-0-4
Faculty (Names)	**Coordinator(s)**		
	Teacher(s) (Alphabetically)		

COURSE OUTCOMES: After the successful completion of this course, the student will be able to		**COGNITIVE LEVELS**
CO1	demonstrate use of common DOS commands	Understand Level (C2)
CO2	apply DOS file utilities to perform complex tasks. Manage files and directories, file permissions, and navigate the file system	Apply Level (C3)
CO3	apply disk partitioning, formatting and error resolving	Apply Level (C3)
CO4	experiment with batch files and scripts.	Apply Level (C3)
CO5	identify and resolve common issues that may arise when using DOS.	Apply Level (C3)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures**
1.	**Introduction to DOS**	Overview of DOS history and architecture, Command-line interface basics, Navigating through the file system	4
2.	**File and directory**	Creating, copying, moving, and renaming files and directories, Deleting files and directories,	4

	management	Viewing file and directory information	
3.	**Disk management**	Managing disk partitions, Formatting disks, Checking disk status and errors	4
4.	**Batch files and scripts**	Creating and running batch files and scripts, Using variables and control structures, Automating tasks in DOS	4
5.	**External programs and utilities**	Using external programs and utilities to enhance the functionality of DOS, Installing and configuring programs	4
6.	**Advanced DOS topics**	Networking in DOS, Security in DOS, Programming in DOS	4
7.	**DOS-based applications and Troubleshooting**	DOS-based applications, such as word processors, spreadsheets, and databases. This includes identifying and resolving common issues that may arise when using DOS.	4
		Total number of Labs	**28**

Evaluation Criteria

Components	**Maximum Marks**
Mid Viva	20
End Viva	20
TA	60
Total	**100**

Project based learning: Each student in a group of 2 will apply the advanced programming concepts in DOS Environment to solve practical problems.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc.)

1.	D. Gookin, DOS for Dummies. Wiley Publishing, Inc., 2003.
2.	W. R. Stanek, Windows Command-Line Administrator's Pocket Consultant. Microsoft Press., 2011.
3.	Microsoft Corporation. Using MS-DOS 6.22. Microsoft Press., 1994.
4.	G. Chappell, DOS Internals. Addison-Wesley Professional., 1994.
5.	J. Prosise, PC Magazine DOS Power Tools. Ziff-Davis Press., 1994.
6.	R. Duncan, Advanced MS-DOS Programming. Microsoft Press., 1988.

CO-PO-PSO Mapping:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO-CS**	**PSO-IT**	**PSO-CP**
CO1	**2**	**2**	**2**	**2**	**1**		**1**	**1**	**2**	**3**	**3**	**3**

CO2	**3**	**3**	**3**	**2**	**1**		**2**	**1**	**2**	**3**	**3**	**3**
CO3	**3**	**3**	**3**	**2**	**1**		**2**	**1**	**2**	**3**	**3**	**3**
CO4	**3**	**3**	**3**	**2**	**1**		**2**	**1**	**2**	**3**	**3**	**3**
CO5	**3**	**3**	**3**	**3**	**1**		**3**	**1**	**3**	**3**	**3**	**3**
Avg	3	3	3	3	1		2	1	3	3	3	3

Introduction to Digital Technologies (23B66CS114)

Course Description

Course Code	**23B66CS114**	**Semester: Odd**	**Semester I Session 2023-24** **Month from** July 2023 –Dec 2023
Course Name	**Introduction to Digital Technologies**		
Credits	**2**	**Contact Hours**	2-0-0
	Coordinator(s)		
	Teacher(s) (Alphabetically)		

COURSE OUTCOMES: After the successful completion of this course, the student will be able to		**COGNITIVE LEVELS**
CO1	Understand the concepts of various digital technologies.	Understand Level (C2)
CO2	Explore contemporary tools and frameworks for digital technologies.	Understand Level (C2)
CO3	Apply digital technologies for a given problem.	Apply Level (C3)
CO4	Analyze a given problem to choose appropriate digital technology.	Analyze Level (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures**
1.	Artificial Intelligence and Machine Learning	Introduction to AI, ML Fundamentals, ML Algorithms, Training and Evaluation, Applications	4
2.	Data Analytics and Big Data	Introduction, Data Collection, Storage and Management, Tools and Technologies, Data Analysis Techniques, Big Data Technologies and Ecosystem, Applications and Future Trends	4
3.	Cloud, Fog and Edge Computing	Introduction, Use Cases and Applications, Real-World Implementations and Case Studies	3
4.	Internet of	Introduction, Features, Advantages and	3

	Things	Disadvantages, IoT Devices, IoT Framework, IoT Applications, IoT Development Kit	
5.	Blockchain and Cyber Security	Introduction to Blockchain Technology, Blockchain Security and Vulnerabilities, Cryptographic Foundations for Blockchain Security, Integrating Blockchain with Cybersecurity, Future Trends and Challenges	4
6.	Augmented Reality and Virtual Reality, UI, UX	Introduction to Augmented Reality and Virtual Reality, UI and UX Design for AR and VR, Designing Interactions and Gestures in AR and VR, AR and VR Accessibility and Inclusivity, Design Challenges and Future Trends in AR and VR	3
7.	Robotic Automation and Smart Cities	Introduction, Robotic Automation in Smart Cities, Challenges and Opportunities in Smart Cities	4
8.	Brain Computer Interface	Introduction, BCI Technologies and Modalities, Signal Processing and Machine Learning for BCI, BCI Applications in Assistive Technology, BCI in Gaming and Virtual Reality	3
		Total Number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
Mid Term	30 (Lab Exam)
End Semester Examination	40
TA	30 (Quiz, Assignments, Tutorials)
Total	**100**

Project based learning: Each student in a group of 3-4 will solve a real-world application using the digital technologies. They will give a practical demonstration of the problem and its solution which will help their employability into IT sector.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Foster Provost and Tom Fawcett. Data Science for Business. O'Reilly Media, Inc, 2013.
2.	Hyatt Saleh. Machine Learning Fundamentals. Packt Publishing, 2018.
3.	Vecchiola, Christian., Selvi, S.Thamarai., Buyya, Rajkumar. Mastering Cloud Computing: Foundations and Applications Programming. Netherlands, Elsevier Science, 2013.
4.	Vijay Madisetti, ArshdeepBahga, Ïnternet of Things, "A Hands on Approach", University Press, 2015.
5.	A. T. Choudhari, A. S. Ariff, and S. M. R., Blockchain for Enterprise Application Developers. NJ: Wiley, 2020.

CO-PO-PSO Mapping:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO-CS**	**PSO-IT**	**PSO-CP**
CO1	1								1	1	1	
CO2	1			2					2	2	2	

CO3	2		2	3	2		2	2	3	3	3	
CO4	2	3		3	2		2	2	3	3	3	
Avg	**1.5**	**3**	**2**	**2.67**	**2**		**2**	**2**	**2.25**	**2.25**	**2.25**	