

MCA406 : Internet of Things

Teaching Scheme Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	Examination Scheme Class Test -12Marks Teachers Assessment - 6Marks Attendance – 12 Marks End Semester Exam – 70 marks
--	---

Pre-requisites: Network Fundamental and Basic Introduction about Python.

Course Objectives:

7. Define the Internet of Things.
8. To discussed different type of design of IoT.
9. Describe the important computer network and there uses.
10. Introduction to challenges in Design, Development and Security.
11. Introduction to nature wise requirement of different type IoT Application.
12. Introduction to development IoT application in Python.

Detailed Syllabus

Unit-1 Introduction to IoT- Defining IoT, Characteristics of IoT, Physical design of IoT, Logical, design of IoT, Functional blocks of IoT, Communication models & APIs
Unit-2 IoT & M2M- Machine to Machine, Difference between IoT and M2M, Software, define Network
Unit-3 Network & Communication aspects- Wireless medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination
Unit-4 Challenges in IoT- Design challenges, Development challenges, Security challenges, Other challenges
Unit-5 Domain specific applications of IoT- Home automation, Industry applications, Surveillance applications, Other IoT applications
Unit-6 Developing IoTs - Introduction to Python, Introduction to different IoT tools, Developing applications through IoT tools, Developing sensor based application through embedded system platform, Implementing IoT concepts with python
Text and Reference Books 1. Vijay Madiseti, Arshdeep Bahga, “Internet of Things: A Hands-On Approach” 2. Walteneus Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice

Course Outcomes:

1. Understand to IoTs and their design concepts.
2. To understand M2M and IoT and their <i>differences</i> .
3. To understand the network protocol those are used for IoT Configuration.
4. Students will create, design documents for IoTs with understanding of security issues.
5. Students will understand <i>different</i> types of application of IoTs.
6. Students will able to develop IoTs application using Python.

MCA407 : MATLAB

Teaching Scheme Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	Examination Scheme Class Test -12Marks Teachers Assessment - 6Marks Attendance – 12 Marks End Semester Exam – 70 marks
--	---

Prerequisite: - Basic Mathematics, Elementary knowledge of computer programming and basic understanding of matrices, linear algebra, calculus, trigonometric functions and geometry.

Course Objectives:

Familiarization of the syntax, semantics, data-types and library functions of numerical computing languages such as MATLAB and/or SCILAB, and application of such languages for implementation/simulation and visualization of basic mathematical functions relevant to electronics applications.

Detailed Syllabus

UNIT I (6 Hours)

Basics of MATLAB: Starting MATLAB, matrices, variables, and the colon operator, linspace, plotting vectors.

UNIT II (10 Hours)

Matrices: Typing matrices, concatenating matrices, useful matrix generators, subscripting, end as a subscript, deleting rows or columns, matrix arithmetic, transpose.

UNIT III (10 Hours)

MATLAB Programming: Logical expressions, for loops, while loops, conditional programming, scripts, function m scripts, return statements, recursive programming.

UNIT IV (10 Hours)

Basic Graphics: Plotting many lines, adding plots, plotting matrices, clearing the figure window, subplots.

Graphics of Functions of Two Variables: Basic plots, color maps, color bar.

UNIT V (10 Hours)

Text Strings and cell arrays: String matrices, comparing strings, string manipulations, converting numbers to strings, using strings as commands, introduction and use of cell arrays.

UNIT VI (10 Hours)

Multidimensional Arrays: Generating Multidimensional Grids, Operations with Multidimensional Arrays. Digital Image Processing using MATLAB: Reading and writing gray scale image, Conversion of gray scale image to binary image, finding the number of density, perimeter, branch, area points of the image.

Text and Reference Books

1. Basics of MATLAB and beyond, Andrew knight, CRC Press LLC, 2000.
2. A Guide to MATLAB for Beginners and Experienced Users, Brian R. Hunt, Ronald L. Lipsman, Cambridge University, 2005.
3. Digital Image Processing using METLAB, Rafel, Richard & Steven, Pearson, 2007.