# SHRI VENKATESHWARA UNIVERSITY

Syllabus

## MASTER OF COMPUTER APPLICATION (MCA)
IV Semester
(Two Years Programme)

(w.e.f. 2020-21)

## SCHOOL OF ENGINEERING & TECHNOLOGY

SEMESTER- IV MCA

| Sl. No. | Subject Codes | Subject | Periods | | | Evaluation Scheme | | | | End Semester | | Total | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | CT | TA | Total | PS | TE | PE | | |
| 1 | SMC -401 | Web Development using Python | 3 | | 0 | 20 | 10 | 30 | | 70 | | 100 | 3 |
| 2 | SMC – 402 | Software Project Management | 3 | 0 | 0 | 20 | 10 | 30 | | 70 | | 100 | 3 |
| 3 | SMC -431 | Internet of Things | 3 | 0 | 0 | 20 | 10 | 30 | | 70 | | 100 | 3 |
| 4 | SMC -411 | Web Development using Python Lab | 0 | 0 | 4 | | | | 25 | | 25 | 50 | 2 |
| 5 | SMC- 441 | Project Phase -II | 0 | 0 | 12 | | | 100 | | 100 | | 200 | 6 |
| | | | | | | | | | | | | 550 | 17 |

ELECTIVE III

SMC -431 **INTERNET OF THINGS**

SMC -432 Design Thinking & Problemsolving skills

SMC -433Green Computing

**SMC-401 Web Development using Python**

**UNIT I**
Web Technologies , HTML,CSS , JavaScript, Bootstrap ,Adobe Dreamweaver
Adobe Flash
Available Softwares for Graphic Designing

**UNIT II**
Jobs and Salary in Web Designing ,FAQ, Introduction to Functions, Built-in Functions, Standard Functions: Mathematical
Functions, time Functions, Random Numbers, System-specific Functions, The eval and exec Functions, Writing Functions,

UNIT-III

Arrays using array module and numpy() in python
Introduction to Array, Array using array module, Introduction to numpy module, Creating and importing Array, Types of Array, Indexing and slicing on Array, Mathematical operations on Array, Comparing Arrays, Aliasing Arrays, Attributes of an Array, Array methods, Basic operations on Multi-dimensional Array, Matrices in numpy, Random Numbers

UNIT – IV
Lists,
Tuples, Dictionaries & Sets in Python
Introduction to Lists, Use of List, Building Lists, List Membership, List Assignment and Equivalence, List Bounds, Slicing, List Element Removal, Lists and Functions, List Methods, Prime Generation with a List, Command

UNIT- V

Matrix in Python
Importing Matrix, basic operations on Matrix: finding maximum and minimum elements, Sum and average of elements, Products of elements, Sorting the Matrix, Transpose of a Matrix, Matrix operations, Diagonal elements of a Matrix, Random numbers

## SMC 402 SOFTWARE PROJECT MANAGEMENT

### *UNIT-I: Introduction and Software Project Planning*

Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of project plan, Structure of a Software Project Management Plan, Software project estimation, Estimation methods, Estimation models, Decision process.

### *UNIT-II: Project Organization and Scheduling*

Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts.

### *UNIT-III: Project Monitoring and Control*

Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV),Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index

(SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews, Pair Programming.

***UNIT-IV: Software Quality Assurance and Testing***

Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Correctness, Program Verification & validation, Testing Automation & Testing Tools, Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model CMM), SQA Activities, Formal SQA Approaches: Proof of correctness, Statistical quality assurance, Cleanroom process.

***UNIT-V:*** Project Management and Project Management Tools

Software Configuration Management: Software Configuration Items and tasks,Baselines, Plan for Change, Change Control, Change Requests Management, Version Control, Risk Management: Risks and risk types, Risk Breakdown Structure (RBS), Risk Management Process: Risk identification, Risk analysis, Risk planning, Risk monitoring, Cost Benefit Analysis, Software Project Management Tools: CASE Tools, Planningand Scheduling Tools, MS-Project. Books:

1. Software Project Management by M. Cotterell
2. Information Technology Project Management
3. Management Information and Control by
4. Software Project Managemnet by S. A. Kelkar

| **SMC 431 INTERNET OF THINGS** | | 3-0-0 |
|---|---|---|
| **Unit** | **Topic** | **Proposed Lecture** |
| **I** | **Internet of Things (IoT):** Vision, Definition, Conceptual Framework, Architectural view, technology behind IoT, Sources of the IoT, M2M Communication, IoT Examples . **Design Principles for Connected Devices:** IoT/M2M systems layers and design standardization, communication technologies, data enrichment and consolidation, ease of designing and affordability. | **08** |
| **II** | **Hardware for IoT:** Sensors, Digital sensors, actuators, radio frequency identification (RFID) technology, wireless sensor networks, participatory sensing technology. Embedded Platforms for IoT: Embedded computing basics, Overview of IOT supported Hardware platforms such as Arduino, NetArduino, Raspberry pi, Beagle Bone, Intel Galileo boards and ARM cortex. | **08** |
| **III** | **Network & Communication aspects in IoT:** Wireless Medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination | **08** |
| **IV** | **Programming the Ardunio:** Ardunio Platform Boards Anatomy, Ardunio IDE, coding, using emulator, using libraries, additions in ardunio, programming the ardunio for IoT. | **08** |

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| **V** | **Challenges in IoT Design challenges**: Development Challenges, Security Challenges, Other challenges<br>**IoT Applications** : Smart Metering, E-health, City Automation, Automotive Applications, home automation, smart cards, Communicating data with H/W units, mobiles, tablets, Designing of smart street lights in smart city. | **08** |

**References:**


1. Olivier Hersent,DavidBoswarthick, Omar Elloumi"The Internet of Things key applications and protocols", willey
2. Jeeva Jose, Internet of Things, Khanna Publishing House
3. Michael Miller "The Internet of Things" by Pearson
4. Raj Kamal "INTERNET OF THINGS", McGraw-Hill, 1ST Edition, 2016
5. ArshdeepBahga, Vijay Madisetti " Internet of Things( A hands on approach)" 1ST edition, VPI publications,2014
6. Adrian McEwen,Hakin Cassimally "Designing the Internet of Things" Wiley India