



## **SYLLABUS FEEDBACK -ACTION TAKEN REPORT FOR M.Tech IT COURSE**

The action taken report is documented based on the analysis of the feedback received from 1. Students enrolled from academic year 2014 to 2018 2. Teachers 3. Alumni and 4. Employers for Regulations 2015 which is incorporated in Regulations 2019.

1. Employability/ Curriculum adopting new technologies- Courses with contents of current technologies of industry is introduced in this regulation. Number of professional elective courses were increased from 34 to 43 to include the technological advancements in the IT domain. New electives such as Block chain Technologies, Mixed Reality, Linked Open data, Service Oriented Architecture and Microservices, Autonomous Ground Vehicle Systems are added in the curriculum. Additionally 6 open electives such as Business Data Analytics, Industrial safety, Operation Research, cost management of Engineering Projects are provided to gain focus in special skill development.

2. Lab courses content/developing programming skills- To cater the need of the industry laboratory courses such as advanced data structures and algorithms lab and Web technologies lab are enhanced to cover the domain concepts in depth. Data Engineering Lab is the new lab course introduced as per the expert opinion from industry. Practical exercises along with theory is included in 35 courses of this curriculum. Open source technology course is added to enhance programming skills in open source environment.

3. Specialization stream - Grouping of electives is introduced to enhance breadth and depth wise knowledge among the subject content currently demanding in industry. The option of choosing electives are framed in such a way that all core concepts are covered during their course period.

4. Self learning ,Team spirit and Leadership- Activities such as external learning, tutorials and group discussions are added in the syllabus that motivate students to inculcate self-learning and the methods of evaluating those activities such as quiz and mock tests conducted by teachers are also specified along with the syllabus content. Audit courses like stress management by Yoga and personality development through life enlightenment skills.

5. Entrepreneurship skill – Activities are included in the syllabus such as group discussions in Courses to analyze the entrepreneurial opportunities.

6. Initiative thinking- Research Methodology and IPR course is included in first semester to inculcate initiative thinking at research perspective and optional audit courses feature is also included in subsequent semesters.

7. Reference Books- The source of all reference books and links are verified for all the courses and their latest versions are specified in the curriculum.



S.NO	DESCRIPTION	REGULATIONS 2015	REGULATIONS 2019
1	NUMBER OF PROFESSIONAL COURSES	13	8
2	NUMBER OF PROFESSIONAL ELECTIVES	34	43
3	NUMBER OF EMPLOYABILITY ENHANCEMENT COURSES	3	3
4	NUMBER OF AUDIT COURSES	0	9
5	NUMBER OF OPEN ELECTIVE COURSES	0	6
6	RESEARCH METHODOLOGIES AND IPR COURSES	0	1
7	NUMBER OF FOUNDATION COURSES	1	1
9	TOTAL NUMBER OF COURSES	51	71
<b>DEVIATION SUMMARY- REGULATIONS 2019</b>			
NUMBER OF LAB INTEGRATED PROFESSIONAL CORE COURSES		<b>3</b>	
NUMBER OF LAB INTEGRATED PROFESSIONAL ELECTIVE COURSES		<b>35</b>	
DEVIATION IN TOTAL NUMBER OF COURSES FROM REGULATION 2015		<b>PLUS 20</b>	
NUMBER OF NEW ELECTIVES OFFERED		<b>16 (PEC) + 16( AC+OEC+RMC) = 32</b>	
TOTAL NUMBER OF NEW COURSES		<b>(6 PCC and 32 ELECTIVES) = 38</b>	
NUMBER OF COURSES WITH >20% OF SYLLABUS CONTENT DEVIATION		<b>27</b>	
PERCENTAGE DEVIATION IN NUMBER OF NEW COURSES IN REGULATIONS 2019 FROM REGULATIONS 2015		<b>&gt;50%</b>	




**NOTABLE SYLLABUS CONTENT CHANGES IN REGULATIONS 2019**

S.NO	COURSE DETAILS
1	<p><b>ADVANCES IN DATABASE (CORE) R2015</b>            ADVANCED DATABASE SYSTEMS (ELECTIVE) R2019</p> <p>NoSQL – CAP Theorem – Sharding – Document based-MongoDB Operation: Insert, Update, Delete, Query, Indexing, Application, Replication, Sharding, Deployment – Using MongoDB with PHP / JAVA – Advanced MongoDB Features – Cassandra: Data Model – Key Space – Table Operations – CURD Operations – CQL Types – HIVE : Data types – Database Operations – Partitioning – HiveQL – OrientDB Graph database: OrientDB Features.            – Data Warehouse: Introduction –Multidimensional Data Modeling – Star and Snowflake Schema – Architecture – OLAP Operations and Queries.            IR concepts –Retrieval models – Queries in IR system – Text Preprocessing – Inverted indexing – evaluation measures – web search and analytics – current trends.</p>
2	<p><b>NETWORK ENGINEERING (CORE) R2015</b>            ADVANCED NETWORKS (CORE) R2019</p> <p>Ipv6 Addressing Scheme – Ipv6 Header – Address Auto Configuration – Ipv6 Enhancements. NFV Concepts and Architecture – Virtualization and Data Plane I/O – Service Locations and Chaining – Functionality – Management – Use Cases of SDNs: Data Centers, Overlays, Big Data.            PRACTICAL EXERCISES: 1. Generate network traffic with a Web Browser. Using Wireshark capture the traffic flow for various protocols. 2. Build a simple network in Packet Tracer and observe how data flows in the network. 3. Analyze traffic flows statistics during network tests. 4. Start capturing packets and use telnet to login and enter the password. Use Wireshark and capture in order to identify and reassemble the password from the captured network traffic. 5. Configure MPLS LDP sessions between two directly connected routers. 6. Write a simple monitoring module that counts all packets going to or leaving host (mininet/ryu). 7. Configure Openflow switches with dpctl command. 8. Create a simple_switch application that keeps track of where the host with each MAC address is located and accordingly sends packets towards the destination and not flood all ports. 9. Develop a Ryu SDN switch application with load balancing. Implement a round robin mechanism for deciding the forwarding port when installing the flows in the switch. 10. Write a simple firewalling module that blocks traffic between 2 hosts</p>
3	<p><b>INTEGRATED SOFTWARE ENGINEERING METHODOLOGY (CORE) R2015</b>            SOFTWARE DESIGN METHODOLOGIES (CORE) R2019</p> <p>Software Engineering Practices – Essence – Core Principles – Communication Practice – Planning Practice – General Structure of a Process – Process Framework – Process Improvements. Real-time Software Design – Real-time Requirement specification – Design Guidelines for Real-time Software- Software Quality Management – Software Metrics.</p>



4	<p><b>VIRTUALIZATION (ELECTIVE)R2015</b> VIRTUALIZATION (ELECTIVE)R2019</p> <p>Comparison of Virtualization Technologies: Guest, host os, hypervisor, emulation, kernel level, shared kernel – Enterprise Solution: Vmware Server, Esxi, Citrix XenServer, Microsoft virtual PC, Microsoft Hyper-V, Virtual box – Server Virtualization: configuring Server with server virtualization, adjusting &amp; tuning virtual servers. VM backup &amp; migration – Desktop Virtualization: terminal services, hosted desktop, web based solutions, localized virtualized desktop – Network &amp; storage virtualization: VPN, VLAN, SAN &amp; VSAN, NAS.</p>
5	<p><b>SOFTWARE ARCHITECTURE (ELECTIVE)R 2015</b> SOFTWARE ARCHITECTURE AND PRINCIPLES (ELECTIVE) R2019</p> <p>ARCHITECTURAL VIEWS : Introduction – Standard Definitions for Views – Structures and Views – Representing Views– View of RUP, Siemens 4 Views, SEI’s Perspectives and Views – Reference Models and Reference Architectures – Architectural Structures and Views. DOCUMENTATION AND TOOLS : Creating a Skeletal System – Uses of Architectural Documentation – Documentation Across Views – Software Tools for Architecture Design – Excel as an Architecture Tool – Exploiting Style in Architectural Design – Quality-Driven Software Architecture Design.</p>
6	<p><b>BUILDING INTERNET OF THINGS (ELECTIVE) R2015</b> BUILDING INTERNET OF THINGS (ELECTIVE) R2019</p> <p>Microprocessors vs. Microcontrollers – Open Source Movement in Hardware – Engineering vs Prototyping – Software Development Lifecycle for Embedded Systems – Arduino IDE – Programming and Developing Sketches – Arduino Rest APIs – Raspberry Pi – Interfaces – Python Packages of Interests for IoT. – Hadoop – Map Reduce Programming Model, Job Execution and Work Flow, Cluster Setup – Lambda Architecture – Flexible Netflow Architecture – Providing Multiservice in IoT using FNF Components. Cloud Storage Models and Communication API – WAMP AutoBahn – Xively Cloud – Python Web Application Framework – Django–IBM Watson – AWS for IoT</p> <p>PRACTICAL EXERCISE: 1. Develop a BLINK sketch in Arduino. 2. Develop an Arduino sketch that repeats an LED to glow brightly, decrease the brightness, switches off the LED, increases the brightness and LED glows with maximum intensity (a sketch for fading). 3. Develop an Arduino sketch that takes sensor readings for five seconds during the startup, and tracks the highest and lowest values it gets. These sensor readings during the first five seconds of the sketch execution define the minimum and maximum of expected values for the readings taken during the loop (a sketch for calibrating a sensor). 4. Develop an Arduino sketch that reads the value of a variable resistor as an analog input and changes blink rate of the LED. 5. Develop an Arduino sketch to use a piezo element to detect the vibration. 6. Develop a Python program to control an LED using Raspberry Pi. 7. Develop a Python program to interface an LED with a switch using Raspberry Pi. 8. Implement a map reduce program that produces a weather data set. 9. Implement an application that stores big data in Hbase/Mongo DB using Hadoop/R. 10. Use Google Collaboration Tools: Create Google Docs, Sheets, and Slides and share it with others. 11. Miniproject.</p>



7	<p><b>SOCIAL NETWORK ANALYSIS (ELECTIVE) R2015</b> ANALYSIS OF SOCIAL NETWORKS (ELECTIVE) R2019</p> <p><b>30 % ONLY SAME +PRACTICAL EXERCISES</b></p>
8	<p><b>COMPUTER VISION (ELECTIVE) R2015</b> COMPUTER VISION (ELECTIVE) R2019</p> <p>COMPUTER VISION APPLICATION : Emotion Recognition – Real Time Object Detection – Gesture Recognition – Face Detection.</p> <p>PRACTICAL EXERCISE: 1. Implementation of Noise removal algorithms using OpenCV. 2. Implementation of Object detection based on Edge detection algorithms on any application using OpenCV. 3. Implementation of Perspective projection of the lane borders using OpenCV. 4. Implementations of Feature Extraction of an object using SIFT in OpenCV. 5. Implementation of Feature Extraction of an object using SURF in OpenCV. 6. Implementation of Emotion Recognition in OpenCV. 7. Implementation of Gesture Recognition in OpenCV. 8. Implementation of Face Detection in OpenCV. 9. Implementation of Object detection using AdaBoost in OpenCV</p>
9	<p><b>HUMAN COMPUTER INTERACTION (ELECTIVE) R2015</b> HUMAN COMPUTER INTERACTION TECHNIQUES (ELECTIVE) R2019</p> <p>PRACTICAL EXERCISES:</p> <p>1. Study of UI Development Tools like scratch, React, Adobe XD, Flash, Wix, Bootstrap and Angular js. 2. Study of user interfaces of common applications like Facebook, UberEats, Twitter, IRCTC, Anna university Sems, Amazon etc. Prepare a comparative Design document. 3. Design and development of simple user interface for an E-commerce website. 4. Design and development of the user interface of a university Web portal. 5. Design and development of movie ticket booking interface for Physically Challenged people. Prepare design document for the following interfaces which should include the design process, design methodology and the design rules used in the development of the UI application. The document should also justify the chosen methodology for the given application. Using an evaluation technique, evaluate the way in which user experiences with your proposed design would be satisfiable to the end user. 6. Implementation of Mixed Reality based visual interface for dialogue based systems. 7. Implementation of user interfaces for video streaming application which caters to the need of older people. 8. Design and development of mobile application interfaces for chat bots. 9. Design and development of novel user interfaces for any wearable device. 10. Design and develop an interface for geographical information system.</p> <p style="text-align: right;"> 9/5/19</p> <p style="text-align: right;"><b>PROFESSOR AND HEAD</b> Department of Information Science and Technology Anna University, Chennai-600 025.</p>