SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
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SCHOOL OF COMPUTING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

NEW COURSES INTRODUCED-2017-2018

2018-EVEN

SNO	COURSE CODE	COURSE OFFERED
1	SIT1619	INTERNET OF THINGS
2	SCS1619	PYTHON PROGRAMMING
3	SCS1620	USER INTERFACE TECHNOLOGIES
4	SCS1621	R PROGRAMMING

		L	T	P	Credits	Total Marks
SIT1619	**INTERNET OF THINGS**	3	0	0	3	100

Objectives:

- To understand what internet of Thing is .
- To identify the various elements of an IOT System
- To understand the Various means of communication from Node/Gateway to cloud platforms .
- To understand Cloud computing & its relevance in IOT
- To identify types of data analytics and data visualization tools.
- To make students aware of security concerns and challenges with implementing IOT Solutions .

UNIT 1   **9 Hrs.**

Introduction to IoT, Current technological trends and future prospects, - Evolution of IoT - IoT and related terms – Business Scope, Relation with embedded system, Introduction to Arduino and Raspberrypi, Overview of Elements of IoT - Basic Architecture of an IoT.

UNIT 2   **9 Hrs.**

Application Sensors & Actuators - Edge Networking (WSN) – Gateways - IoT Communication Model – WPAN & LPWA, IoT platform for available applications, Hardware Devices: Arduino, Raspberry pi and Smartwifi, etc, Wearable Development Boards, Softwares, Programs and Stacks available for building IoT applications, Installation of various packages necessary for project and list of tools

UNIT 3   **9 Hrs.**

IoT Communication Model, Cloud computing in IoT, IoT in cloud architecture, Logging on to cloud, Selecting and Creating cloud service ,Managing Cloud Account Credentials and Generating Key Pair, Creating IoT Cloud Service.

UNIT 4   **9 Hrs.**

Big Data Analytics – Data Exploration, Data Visualization, Visualization tools for IoT.

UNIT 5   **9 Hrs.**

DIY Kits – Soil moisture monitoring, Weather monitoring, Air quality Monitoring, Movement Detection, etc, IFTTT and other apps.

                                                                                                                                                Max. 45 Hrs.

COURSE OUTCOMES:

On completion of the course, student will be able to
CO1   : Illustrate the technology and current trends in Internet of things.
CO2   : Understand the various elements of IoT system and hardware devices.
CO3   : Learn the programming languages and platforms for building IoT applications
CO4   : Demonstrate cloud computing and its relevance for developing IoT applications.
CO5   : Implement IoT applications that manage big data with data analytics and visualization tools.
CO6   : Implement hands-on projects using an appropriate software and hardware devices in various applications.

TEXT / REFERENCE BOOKS

1. The Internet of Things: Applications and Protocols, Wiley publications. Author(s): Oliver Hersent, David Boswarthick,Omar Elloumi.
2. Architecting the Internet of Things, Springer publications. Author(s):Dieter Uckelmann, Mark Harrison, FlorianMichahelles.
3. Internet of Things with Arduino Cookbook, Packt Publications. Author(s): Marco Schwatrz.
4. Internet of Things and Data Analytics, Wiley Publications.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100   Exam Duration: 3 Hrs.

PART A: 2 Questions from each unit, each carrying 2 marks   20 Marks
PART B: 2 Questions from each unit with internal choice, each carrying 16 marks   80 Marks

SCS1619	PYTHON PROGRAMMING	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT I   Introduction   9 Hrs.

Introduction to the IDLE interpreter (shell) -Expressions – Data Types - Built-in function -Conditional statements - Iterative statements- Input/output -Compound Data Types - Nested compound statements – Introduction to Object Oriented Concepts.

UNIT II   File Handling   9 Hrs.

File Operations –Iterators - Exception handling - Regular Expressions

UNIT III   GUI Programming   9 Hrs.

GUI Programming in Python - Introduction to GUI library - Layout management - Events and bindings - Fonts – Colours - Canvas - Widgets (frame, label, button, check box, entry, listbox, message, radiobutton, text, spinbox).

UNIT IV   Database and Network   9 Hrs.

Database (using NoSQL): Connector Module –Cursor – Statements - Exceptions in database.
Network connectivity: Socket module - Client – Server – Email – URL Access

UNIT V   Case Study   9 Hrs.

 Web Programming using Python.
Image Processing – Facebook Analysis – Twitter Analysis

Text books:

1. Y. Daniel Liang, Introduction to Programming Using Python, Pearson, 2013.
2. Paul Gries , Jennifer Campbell, Jason Montojo, Practical Programming: An Introduction to Computer Science Using Python 3, Pragmatic Bookshelf, 2/E 2014
3. Magnus Lie Hetland, Beginning Python: From Novice to Professional, Apress

References:

1. James Payne, Beginning Python: Using Python 2.6 and Python 3, Wiley India, 2010
2. Lukaszewski, MySQL for Python: Database Access Made Easy, Pact Publisher, 2010
3. Charles Dierbach, Introduction to Computer Science using Python, Wiley, 2013
4. AdeshPandey, Programming Languages – Principles and Paradigms, Narosa, 2008.

                                                                   Max. 45 Hours

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100   **Exam Duration: 3 Hrs.**

PART A: 2 Questions from each unit, each carrying 2 marks   20 Marks
PART B: 2 Questions from each unit with internal choice, each carrying 16 marks   80 Marks

SCS1620	USER INTERFACE TECHNOLOGIES	L	T	P	Credits	Total Marks
		2	2	2	4	100

UNIT I   Introduction to WWW   **6 Hrs.**
Introduction to Computer networks - Internet Standards – Introduction to WWW – WWW Architecture – SMTP – POP3 – File Transfer Protocol - Overview of HTTP, HTTP request – response — Generation of dynamic web pages.

UNIT II   UI Design   **12 Hrs.**
HTML5: What is HTML5 - Features of HTML5 – Semantic Tags – New Input Elements and tags - Media tags (audio and video tags) – Designing Graphics using Canvas API - Drag and Drop features – Geolocation API - Web storage (Session and local storage).
CSS3: What is CSS3 –Features of CSS3 – Implementation of border radius, box shadow, image border, custom web font, backgrounds - Advanced text effects(shadow) - 2D and 3D Transformations - Transitions to elements - Animations to text and elements

UNIT III   Responsive Web Design (RWD):   **9 Hrs.**
Responsive Design: What is RWD – Introduction to RWD Techniques – Fluid Layout, Fluid Images and Media queries- Introduction to RWD Framework
Twitter Bootstrap – Bootstrap Background and Features - Getting Started with Bootstrap - Demystifying Grids – OffCanvas - Bootstrap Components - JS Plugins – Customization

UNIT IV   Introduction to JavaScript   **12 Hrs.**
  Introduction - Core features - Data types and Variables - Operators, Expressions and Statements - Functions & Scope - Objects - Array, Date and Math related Objects - Document Object Model - Event Handling –Browser Object Model - Windows and Documents - Form handling and validations. Object-Oriented Techniques in JavaScript - Classes – Constructors and Prototyping (Sub classes and Super classes) – JSON –Introduction to AJAX. Introduction – jQuery Selectors – jQuery HTML - Animations – Effects – Event Handling – DOM – jQuery DOM Traversing, DOM Manipulation – jQuery AJAX

UNIT V   : Introduction to jQuery   6 Hrs.
Introduction – jQuery Selectors – jQuery HTML - Animations – Effects – Event Handling – DOM – jQuery DOM Traversing, DOM Manipulation – jQuery AJAX

                                                         Max. 45 Hours

Text/ Referenece Books
1.Harvey & Paul Deitel Associates, Harvey Deitel and abbey Deital, "Internet and world wide web-How to program",Fifth Edition, Pearson Education, 2011.
2.Achyut S Godbole and AtulKahate, "Web Technologies", Second edition, Tata McGraw Hill, 2012.
3.Thomas A Powell, Fritz Schenider,"JavaScript: The Complete Reference", Third Edition, Tata McGraw Hill, 2014.
4.David Flanagan, "JavaScript : The Definitive Guide, Sixth Edition", O'Reilly Media, 2011.
5.Bear Bibeault and yahuda Katz, "jquery in Action" , January 2008.
6.Web link for responsive web design- https://bradfrost.github.io/this-is-responsive/
7.Ebook link for javascript-Https://github.com/jasonzhuang/tech_books/tree/master/js
8.KashmirTsonev, "node.js by Example paperback", May 2015.

SCS1621	R PROGRAMMING	L	T	P	Credits	Total Marks
		3	0	0	3	100

Objectives

Understand how to link data, statistical methods, and actionable questions
Use R for statistical programming, computation, graphics, and modeling.
Fit some basic types of statistical models.
Be able to expand their knowledge of R on their own.
To identify types of data analytics and data visualization tools.

Unit – I   9 Hrs
Introduction to R - History and fundamentals of R, Installation and use of R / R Studio / R Shiny, Installing R packages, R – Nuts and Bolts -Getting Data In and Out - Control Structures and Functions- Loop Functions-Data Manipulation- String Operations-Matrix Operations.

Unit – II   9 Hrs
R Data interfaces - CSV Files, XML files, Web Data- Data Preprocessing: Missing Values, Principle Component Analysis - Data Visualization – Charts & Graphs-Pie Chart, Bar Chart, Box plot, Histogram, Line graph, Scatter Plot.

Unit – III   9 Hrs
Statistical Modeling in R - Descriptive statistics-R Packages: Regression (MASS package) - Distribution (STATS package) - ANOVA - Time Series Analysis.

Unit – IV   9 Hrs
Machine Learning in R - Classification: Decision Trees, Random Forest, SVM – Clustering - Association Rule Mining - Outlier Detection.

Unit-V   9 Hrs
Overview of R Shiny - R Hadoop - Case Study - Hypothesis Generation, Importing Data set and Basic Data Exploration, Feature Engineering, Model Building.

Max. 45 Hours

TEXT / REFERENCE BOOKS:

Hands-On Programming with R: Write Your Own Functions and Simulations By Garrett Grolemund, O'Reilly Media, Inc., 2014.
R for Data Science, Hadley Wickham, Garrett Grolemund,"O'Reilly Media, Inc.2016.
Introduction to Statistics and Data Analysis - With Exercises, Solutions and Applications in R By Christian Heumann, Michael Schomaker and Shalabh, Springer, 2016
The R Software-Fundamentals of Programming and Statistical Analysis -Pierre Lafaye de Micheaux, Rémy Drouilhet, Benoit Liquet, Springer 2013
A Beginner's Guide to R (Use R) By Alain F. Zuur, Elena N. Ieno, Erik H.W.G. Meesters, Springer 2009