



SYLLABUS FEEDBACK -ACTION TAKEN REPORT FOR MCA 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 - Summer Internship is introduced to facilitate the students in orientation with current employment options in industry. Apart from that the number of credits for Employability enhancement courses are also increased from 12 to 15.

2. Electives - Number of professional elective courses were increased from 33 to 34 to include the technological advancements in the IT domain. New electives such as Cybernetics, IoT based smart systems, Mixed Reality, Autonomous Ground Vehicle Systems, Full Stack Development, Bid data with R and Block chain Technologies were 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.

3. Lab courses content- To cater the need of the industry laboratory courses such as Advanced data structures, Data science and Internet of Things and cloud are introduced which covers the domain concepts in depth based on the opinion of industry experts.

4. Self learning- Activities such as external learning, tutorials and assignments are added in the syllabus that motivate students to inculcate self-learning and the methods of evaluating those activities by teachers are also specified along with the syllabus content.

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

5. Technological advancements- The contents for Program Elective Courses are framed by considering the opinion from industry experts to incorporate the current technological advancements.

6. Self learning- External learning activities are introduced in the courses to develop the student's caliber of self learning and the same will be evaluated by the teachers.

7. Team spirit- Apart from working as a team in their projects ,optional audit courses were introduced to enhance student's team leadership and working among heterogeneous group with content related to value education, disaster management, constitution of India, Stress management and Personality Development through Life Enlightenment Skills.

S.NO	DESCRIPTION	REGULATIONS 2015	REGULATIONS 2019
1	NUMBER OF PROFESSIONAL COURSES	28	26
2	NUMBER OF PROFESSIONAL ELECTIVES	32	33
3	NUMBER OF EMPLOYABILITY ENHANCEMENT COURSES	4	4
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	2	2
9	TOTAL NUMBER OF COURSES	66	81
DEVIATION SUMMARY- REGULATIONS 2019			
DEVIATION IN TOTAL NUMBER OF COURSES FROM REGULATION 2015		+ 15	
NUMBER OF NEW ELECTIVES OFFERED		18	
TOTAL NUMBER OF NEW COURSES		56	
PERCENTAGE DEVIATION IN NUMBER OF NEW COURSES IN REGULATIONS 2019 FROM REGULATIONS 2015		>67%	

NOTABLE SYLLABUS CONTENT CHANGES IN REGULATIONS 2019

1. **R-2015 Computer Organization and Design**

R-2019 Digital Logic and Computer Organization

Content:

- UNIT III COMPUTER FUNDAMENTALS - Functional Units of a Digital Computer: Operation and Operands of Computer Hardware Instruction – Instruction Set Architecture (ISA): Memory Location, Address and Operation – Instruction and Instruction Sequencing – Addressing Modes, Encoding of Machine Instruction – Interaction between Assembly and High Level Language (C language).
- UNIT IV PROCESSOR -Instruction Execution – Building a Data Path – Designing a Control Unit – Hardwired Control, Microprogrammed Control – Pipelining – Data Hazard – Control Hazards.
- UNIT V MEMORY AND I/O- Memory Management- Interconnection Standards: USB, SATA.



2. R-2015 Data Structure

R-2019 C Programming and Data Structures

Content:

- UNIT I BASICS OF C PROGRAMMING - Data Types – Variables – Operators and Expressions – Conditional Statements – Control Statements – Arrays.
- UNIT II ADVANCED C PROGRAMMING - Functions – Pointers – Structures and Union – Preprocessor Directives – File Handling.

3. R-2015 Operating System Concepts

R-2019 Operating Systems

Content:

- UNIT I INTRODUCTION TO OPERATING SYSTEMS -Types of Operating System – Major OS Components – Operating System Operations – Operating System Services–Operating System Structure
- PRACTICAL EXERCISES:
 1. Introduction to Linux. 2. Experiment most common system calls(e.g OPEN, CREAT, READ, WRITE, CLOSE, LSEEK)in order to make input output operations on files, as well as operations to handle files and directories in Linux. 3. Create, work with and manipulate processes in Linux. 4. Practical - Implement FCFS and SJF scheduling algorithm. 5. Practical - Implement Round Robin scheduling algorithm. 6. Practical - Implement a program using pthreads. 7. Practical - Implement a basic Semaphore. 8. Practical - Implement interprocess communication using pipes. 9. Practical - Implement interprocess communication using signals. 10. Practical - Implement a program to design a game using Unix pipes and IPC through shared memory and message queues.



4. R-2015 Software Engineering Methodologies

R-2019 Software Engineering

Content:

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| <ul style="list-style-type: none">• UNIT II SOFTWARE REQUIREMENTS - Functional and Non Functional Requirements – Software Requirements Document – Requirements Engineering Processes – Requirements Elicitation & Analysis – Requirements Validation – Requirements Management. |
| <ul style="list-style-type: none">• UNIT III ANALYSIS AND DESIGN 9 Analysis Modeling Approaches: Scenario Based Modeling – UML Models – Data Modeling Concepts: Class Based Modeling, Flow Oriented Modeling – Design Process and Concepts – Design Model – Architectural Design – Pattern Based Design – Web App Design – Real Time Software Design – System Design – Data flow Oriented Design – Designing for Reuse – User Interface Design: Interface analysis, Interface Design – Component level Design: Designing Class Based Components, Traditional Components. |
| <ul style="list-style-type: none">• UNIT IV SOFTWARE TESTING - Software Testing Strategies – White Box Testing – Black Box Testing – Basis Path Testing – Control Structure Testing – Regression Testing –Integration Testing – Validation Testing – System testing – Art of Debugging. |
| <ul style="list-style-type: none">• UNIT V MANAGEMENT AND METRICS -Software Configuration Management – Project management concepts – Process and Project Metrics – Software Cost Estimation – Project scheduling – Risk Management – Software Quality Assurance . |

5. R-2015 Design and Analysis of Algorithms

R-2019 Advanced Data Structures and Algorithm Design

Content:

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| <ul style="list-style-type: none">• UNIT I ADVANCED NON-LINEAR DATA STRUCTURES 8-AVL Trees – Splay Trees: Splaying – Top Down Splay Trees – B-Trees – Red Black Trees: Bottom Up Insertion – Tries. |
| <ul style="list-style-type: none">• UNIT IV ALGORITHMS IN COMPUTING 9 Introductions to Algorithms – Iterative and Recursive Algorithms – Designing Algorithms – Analyzing Algorithms – Growth of Functions: Asymptotic Notations – Standard Notations and Common Functions – Recurrences: The Substitution Method – The Recursion – Tree Method – Master’s Method. |



6. R-2015 Embedded Systems

R-2019 Embedded Systems and Internet of Things

Content:

- UNIT II EMBEDDED C PROGRAMMING -Memory and I/O Devices Interfacing – Programming Embedded Systems in C – Need for RTOS – Multiple Tasks and Processes – Context Switching – Priority Based Scheduling Policies.
- UNIT V APPLICATIONS - Complete Design of Embedded Systems – Smart Cities: Smart Parking, Smart Traffic Control, Surveillance – Home Automation: Smart Appliances, Intrusion Detection, Smoke/Gas Detectors – Cloud Storage and Communication APIs: WAMP, Xively, Django – Data and Analytics for IoT.

7. R-2015 Mobile Application Development Laboratory

R-2019 Mobile Application Development Techniques Laboratory

Content:

- EXPERIMENTS: 1. Develop an application that uses GUI components, font and colours. 2. Design an application that uses Layout Managers and event listeners. 3. Develop a native calculator application. 4. Design an application that draws basic graphical primitives on the screen. 5. Develop an application that makes use of mobile database. 6. Develop an application that makes use of internet for communication. 7. Implement an android application that writes data into the SD card. 8. Implement an application that creates an alert upon receiving SMS message. 9. Develop a native application that uses GPS location information. 10. Develop a mobile application that creates a notification as task reminder. 11. Develop an android application using telephony to send SMS. 12. Implement primitive graphics in android application for color fill in objects.



8. **R-2015 Object Oriented Analysis and Design –CORE**

R-2019 Object Oriented Analysis and Design –ELECTIVE

Content:

UNIT III DESIGN PATTERNS - Logical Architecture and UML Package Diagrams: Logical Architecture and its Layers, Software Architecture, Applying UML Package Diagrams, Connection between SSDs, System Operation and Layers – MVC Pattern – GRASP: Designing Object with Responsibilities

UNIT V MORE PATTERNS AND CASE STUDY -Analysis Update – GoF Patterns – Domain Model Refinement – Architectural Analysis– Designing a Persistence Framework with Patterns – Documenting Architecture: UML and the N+1 View Model.

9. **R-2015 Game Programming–ELECTIVE**

R-2019 Game Programming Techniques–ELECTIVE

Content:

- UNIT III VIEWING AND VISUAL REALISM -Three-Dimensional Viewing – Hidden Surface Removal – Illumination Models – Depth Cueing – Perspective Projections of 3d Objects – Introduction to Shading Models – Flat Shading and Smooth Shading – Adding Texture to Faces – Morphing – To Add Shadows of Objects – OpenGL Shading Language – Manipulating Pixmaps – Manipulating Symbolically Defined Regions – Aliasing and Anti-Aliasing Techniques – Creating More Shades and Colours.
- UNIT V ANIMATIONS -Design of Animation Sequence – Animation Function – Raster animation– Motion Specification – Morphing – Tweening – Types of animation – Fractals – Tools for animation creation

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