

**SEMESTER I**  
**MAJOR COURSE**

To be effective from year-2024



COURSE TITLE: Problem Solving with C						
Course Code:		IMDAMJPC0124			Examination Scheme	
Total number of Lecture Hours: 56					External	80
					Internal	20
Lecture(L):	3	Practicals (P):	1	Tutorial(T):	0	Total Credits
4						
<b>Course Objectives:</b> <ul style="list-style-type: none"> <li>To understand basic programming concepts and principles.</li> <li>To develop problem-solving skills through algorithm design and implementation.</li> <li>To apply debugging and testing techniques to ensure code correctness.</li> <li>To implement solutions to various computational problems using C.</li> </ul>						
Course Content						TEACHING HOURS
UNIT1: Introduction to C Programming						-Hrs
Introduction to Problem Solving through programs, Overview of C programming language. Setting up the Development Environment. Flowcharts/Pseudocodes, the compilation process, Introduction to Syntax and Semantic errors. Writing and running a basic C program.						14
UNIT2: Basic Programming Constructs						-Hrs
Variables and Data Types. Arithmetic expressions, Relational Operations, Logical expressions; Control Structures. Defining and calling functions. Recursion. 2-D arrays, Character Arrays and Strings. Basics of pointers. Dynamic memory allocation. Definition and use of structures. Reading from and writing to files. File operations (open, close, read, write)						14
UNIT3: Algorithms and Computational Methods						-Hrs
Introduction to algorithms and algorithmic thinking. Computational methods for problem solving: searching, sorting, optimization algorithms. Understanding algorithm complexity. Implementing algorithms in a C programming language. Common debugging techniques Using debugging tools. Writing test cases and validating code.						14

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Textbooks
<ol style="list-style-type: none"> <li>1. Behrouz A. Forouzan, and Richard F. Gilberg. "C Programming: A Structured Approach Using C." 3rd ed., Cengage Learning, 2019.</li> <li>2. King, Carey. "C Programming: A Modern Approach." 2nd ed., W.W. Norton &amp; Company, 2008.</li> <li>3. Gaddis, Tony. "Starting Out with C: From Control Structures through Objects." 4th ed., Pearson, 2019.</li> </ol>
Reference Books
<ol style="list-style-type: none"> <li>1. Balagurusamy, E. "Programming in ANSI C." 7th ed., Tata McGraw-Hill, 2020.</li> <li>2. Deitel, Paul, and Harvey Deitel. "C: How to Program." 8th ed., Pearson, 2016.</li> <li>3. • Kochan, Stephen G. "Programming in C." 4th ed., Addison-Wesley, 2022.</li> </ol>
Lab Manual-Problem Solving with C IMDAMJPC0124
<ol style="list-style-type: none"> <li>1. Write a C program to check whether a given number is prime or not.</li> <li>2. Write a program that determines if a given number is positive, negative, or zero.</li> <li>3. Implement basic arithmetic operations and display results.</li> <li>4. Write a program to print numbers from 1 to 100 using for, while, and do-while loops.</li> <li>5. Create a multiplication table using nested loops.</li> <li>6. Write a C program to generate the Fibonacci series.</li> <li>7. Write a program that reverses the contents of a string.</li> <li>8. Implement recursive functions for tasks such as calculating factorial, generating Fibonacci numbers, and solving the Tower of Hanoi problem.</li> <li>9. Write a program to find the largest and smallest elements in an array.</li> <li>10. Write a program to demonstrate pointer usage (e.g., pointer arithmetic, passing pointers to functions).</li> <li>11. Create a structure to store student information (e.g., name, roll number, grades) and implement functions to manipulate this data.</li> <li>12. Write a program to read from and write to a file.</li> <li>13. Write programs to perform bubble sort and binary search on arrays.</li> <li>14. Write programs with intentional errors and debug those using provided tools.</li> </ol>
COURSEOUTCOMES(CO):
<p><b>CO1:</b> Understanding of the fundamental structure of a C program, including syntax, data types, and operators.</p> <p><b>CO2:</b> Write and compile simple C programs, correctly using basic language constructs.</p> <p><b>CO3:</b> Implement basic algorithms for sorting and searching and analyze the complexity of these algorithms to evaluate their efficiency.</p> <p><b>CO4:</b> Write and execute test cases to validate the correctness and functionality of code.</p>

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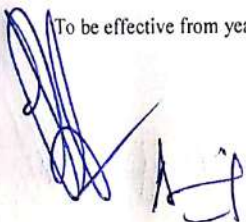
LEVEL OF CO-PO MAPPING TABLE												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
	2	1	1	1	2	1	1	1	1	1	1	1
1	2	1	1	1	2	1	1	1	2	2	1	2
2	2	2	2	1	2	1	1	1	2	2	2	2
3	3	2	2	2	3	1	1	1	2	2	2	2
4	1	2	2	3	2	1	1	2	3	3	1	3

To be effective from year-2024



## MINOR COURSE

To be effective from year-2024



COURSE TITLE: Internet Of Things							
Course Code:		IMDAMNIT0124			Examination Scheme		
Total number of Lecture Hours: 56					External		80
					Internal		20
Lecture(L):	4	Practicals (P):	-	Tutorial(T):	-	Total Credits	4
<p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>• Introduce students to the basic principles and architecture of the Internet of Things (IoT).</li> <li>• Familiarize students with the key components and communication protocols used in IoT systems.</li> <li>• Explore various practical applications of IoT across different domains, including smart homes, healthcare, and industry.</li> <li>• Examine the challenges, ethical considerations, and future trends in IoT technology.</li> </ul>							
<b>Course Content</b>						<b>TEACHING HOURS</b>	
<b>UNIT 1: Introduction to IoT</b>						<b>14 Hrs</b>	
<p>Introduction to IoT: Definition and basic concept of IoT, Evolution and importance of IoT in various domains (e.g., healthcare, smart cities, agriculture)</p> <p>Key Components of IoT: Sensors and actuators: Types and functionalities, IoT devices: Overview of different types (e.g., wearables, smart home devices), Communication protocols: Overview of MQTT, CoAP, HTTP, etc.</p> <p>IoT Architecture: Overview of IoT architecture layers (perception, network, application), Cloud computing and edge computing in IoT, IoT platforms: Examples and their roles in IoT deployments</p>							
<b>UNIT 2: Applications and Challenges of IoT</b>						<b>14 Hrs</b>	
<p>IoT Applications: Smart home systems: Examples and functionalities (e.g., home automation, security systems), Healthcare IoT: Remote patient monitoring, smart medical devices, Industrial IoT (IIoT): Industry 4.0 concepts, smart factories</p> <p>Challenges and Considerations: Security and privacy issues in IoT: Threats and mitigation strategies, Scalability and interoperability challenges, Ethical considerations and societal impacts of IoT</p> <p>Future Trends in IoT: Emerging technologies influencing IoT (e.g., AI, blockchain), Predictions for the future of IoT: Opportunities and challenges</p>							

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<b>UNIT 3: IoT Architecture and Real-World Design Constraints</b>	<b>14 hrs</b>
IoT Architecture Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. Real-World Design Constraints- Introduction, Technical Design constraints- hardware is popular again Data representation and visualization, Interaction and remote control. Industrial Automation- Service oriented architecture-based device integration, SOCRADES: realizing the enterprise integrated Web of Things, IMC-AESOP: from the Web of Things to the Cloud of Things	
<b>UNIT 4 : Internet of Things with Arduino: Connectivity, Sensor Interaction, and Cloud Integration</b>	<b>14 hrs</b>
Internet of Things with Arduino Setting up the Arduino development environment: Options for Internet connectivity, Interacting with basic sensors, Interacting with basic actuators, Configuring Arduino for the IoT Grabbing the content from a web page, Sending data to the cloud, Monitoring sensor data from a cloud dashboard, Monitoring several Arduino boards at, Storing data on Google Drive, Basic local M2M interactions, Cloud M2M with IFTTT; Case Study: IoT based Flood Monitoring and Alert System	
<b>Textbooks</b>	
<ul style="list-style-type: none"> <li>• Internet of Things: Principles and Paradigms by Rajkumar Buyya, Amir Vahid Dastjerdi, and Sriram Illikkal, 1st Edition, 2016.</li> <li>• Schwartz, Marco. Internet of Things with Arduino Cookbook, Packt Publishing Ltd, 1st Edition, 2016.</li> <li>• Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence, 1st Edition, 2014, Academic Press. (ISBN-13: 978-0124076846).</li> </ul>	
<b>Reference Books</b>	
<ul style="list-style-type: none"> <li>• Vijay Madiseti and ArshdeepBahga, "Internet of Things (A Hands-on-Approach)", 1stEdition, VPT, 2014. (ISBN-13: 978-8173719547)</li> <li>• Schwartz, Marco. "Internet of Things with Arduino Cookbook." Packt Publishing Ltd, 1st Edition, 2016.</li> </ul>	
<b>COURSEOUTCOMES(CO):</b>	
<p><b>CO1: Grasp the fundamental concepts and architecture of IoT and its significance in modern technology.</b></p> <p><b>CO2: Identify and explain the key components and communication protocols essential for IoT systems.</b></p> <p><b>CO3: Analyze and describe practical applications of IoT across various sectors, including smart homes, healthcare, and industry.</b></p>	

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**CO4: Evaluate the challenges and future trends in IoT, including security, privacy, and emerging technologies.**

**LEVEL OF CO-PO MAPPING TABLE**

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	2	1	2	2	2	2	-	1	1	2
2	3	3	3	2	3	2	2	1	1	2	1	2
3	2	3	3	2	2	3	3	2	2	3	2	2
4	2	2	2	2	2	2	2	3	2	3	2	3

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## ABILITY ENHANCEMENT COURSES (AEC)

One 3-Credit AEC Course to be opted from  
centrally organized Basket of courses for  
FYIMP under NEP 2020

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## MULTIDISCIPLINARY COURSES (MDC)

One 3-Credit MDC Course to be opted from  
centrally organized Basket of courses for  
FYIMP under NEP 2020  
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# VALUE ADDED COURSES

One 2-Credit VAC1 Course to be opted from  
centrally organized Basket of courses for  
FYIMP under NEP 2020  
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**One 2-Credit VAC2 Course to be opted from  
centrally organized Basket of courses for  
FYIMP under NEP 2020  
IMDAVXXXX23**

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## SKILL ENHANCEMENT COURSE (SEC)

To be effective from year-2024

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COURSE TITLE: Principles of Management						
Course Code:		IMDASEPM0124			Examination Scheme	
Total number of Lecture Hours: 28					External	40
					Internal	10
Lecture(L):	2	Practicals (P):	0	Tutorial(T):	0	Total Credits
2						
<b>Course Objectives</b> <ul style="list-style-type: none"> <li>The purpose of this course is to introduce the student to the roles and responsibilities of managers in organizations.</li> <li>The course will emphasize experiential learning and self-inquiry to explore the job of a manager, including the managerial environment, the five functions of management (planning, organizing, leading, staffing, and controlling), decision-making, effective communications, and management ethics.</li> </ul>						
<b>Course Content</b>					<b>TEACHING HOURS</b>	
<b>UNIT1:</b>					<b>- Hrs</b>	
Nature, Meaning, and Significance of Management, Managerial functions, Principles of Management, Evolution of Management Thoughts-Traditional, Behavioral, Systems, Contingency and Quality viewpoints. Contemporary management practices, Managing in a global environment. Japanese approach to management.					14	
<b>UNIT2:</b>					<b>-Hrs</b>	
Nature & Elements of Planning, Planning types and Models, Planning in learning organizations; Decision-making styles; Process of decision making. Management by Objectives (MBO), SWOT Analysis.					14	

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**Textbooks**

1. Robbins, Stephen P., and Mary Coulter. "Management." 13th ed., Pearson, 2019.
2. Daft, Richard L. "Management." 12th ed., Cengage Learning, 2021.
3. Bateman, Thomas S., and Scott Snell. "Management: Leading & Collaborating in a Competitive World." 13th ed., McGraw-Hill Education, 2022.

**Reference Books**

1. Mintzberg, Henry. "Managing." 1st ed., Berrett-Koehler Publishers, 2009.
2. Koontz, Harold, and Heinz Weihrich. "Essentials of Management: An International Perspective." 10th ed., Tata McGraw-Hill, 2015.
3. Griffin, Ricky W. "Management." 13th ed., Cengage Learning, 2020.

**COURSE OUTCOMES(CO):**

CO1: Examine the functions of planning, organizing, leading, staffing, and controlling.  
 CO2: Evaluate and anticipate the potential effectiveness of various management styles, communications, and decisions for a given situation.

**LEVEL OF CO-POMAPPING TABLE**

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	2	2	1	2	1	1	2	2	3	2
2	1	2	2	2	1	2	1	1	2	2	3	2

To be effective from year-2024

**SEMESTER II**  
**MAJORCOURSE**

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COURSE TITLE: Python Programming							
Course Code: IMDAMJPP0224				Examination Scheme		T	P
Total number of Lecture Hours: 56				External		80	-
Total number of Practical Hours:-				Internal		20	-
Lecture(L):	3	Practical(P):	1	Tutorial(T):	0	Total Credits	
						4	
<b>Course Objectives</b>							
<ul style="list-style-type: none"> <li>Students will understand and apply Python variables, operators, data types, and control structures to create basic programs. They will gain the ability to manage program flow using conditional blocks and loops.</li> <li>Students will learn to effectively use and manipulate Python data structures, including strings, lists, tuples, and dictionaries. They will also practice slicing and looping techniques for efficient data handling.</li> <li>Students will acquire skills in organizing Python code into functions, modules, and packages. They will explore the use of external modules and packages, and apply these techniques to create well-structured and reusable Python projects.</li> </ul>							
<b>Course Content</b>						<b>TEACHING HOURS</b>	
<b>UNIT1:Python Basics:Variables and Data Types</b>						<b>-Hrs.</b>	
Overview of Python and its application. Setting up the Python environment (Anaconda, Jupyter Notebook, etc.). Understanding Python variables, Python basic operators, Python blocks, data types, declaring and using numeric data types: int, float, complex. Using string data type and string operations.						14	
<b>UNIT2:Control Structures in Python</b>						<b>-Hrs.</b>	
Python program flow control: Conditional blocks using if, else, and elif. Simple for loops in Python, for loop using ranges.  String, list, tuples, sets, and dictionaries. Use of while loops in Python. Loop manipulation using pass, continue, break, and else. Programming using Python conditional and loops block.						14	
<b>UNIT3:Python Functions, Modules, and Packages</b>						<b>-Hrs</b>	
Python functions, modules, and packages. Organizing Python code using functions. Introduction to classes and objects. Organizing Python projects into modules, importing own module as well as external modules.  Understanding packages, powerful lambda function in Python. Programming using functions, modules, and external packages. File handling: reading from and writing to files. Working with different file formats.						14	
<b>Textbooks</b>							

1. Kenneth A. Lambert, "The Fundamentals of Python: First Programs," Cengage Learning, ISBN: 978-1111822705, 1st Edition (2011).
2. • David Beazley, Brian K. Jones, "Python Cookbook," O'Reilly Publications, 3rd Edition (2013).

#### Reference Books

1. Jake VanderPlas, "Python Data Science Handbook," O'Reilly Publications, 1st Edition (2016).
2. David Beazley, "Python Essential Reference (4th Edition)," Addison Wesley, 4th Edition (2009).
3. • Vernon L. Ceder, "The Quick Python Book, Second Edition," Manning Publications, 3rd Edition (2018).

#### Lab Manual-Python Programming IMDAMJPP0224

##### Week 1:

1. Install Python and set up IDEs like Jupyter Notebook or VS Code.
2. Write a "Hello, World!" program.

##### Week 2:

1. Write a program to perform basic arithmetic operations: addition, subtraction, multiplication, and division.
2. Write a program to print your name and age.

##### Week 3:

1. Write a program to create variables of different data types (int, float, complex, string) and print their values.
2. Write a program to perform string operations: concatenation, slicing, and repetition.

##### Week 4:

1. Write a program to find the length, maximum, and minimum value of a list.
2. Write a program to demonstrate the use of if, else, and elif statements.

##### Week 5:

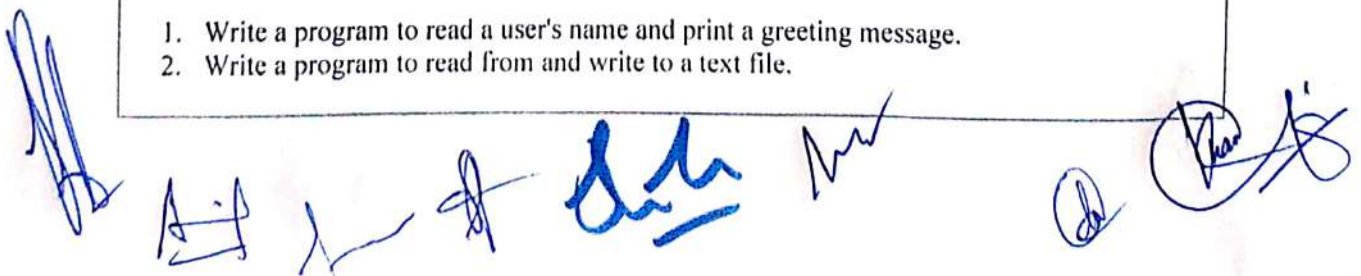
1. Write a program to print the first 10 natural numbers using a for loop.
2. Write a program to print a pattern using nested loops (e.g., a pyramid).

##### Week 6:

1. Write a program to iterate over a string, list, and dictionary using loops.
2. Write a program to demonstrate the use of while loops.

##### Week 7:

1. Write a program to read a user's name and print a greeting message.
2. Write a program to read from and write to a text file.



**Week 8:**

1. Write a program to take multiple inputs from the user and print them.
2. Write a program to define and call a function that adds two numbers.

**Week 9:**

1. Write a program to demonstrate the use of lambda functions.
2. Write a program with a function that takes a list as an argument and returns the sum of all its elements.

**Week 10:**

1. Write a program to create and import a custom module.
2. Write a program to use an external library (e.g., math or random).

**Week 11:**

1. Write a program to organize code into a package.
2. Write a program to read and write to a file using different modes.

**Week 12:**

1. Write a program to handle exceptions using try, except, and finally blocks.
2. Write a program to create a directory, write a file in it, and handle any exceptions that occur.

**Week 13:**

1. Write a program to define a class and create objects.
2. Write a program to demonstrate inheritance.

**Week 14:**

1. Write a program to find all occurrences of a pattern in a string using regular expressions.
2. Write a program to validate an email address using regular expressions.



**COURSEOUTCOMES(CO):**

**CO1:** Students will be able to write Python programs that effectively utilize variables, operators, and data types, while employing control structures such as conditional statements and loops to solve computational problems.

**CO2:** Students will show proficiency in creating and manipulating Python data structures, including strings, lists, tuples, and dictionaries. They will be able to use slicing and looping techniques to efficiently handle data.

**CO3:** Students will be capable of organizing Python code into functions, modules, and packages. They will demonstrate the ability to import and use external modules, and apply these skills in developing organized, modular, and reusable Python projects.

**LEVELOFECO-POMAPPINGTABLE**

Cos	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	-	-	3	-	-	-	2	-	-	3
2	3	3	-	-	3	-	-	-	-	-	-	2
3	2	2	3	-	3	-	-	-	2	-	2	-

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## MINOR COURSE

To be effective from year-2024



COURSE TITLE: Programming with R							
Course Code:		IMDAMNPR0224			Examination Scheme		
Total number of Lecture Hours: 56					External	80	
					Internal	20	
Lecture(L):	4	Practicals (P):	0	Tutorial(T):	0	Total Credits	4
<p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>To introduce students to the basics of programming using the R language, including variables, data types, control structures, and functions.</li> <li>To teach students how to manipulate and analyze data using R, including importing data, data cleaning, summarizing data, and creating basic visualizations.</li> <li>To familiarize students with conducting basic statistical analyses such as hypothesis testing, regression analysis, and descriptive statistics using R.</li> <li>To make students learn how to document their analysis workflow, integrate code with explanatory text, and generate reports that can be easily reproduced and shared with others.</li> </ul>							
<b>Course Content</b>						<b>TEACHING HOURS</b>	
<b>UNIT1: Introduction to R</b>						<b>-Hrs</b>	
Overview of R and R-studio. Basics of R programming: variables, data types operators. Control structures: if-else, loops. Functions in R: defining functions commonly used mathematical functions, commonly used string functions. User-defined functions, local and global variables.						14	
<b>UNIT2: Data Handling in R</b>						<b>-Hrs</b>	
Data structures in R: vectors, matrices, data frames, lists. Importing and exporting data. Importing data from Excel. Accessing databases. Saving in R data. Loading R data objects. Writing to files. Data cleaning and preparation: handling missing values, filtering data.						14	
<b>UNIT3: Data Manipulation</b>						<b>-Hrs</b>	
Data manipulation techniques: Selecting rows/observations. Selecting columns/fields. Merging data. Relabeling the column names. Reshaping the data. Centering, scaling, and normalizing the data values. Converting variable types. Data sorting. Data aggregation.						14	
<b>UNIT4: Basic Statistical Analysis</b>						<b>-Hrs</b>	

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Introduction to statistical inference: hypothesis testing (t-tests, chi-square tests). Regression analysis. Creating plots using ggplot2: scatter plots, histograms, bar plots. Customizing plots: adding titles, labels, legends, colors and themes. Exploratory data analysis with visualization techniques. Creating reproducible reports: generating HTML, PDF, or Word documents.

14

**Textbooks**

1. Crawley, Michael J. "The R Book." 3rd ed., Wiley, 2021.
2. Peng, Roger D., and Jeffrey P. Leek. "Statistics Programming in R." 1st ed., O'Reilly Media, 2021.

**Reference Books**

1. Wickham, Hadley. "R for Data Science: Import, Tidy, Transform, Visualize, and Model Data." 2nd ed., O'Reilly Media, 2022.
2. Grolemund, Garrett, and Hadley Wickham. "Hands-On Programming with R." 1st ed., O'Reilly Media, 2016.
3. • VanderPlas, Jake. "Python Data Science Handbook: Essential Tools for Working with Data." 1st ed., O'Reilly Media, 2016.

**COURSEOUTCOMES(CO):**

**CO1:** Write R programs to solve computational problems, utilizing variables, loops, conditionals, and functions effectively.

**CO2:** Import, clean, manipulate, and visualize data using R, demonstrating proficiency in data handling techniques.

**CO3:** Perform basic statistical analyses including hypothesis testing and regression analysis, and interpret statistical results in the context of research questions or real-world problems.

**CO4:** Produce well-documented and reproducible reports, integrating code, visualizations, and explanations to communicate findings effectively.

**LEVELOFCO-POMAPPINGTABLE**

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	2	1	2	1	1	1	1	2	1	2
2	3	2	2	2	3	1	1	1	2	2	1	2
3	3	3	2	2	3	2	1	2	2	2	2	2
4	2	2	2	2	2	2	1	2	2	3	2	3

To be effective from year-2024

## ABILITY ENHANCEMENT COURSES (AEC)

One 3-Credit AEC Course to be opted from  
centrally organized Basket of courses for  
FYIMP under NEP 2020  
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# MULTIDISCIPLINARY COURSES (MDC)

One 3-Credit MDC Course to be opted from

centrally organized Basket of courses for

FYIMP under NEP 2020

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# VALUE ADDED COURSES (VAC)

One 2-Credit VAC1 Course to be opted from

centrally organized Basket of courses for

FYIMP under NEP 2020

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**One 2-Credit VAC2 Course to be opted from  
centrally organized Basket of courses for  
FYIMP under NEP 2020**

**IMDAVAXXX23**

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## SKILL ENHANCEMENT COURSES (SEC)

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COURSE TITLE: Latex						
Course Code: IMDASELT0224				Examination Scheme	T	P
Total number of Lecture Hours: 28				External	40	-
Total number of Practical Hours:-				Internal	10	-
Lecture(L):	2	Practical(P):	0	Tutorial(T):	0	Total Credits
						2
<b>Course Objectives</b>						
<ul style="list-style-type: none"> <li>• To introduce the fundamental concepts and features of LaTeX, including document structure, typesetting, and managing bibliographic databases.</li> <li>• To equip students with the skills to effectively manage advanced document formatting in LaTeX, including tables, lists, and floating elements like figures and tables.</li> <li>• To provide students with practical knowledge on typesetting complex mathematical expressions, theorems, and cross-referencing techniques in LaTeX.</li> <li>• To develop proficiency in using advanced LaTeX tools for document management, including footnotes, margin notes, custom boxes, and glossary creation.</li> </ul>						
<b>Course Content</b>					<b>TEACHING HOURS</b>	
<b>UNIT1: Document Structure, Bibliography, and Formatting in LaTeX</b>					<b>Hrs.</b>	
Introduction to LaTeX: What is LaTeX? Overview of simple typesetting, fonts, and type sizes. Document Structure: Document class, page style, page numbering, formatting lengths, and organizing parts of a document. Dividing and Managing Documents: Handling sections, subsections, and document divisions. Bibliography and References: Introduction to bibliography management, the natbib package, and creating a bibliographic database. BIBTEX: Using the BIBTEX program, BIBTEX style files, and managing bibliographic databases. Table of Contents, Index, and Glossary: Creating a table of contents, generating an index, and adding glossaries.					14	
<b>UNIT2: Advanced Typesetting, Mathematics, and Referencing in LaTeX.</b>					<b>Hrs.</b>	
Displayed Text: Handling borrowed words, poetry in typesetting, lists (ordered and unordered), and descriptions.  Rows, Columns, and Tables: Managing tabs and creating complex tables. Mathematical Typesetting: The basics of typesetting mathematics, creating custom commands and new operators, using mathematical symbols, and theorems. Typesetting Theorems: Creating and formatting theorems in LaTeX. Box Handling in LaTeX: Working with LR boxes, paragraph boxes, nested boxes, and rule boxes.  Floating Environments: Using the figure and table environments for handling floats. Cross-Referencing: Implementing cross-references within and across documents using varioref, xr, and lablst packages. Footnotes, Margin pars, and Endnotes: Managing footnotes, margin notes, and endnotes in a document.					14	
<b>Textbooks</b>						

Handwritten signatures and initials in blue ink at the bottom of the page.

1. Leslie Lamport. "LaTeX: A Document Preparation System." 2nd ed., Addison-Wesley, 1994.
2. Mittelbach, Frank, and Michel Goossens. "The LaTeX Companion." 2nd ed., Addison-Wesley, 2004.

**Reference Books**

1. Goossens, Michel, et al. "The LaTeX Graphics Companion." 2nd ed., Addison-Wesley, 2007.
2. Pape, David. "LaTeX: A Complete Guide." 1st ed., Apress, 2021.
3. Raghunathan, K. S. "Getting Started with LaTeX: A Beginner's Guide." 1st ed., Springer, 2020.

**COURSE OUTCOMES(CO):**

**CO1:** Understand and apply the basics of LaTeX for creating well-structured documents, including managing document classes, page styles, and bibliography using BIBTEX.

**CO2:** Create and organize comprehensive tables of contents, indexes, glossaries, and utilize LaTeX's advanced formatting tools like lists, tables, and custom fonts.

**CO3:** Typeset and format complex mathematical expressions, theorems, and symbols in LaTeX while creating custom commands and operators.

**CO4:** Use floating elements such as figures and tables effectively, cross-reference documents accurately, and handle footnotes, margin notes, and endnotes within LaTeX.

**CO5:** Employ advanced LaTeX features such as creating nested and rule boxes, and manage complex documents efficiently while adhering to best practices in typesetting.

**LEVEL OF CO-POMAPPING TABLE**

Cos	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												