PUNYASHLOK AHILYADEVI HOLKAR SO

LAPUR UNIVERSITY, SOLAPUR

SKILL DEVELOPMENT CENTRE

पुण्यश्लोक अहिल्यादेवी होळकर
सोलापूर विद्यापीठ
।। विद्यया संपन्नता ।।

Course Name:

Certificate Course in MATLAB Software

Year- 2023

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

SKILL DEVELOPMENT CENTRE

Course Name: Certificate Course in MATLAB Software

Syllabus

Duration of course: 6 Month

The main objectives are:

- Understanding the MATLAB environment
- Being able to do simple calculations using MATLAB
- Being able to carry out simple numerical computations and analyses using MATLAB

Upon successful completion of this course, the student should be able to:

- Understand the main features of the MATLAB development environment
- Use the MATLAB GUI effectively
- Design simple algorithms to solve problems
- Write simple programs in MATLAB to solve scientific and mathematical problems

Tentative Fees: Rs. 8000/-

Minimum Admission Eligibility for Student: Graduate in any discipline.

Teacher's Eligibility: M. Sc (Computer. Science) / MCA / BE (CSE)

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SKILL DEVELOPMENT CENTRE

Syllabus Structure

Course Title : "Certificate Course in MATLAB Software"

Course Duration: 6 Months

Name of Skill Course	Duration	Name of Paper	Paper	Hours Per Paper	Th.	Int.	Pract.	Credits
Certificate Course in MATLAB Software	6 Months	Introduction to Programming Using MATLAB	I	45	80	20	00	3 Credits
		Programming in MATLAB	II	45	80	20	00	3 Credits
		MATRIX in MATLAB	III	45	80	20	00	3 Credits
		Practical Paper	IV	90	00	00	100	3 Credits
Total				**225**	**240**	**60**	**100**	**12 Credits**

Abbreviations:
Th.- Theory Evaluation,
Int.- Internal Evalution,
Pract.- Practical Evolution.

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SKILL DEVELOPMENT CENTRE

Course Title: Certificate Course in MATLAB Software

SYLLABUS Details

1)	Paper Title	**Introduction to Programming Using MATLAB**	
2)	Paper No	I	
3)	Objectives of Paper	To Learn Installing MATLAB	
		To Learn Basic Concept of MATLAB	
		To Study Characteristics of MATLAB Programming	
4)	Expected out comes from Paper	Learn a skill of Installing MATLAB	
		Learn a Implementing Basic Programing Operations using MATLAB	
		Learn a Skill to handle syntactical errors.	
5)	**Content**		
	Unite-1	Introduction about MATLAB, MATLAB's Power of Computational Mathematics, Features of MATLAB Uses of MATLAB, Getting and Installing MATLAB Understanding the MATLAB Environment, MATLAB as simple Calculator, Alternate MATLAB Platforms	08 Hour
	Unite-2	MATLAB Basic: Syntax Basics, Variables and Assignment Statements, Numerical Expressions, Characters and Strings, Relational Expressions, Type Ranges and Type Casting, Built-in Numerical	12 Hour
	Unite-3	Functions, Use of Semicolon (;) in MATLAB, Adding Comments, commonly used Operators and Special Characters, Special Variables and Constants, Naming Variables, VARIABLES, Multiple Assignments, INPUT AND OUTPUT, MATLAB Scripts	10 Hour
	Unite-4	DATA TYPES: Data Types Available in MATLAB, Data Type Conversion OPERATORS: Arithmetic Operators, Relational Operators, Logical Operators, Bitwise Operations Set Operations.	15 Hour

6)	Reference Book	Books: 1. MATLAB A Practical Introduction to Programming, and Problem Solving, Fifth Edition, Stormy Attaway, Butterworth-Heinemann is an imprint of Elsevier 2. Programming with MATLAB for Scientists A Beginner's Introduction, Eugeniy E. Mikhailov, CRC Press 3. "A Guide to MATLAB - for Beginners and Experienced Users", 2nd Ed., Brian R. Hunt, Ronald L. Lipsman, Jonathan M. Rosenberg, Cambridge University Press, (2006). 4. "Essentials of MATLAB Programming", 2nd Ed., Stephen J. Chapman, Cengage Learning, (2009).

Course Title: Certificate Course in MATLAB Software

SYLLABUS Details

1)	Paper Title	**Programming in MATLAB**	
2)	Paper No	II	
3)	Objectives of Paper	To Learn Decision Making Statements	
		To Study Loop Type Statements	
		To Understand the concepts of Vectors	
4)	Expected out comes from Paper	Skill to write program using Decision Making Statements	
		Skill to implement Iterative statement using Looping Statements	
		Skill to operate vectors and related programing in MATLAB	
5)	**Content**		
	Unite-1	Decision Making: if... end Statement, if...else...end Statement, if...elseif...elseif...else...end Statements,	15 Hour
	Unite-2	The Nested if Statements, The switch Statement, The Nested Switch Statements	05 Hour
	Unite-3	LOOP TYPES: The while Loop, The for Loop, The Nested Loops, Loop Control Statements, the break Statement, the continue Statement	15 Hour
	Unite-4	VECTORS: Row Vectors, Column Vectors, Referencing the Elements of a Vector, Vector Operations, Addition and Subtraction of Vectors, Scalar Multiplication of Vectors, Transpose of a Vector, Appending Vectors, Magnitude of a Vector, Vector Dot Product, Vectors with Uniformly Spaced Elements.	10 Hour
6)	Reference Book	Books: 1. MATLAB A Practical Introduction to Programming,and Problem Solving, Fifth Edition, Stormy Attaway,Butterworth-Heinemann is an imprint of Elsevier 2. Programming with MATLAB for ScientistsA Beginner's Introduction, Eugeniy E. Mikhailov, CRC Press 3. "A Guide to MATLAB - for Beginners and Experienced Users", 2nd Ed., Brian R. Hunt, Ronald L. Lipsman, Jonathan M. Rosenberg, Cambridge University Press, (2006). 4. "Essentials of MATLAB Programming", 2nd Ed., Stephen J. Chapman, Cengage Learning, (2009).	

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SYLLABUS Details

1)	Paper Title	**MATRIX in MATLAB**	
2)	Paper No	III	
3)	Objectives of Paper	To Learn Matrix Operations with real time data	
		To understand concept of Array and Function for programming	
		To Learn various Data Plotting types for Result generation	
4)	Expected out comes from Paper	Skill to do Matrix Operations of real time data	
		Skill to efficiently use Arrays and Function for better programming	
		Skill to integrate plotting of data points for data presentation	
5)	**Content**		
	Unite-1	Referencing the Elements of a Matrix, Deleting a Row or a Column in a Matrix Matrix Operations: Addition and Subtraction of Matrices, Division (Left, Right) of Matrix, Scalar Operations of Matrices, Transpose of a Matrix, Concatenating Matrices, Matrix Multiplication, Determinant of a Matrix, Inverse of a Matrix	08 Hour
	Unite-2	ARRAYS: Special Arrays in MATLAB, A Magic Square, Multidimensional Arrays, Array Functions, Sorting Arrays, Cell Array, Accessing Data in Cell Arrays	12 Hour
	Unite-3	FUNCTIONS: User Defined Functions, Anonymous Functions, Nested Functions, Private Functions Global Variables	10 Hour
	Unite-4	PLOTTING: Adding Title, Labels, Grid Lines, and Scaling on the Graph, Drawing Multiple Functions on the Same Graph, Setting Colors on Graph, Setting Axis Scales, Generating Sub-Plots, Basic 2D, 3D plots, Drawing Contours, Three-Dimensional Plots	15 Hour
6)	Reference Book	Books: 1. MATLAB A Practical Introduction to Programming,and Problem Solving, Fifth Edition, Stormy Attaway,Butterworth-Heinemann is an imprint of Elsevier 2. Programming with MATLAB for ScientistsA Beginner's Introduction, Eugeniy E. Mikhailov, CRC Press 3. "A Guide to MATLAB - for Beginners and Experienced Users", 2nd Ed., Brian R. Hunt, Ronald L. Lipsman, Jonathan M. Rosenberg, Cambridge University Press, (2006). 4. "Essentials of MATLAB Programming", 2nd Ed., Stephen J. Chapman, Cengage Learning, (2009).	

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SYLLABUS Details

1)	Paper Title	**Practical Paper**	
2)	Paper No	IV	
3)	Objectives of Paper	Understand writing program using MATLAB	
		To Learn theory based practical concept implementation	
		To Learn various MATLAB function for output generation	
4)	Expected out comes from Paper	Writing MATLAB file and programs with proficient skill	
		Implementing theory based practical concept for better understanding	
		Skill to integrate real time problem-based project implementation	
5)	**Content**		
	Unite-1	**Introduction to Programming Using MATLAB** MATLAB Basic: Numerical Expressions, Built-in Numerical Functions, Adding Comments, commonly used Operators MATLAB Scripts	08 Hour
	Unite-2	Programming in MATLAB • Use of Decision-Making Statements. • Use of LOOP TYPES and the break Statement, the continue Statement. • VECTORS and its various Operations.	15 Hour
	Unite-3	MATRIX in MATLAB • Matrix and its Operations. • ARRAYS in MATLAB. • Functions, Sorting Arrays, Cell Array, Accessing Data in Cell Arrays	12 Hour
	Unite-4	PLOTTING Adding Title, Labels, Grid Lines, and Scaling on the Graph, Drawing Multiple Functions on the Same Graph, Setting Colors on Graph, Setting Axis Scales, Generating Sub-Plots, Basic 2D, 3D plots, Drawing Contours, Three-Dimensional Plots	10 Hour

6)	Reference Book	Books: 1. MATLAB A Practical Introduction to Programming,and Problem Solving, Fifth Edition, Stormy Attaway,Butterworth-Heinemann is an imprint of Elsevier 2. Programming with MATLAB for ScientistsA Beginner's Introduction, Eugeniy E. Mikhailov, CRC Press 3. "A Guide to MATLAB - for Beginners and Experienced Users", 2nd Ed., Brian R. Hunt, Ronald L. Lipsman, Jonathan M. Rosenberg, Cambridge University Press, (2006). 4. "Essentials of MATLAB Programming", 2nd Ed., Stephen J. Chapman, Cengage Learning, (2009).