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Department of Computer Engineering
(Affiliated to University of Mumbai)

2.6.1 Program Outcomes and Program Specific Outcomes

Vision of Institute

To nurture the Joy of Excellence in world of High Technology.

Mission of Institute

To strive to match global standards in Technical Education by Interaction with Industry, Continuous Staff training and Development of quality of life.

Program Outcomes

(Graduate will be able to -)

PO1 Engineering knowledge: To apply the knowledge of mathematics and engineering fundamentals along with Computer science and physical sciences for the solution of complex engineering problems.

PO2 Problem analysis: To identify, formulate, and analyze complex engineering problems to provide suitable solutions by applying knowledge acquired in computer science and engineering.

PO3 Design/development of solutions: To design cost effective software or hardware solutions to meets needs of customers.

PO4 Conduct investigations of complex problems: To use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions in the field of computer science and engineering.

PO5 Modern tool usage: To create, select, and apply appropriate techniques, resources, and modern computer science and engineering tools, including prediction and modelling to complex engineering activities, with an understanding of the limitations.

PO6 The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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PO7 Environment and sustainability: To understand the impact of the professional engineering solutions to preserve the environment and the concern of sustainability.

PO8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 Communication: Communicate effectively on complex engineering activities with the engineering community and with t h e society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 Life-long learning: Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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Computer Engineering Department

Vision of Computer Department

To nurture the joy of excellence in a world of Computer Engineering.

Mission of Computer Department

M1 -- To provide students the knowledge of computer engineering with related technical skills to solve various computer engineering problems and to have industry interaction.

M2 -- To motivate the students to acquire additional soft skills to sharpen their technical and professional skills that can make them employable.

M3 -- To nurture social and professional ethics in our undergraduates and encourage them to have lifelong learning.

Program Specific Outcomes of Computer Department

PSO1. The ability to understand, analyze and apply knowledge to address real world problems.

PSO2. The ability to design and implement software solutions to meet the customer's need.

Programme Educational Objectives of Computer Department (PEOs)

PEO1 -- To prepare the learner with a sound foundation in the mathematical, scientific and engineering fundamentals.

PEO2 -- To motivate the learner in the art of self-learning and to use the modern tools for solving real life problems.

PEO3 – To equip the learner with broad education necessary to understand the impact of computer science and engineering in a global and social context.

PEO4 -- To encourage, motivate and prepare the learners for lifelong learning.

PEO5 -- To inculcate professional and ethical attitude, good leadership qualities and commitment to social responsibilities in learner's thought process.

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Information Technology Department

Vision of I.T. Department

To nurture the joy of excellence in a world of Information Technology.

Mission of I.T. Department

- To develop the critical thinking ability of students by promoting integrative learning.
- To bridge the gap between industry and institute by giving students exposure to industrial demands and current trends.
- To promote excellence in learning and research, and to be responsible when dealing with social concerns.
- To encourage students to pursue higher studies and make them aware of various career opportunities.

Program Specific outcome of I.T. Department (PSO)

- Demonstrate the ability to analyze and visualize the business domain and formulate appropriate information technology solutions.
- Apply various technologies like Intelligent Systems, Data Mining, IOT, Cloud and Analytics, Computer and Network Security etc. for innovative solutions to real time problems.

Program Education Objective of I.T. Department (PEO)

After 3-5 years of graduation, Information Technology Engineering Graduates will be

- Employed as IT professionals, and will be engaged in learning, understanding, and applying new ideas and technologies as the field evolves.
- Competent to use knowledge successfully in the diversified sectors of industry, academia, research and work effectively in multidisciplinary environments.
- Aware of professional ethics and create a sense of social responsibility in building the nation/society.

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Electronics and Telecommunication Department

Vision of EXTC Department

To nurture the joy of excellence in the world of Electronics and Telecommunication Engineering.

Mission of EXTC Department

- To equip students with strong foundations to enable them for higher studies and lifelong learning.
- To educate the students for the state of art technologies to meet challenges of Electronics and Telecommunication field.
- To collaborate and associate with highly reputed institutes from India and Abroad to enhance professional excellence.
- To impart total quality education for developing innovative, entrepreneurial and ethical professionals, fit for globally competitive environment.
- To strengthen the soft skills and logical thinking of students through co-curricular and extracurricular activities.

Program Specific Outcomes of EXTC Department

At the end of the program, a student will be able

- To combine fundamentals of electronics, signal processing, communication, control system along with analysis and programming skills to solve complex problems in the field of Electronics and Telecommunication Engineering.
- To design, develop, test and demonstrate wired and wireless electronics and embedded system with innovative solutions and consideration of real-time constraints.

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Program Educational Objective of EXTC Department

PEOs of the B.E (Electronics and Telecommunication Engineering) program are as following:

- **Pre-preparation: To** prepare students with strong foundation in mathematical, scientific and engineering fundamentals to enable them for a successful career.
- **Core Competence: To** train the students to cope up with the need of rapidly growing technology with core knowledge in the area of Electronics and Telecommunication Engineering.
- **Breadth: To** train the students to upskill their knowledge and skills across the range of disciplines and find solutions to improve the quality of life.
- **Professionalism: To** encourage students for soft skills with good communication, ethical values and ability to work in a team in their chosen field.
- **Learning Environment:** To make students competent for self-learning so that they can contribute to emerging technologies.

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COMP DEPARTMENT PO and PSO ATTAINMENT TABLE - 2019-2020				
	SUBJECT NAME	SUBJECT CODE	CO / LO Number	CO / LO Statement (Students should able to)
1	Applied Mathematics -III	CSC301	CSC301.1	Find Laplace transforms and Inverse Laplace transforms and using Laplace transforms solve initial value problem.
			CSC301.2	Write a given periodic function in Fourier series ,Fourier integral and complex form of Fourier series.
			CSC301.3	Find analytic function and using given analytic transformation find image of curves.
			CSC301.4	Find the coefficient of correlation between two variables and find regression lines.
			CSC301.5	represent a number sequence as a function of z using Z-transform and find inverse Z-transform
2	Digital Logic Design and Analysis	CSC302	CSC302.1	Understand different number systems and their conversions
			CSC302.2	Analyze and minimize Boolean expressions
			CSC302.3	Design and analyze combinational circuits
			CSC302.4	Design and analyze sequential circuits
			CSC302.5	Understand the basic concepts of VHDL
			CSC302.6	Study basics of TTL and CMOS Logic families
3	Discrete Structures	CSC303	CSC303.1	Understand the notion of sets and how to apply them in problem solving.
			CSC303.2	Ability to reason logically.
			CSC303.3	Ability to understand relations, Diagraph ,lattice and functions
			CSC303.4	Understand the counting principles (permutations, combinations and probability) and how to apply them.
			CSC303.5	Ability to understand graphs.
			CSC303.6	Understand use of groups and codes in Encoding-Decoding.
4	Electronic Circuits and Communication Fundamentals	CSC304	CSC304.1	Ability to understand field effect devices and carry out their DC analysis and ability to understand concept of feedback and oscillations.
			CSC304.2	Ability to use operational amplifier in various applications
			CSC304.3	Ability to understand fundamental concepts of communication.

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			CSC304.4	Ability to understand fundamental concepts of frequency modulation
			CSC304.5	Ability to understand concept of phase lock loop and their use communication applications.
5	Data Structures	CSC305	CSC305.1	Implement various linear data structures & be able to handle operations like insertion, deletion, searching and traversing on various linear data structures.
			CSC305.2	Implement various nonlinear data structures & be able to handle operations like insertion, deletion, searching and traversing on various nonlinear data structures.
			CSC305.3	Select appropriate sorting and searching technique for given problem.
			CSC305.4	Choose appropriate data structure and apply it in various problem domains.
6	Digital System Lab	CSL301	CSL301.1	To interpret the basics of various digital components.
			CSL301.2	To illustrate the design principles of combinational logic and sequential logic circuits.
			CSL301.3	Recognize the importance of digital systems in computer architecture.
			CSL301.4	To design and simulate the basic digital circuit.
7	Basic Electronics Lab	CSL302	CSL302.1	Able to analyse and design basic applications of opamp
			CSL302.2	able to study and analyse basic waveforms of AM and FM
			CSL302.3	Able to study and analyse PAM PWM PPM
8	Data structure Lab	CSL303	CSL303.1	Develop programs to implement various linear data structures & be able to test operations like insertion, deletion, searching and traversing on various linear data structures.
			CSL303.2	Develop programs to implement various nonlinear data structures & be able to test operations like insertion, deletion, searching and traversing on various nonlinear data structures.

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			CSL303.3	Select appropriate sorting and searching technique for given problem & develop programs in order to implement them.
			CSL303.4	Choose appropriate data structure and develop programs to apply it in various problem domains.
9	OOPM(Java) Lab	CSL304	CSL304.1	Apply fundamental programming constructs.
			CSL304.2	Illustrate the concept of packages, classes and objects.
			CSL304.3	Elaborate the concept of strings, arrays and vectors.
			CSL304.4	Implement the concept of inheritance and interfaces.
			CSL304.5	Implement the concept of exception handling and multithreading
			CSL304.6	Develop GUI based application.
10	Applied Mathematics- IV	CSC401	CSC401.1	Find the eigen values and eigen vectors of matrices
			CSC401.2	Evaluate Complex Line integral
			CSC401.3	Find Laurent's series of a given complex function
			CSC401.4	Solve Linear and Non-Linear programming Problem
			CSC401.5	Find the probability of a random variable
11	Analysis of Algorithms	CSC402	CSC402.1	Analyze the running time and space complexity of algorithms
			CSC402.2	Describe, apply and analyze the complexity of divide and conquer strategy
			CSC402.3	Describe, apply and analyze the complexity of greedy strategy
			CSC402.4	Describe, apply and analyze the complexity of dynamic programming strategy
			CSC402.5	Explain and apply backtracking, branch and bound and string matching techniques to deal with some hard problems
			CSC402.6	Describe the classes P, NP, and NP-Complete and be able to prove that a certain problem is NP-Complete
12	Computer Organization and Architecture	CSC403	CSC403.1	Describe structure of the computer system.
			CSC403.2	Demonstrate the arithmetic algorithms for solving ALU operations.
			CSC403.3	Describe instruction level parallelism, hazards & different architectures.

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			CSC403.4	Demonstrate memory mapping techniques & solve problems based on it.
			CSC403.5	Identify various types of buses, interrupts, I/O operations & different ways of communicating with I/O devices.
			CSC403.6	Describe superscalar architectures, multi-core architecture and their advantages
13	Computer Graphics	CSC404	CSC404.1	Understand the basic concepts of Computer Graphics.
			CSC404.2	Demonstrate various algorithms for scan conversion such as line, circle or ellipse drawing.
			CSC404.3	Apply filling & clipping algorithms on basic objects and study their comparative analysis.
			CSC404.4	Apply geometric transformations, viewing and clipping on graphical objects and explore solid model representation techniques and projections.
			CSC404.5	Understand visible surface detection techniques and illumination models.
14	Operating System	CSC405	CSC405.1	Understand the basic functions and role of Operating System.
			CSC405.2	Apply and analyze the concept of a process, thread and evaluate performance of process scheduling algorithms.
			CSC405.3	Apply and analyze the mutual exclusion, deadlock and IPC.
			CSC405.4	Apply and analyze the concepts of memory management techniques and evaluate the performance of memory allocation and replacement techniques .
			CSC405.5	Apply and analyze different techniques of file and I/O management.
15	Analysis of Algorithms Lab	CSL401	CSL401.1	To analyze complexity of divide & conquer approach algorithms.
			CSL401.2	To analyze complexity of dynamic programming approach algorithms
			CSL401.3	To analyze complexity of greedy approach algorithms
			CSL401.4	To analyze complexity of backtracking and branch & bound approach algorithms
			CSL401.5	To analyze complexity of string matching algorithms
16	Computer Graphics Lab	CSL402	CSL402.1	Explore the working principle, utility of various input/output devices and graphical tools.
			CSL402.2	Implement various scan conversion and area filling algorithms using C/OpenGL.
			CSL402.3	Apply transformation and clipping algorithms on graphical objects.
			CSL402.4	Implementation of curve and fractal generation.

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			CSL402.5	Develop a Graphical application based on learned concept.
17	Processor Architecture Lab	CSL403	CSL403.1	Assemble personal computer
			CSL403.2	Design the basic building blocks of a computer: arithmetic-logic unit, registers, central processing unit, and memory.
			CSL403.3	Implement various algorithms like Booth's algorithm for arithmetic operations
			CSL403.4	Describe various I/O buses with merits and demerits
18	Operating System Lab	CSL404	CSL404.1	Understand basic operating system commands and system calls.
			CSL404.2	Write shell scripts and shell commands using kernel APIs.
			CSL404.3	Implement and analyze different process scheduling algorithms, process management techniques and deadlock handling.
			CSL404.4	Implement and analyze different memory management algorithms.
			CSL404.5	Implement a mini project using operating concepts.
19	Open Source Tech Lab	CSL405	CSL405.1	Understand basic concepts in Python.
			CSL405.2	Develop programs for classes, packages in Python.
			CSL405.3	Understand text processing, file handling & database handling in Python.
			CSL405.4	Explore Graphical User Interface, Socket Programming and Django Framework in Python.
			CSL405.5	Understand basic concepts in Perl.
20	Microprocessor	CSC501	CSC501.1	Describe the architecture 8086/8088 microprocessor and interrupts.
			CSC501.2	Interpret instruction set of 8086 and write assembly and mixed language program in 8086.
			CSC501.3	Design 8086 based system using memory and peripheral chips.
			CSC501.4	Appraise the architecture of advanced processors.
21	Database Management	CSC502	CSC502.1	Identify the need of a database management systems

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	System		CSC502.2	Design and draw ER and EER diagram for the real life problem and convert conceptual model to relational model
			CSC502.3	Design and querying database using SQLand formulate relational algebra queries.
			CSC502.4	Analyze and apply concepts of normalization to relational database design
			CSC502.5	Illustrate the concept of transaction, concurrency and recovery management system
22	Computer Network	CSC503	CSC503.1	The student will be able to demonstrate the concepts of data communication at physical layer and compare ISO - OSI model with TCP/IP model.
			CSC503.2	The student will be able to demonstrate the knowledge of networking protocols at data link layer.
			CSC503.3	The student will be able to design the network using IP addressing and subnetting / super-netting schemes.
			CSC503.4	The student will be able to analyze various routing algorithms and protocols at network layer and transport layer
			CSC503.5	The student will be able to discuss protocols at application layer.
			CSC503.6	The student will be able to assess traffic requirements and perform capacity planning.
23	Theory of Computer Science	CSC504	CSC504.1	Identify the central concepts in theory of computation and differentiate between deterministic and nondeterministic automata, also obtain equivalence of NFA and DFA.
			CSC504.2	Infer the equivalence of languages described by finite automata and regular expressions.
			CSC504.3	Devise regular, context free grammars while recognizing the strings and tokens.
			CSC504.4	Design pushdown automata to recognize the language.
			CSC504.5	Develop an understanding of computation through Turing Machine & acquire fundamental understanding of decidability and undecidability.
24	Elective - Advance Algorithm	CSDLO5013	CSDLO5013.1	Describe analysis techniques for algorithms.
			CSDLO5013.2	Appreciate the role of probability and randomization in the analysis of algorithm
			CSDLO5013.3	Apply various operations on advanced data structure for different problems and analyze them

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			CSDLO5013.4	Identify appropriate algorithm to be applied for the various applications of network flow problems & analyze the algorithms.
			CSDLO5013.5	Identify appropriate algorithm to be applied for the various applications like geometric modeling, robotics etc & analyze the algorithms.
			CSDLO5013.6	Differentiate polynomial and non deterministic polynomial algorithms.
25	Elective - MultiMedia System	CSDLO5011	CSDLO5011.1	Identify basics of multimedia and multimedia system architecture and understand different multimedia components
			CSDLO5011.2	Explain file formats for different multimedia components and analyze the different compression algorithms
			CSDLO5011.3	Describe various multimedia communication techniques.
			CSDLO5011.4	Apply different security techniques in multimedia environment
26	Microprocessor Lab	CSL501	CSL501.1	Perform basic numeric operations using assembly language.
			CSL501.2	Perform various string and array operations using assembly language.
			CSL501.3	Use procedure and macro in assembly language program.
			CSL501.4	Write basic mixed language program.
27	Computer Network Lab	CSL502	CSL502.1	The student will be able to design and setup networking environment in Linux.
			CSL502.2	The student will be able to illustrate the use of basic networking commands in Linux.
			CSL502.3	The student will be able to use Network tools and simulators such as NS2, Wireshark etc. to explore networking algorithms and protocols
			CSL502.4	The student will be able to implement programs using core programming APIs for understanding networking concepts.
28	Database & Info. System	CSL503	CSL503.1	Design an ER /EER diagram for the real life problem and convert it into relational schema

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	Lab		CSL503.2	Create and update database and tables with different DDL and DML statements.
			CSL503.3	Apply integrity constraints to data and write simple and nested queries
			CSL503.4	Formulate join queries and write triggers and procedures for specific task
			CSL503.5	Develope a mini project using database connectivity
29	Web Design Lab	CSL504	CSL504.1	Understand the core concepts and features of Web Technology and design static web pages using HTML5 and CSS3.
			CSL504.2	Apply the concept of client side validation and design dynamic web pages using JavaScript and JQuery.
			CSL504.3	Evaluate client and server side technologies and create Interactive web pages using PHP, AJAX with database connectivity using MySQL.
			CSL504.4	Understand the basics of XML, DTD and XSL and develop web pages using XML /XSLT
			CSL504.5	Analyze end user requirements and Create web application using appropriate web technologies and web development framework
30	Business Comm. & Ethics	CSL505	CSL505-1	Design a technical document using precise language, suitable vocabulary and apt style.
			CSL505-2	Develop the life skills/interpersonal skills to progress professionally by building stronger relationships.
			CSL505-3	Demonstrate awareness of contemporary issues knowledge of professional and ethical
			CSL505-4	Apply the traits of a suitable candidate for a job/higher education , upon being trained in the techniques of holding a group discussion, facing interviews and writing resume/SOP.
			CSL505-5	Deliver formal presentations effectively implementing the verbal and non-verbal skills
31	Software Engineering	CSC601	CSC601.1	Understand and demonstrate basic knowledge in software engineering
			CSC601.2	Identify requirements, analyze and prepare models
			CSC601.3	Plan, schedule and track the progress of the projects and also design & develop the software projects
			CSC601.4	Identify risks, manage the change to assure quality in software projects and apply testing principles on software project and understand the maintenance concepts

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32	System Programming and Compiler Construction	CSC602	CSC602.1	To identify different system software and understand their functionality.
			CSC602.2	To write macros as and when required to increase readability and productivity
			CSC602.3	To use LEX and YACC tools for generating lexical analyzer and parsing.
			CSC602.4	To understand structure of compilers and the designing of parser for processing string
			CSC602.5	To appreciate role of Intermediate Code Generation in connection with language designing.
			CSC602.6	To apply optimization principles on given code. Consider the role of run time storage management.
33	Data Warehosing & Mining	CSC603	CSC603.1	Identify the need and acquire fundamental knowledge of data warehousing and data mining
			CSC603.2	Design data warehouse with dimensional modeling and apply OLAP operations
			CSC603.3	Analyze and identify appropriate data mining technique to solve real word problems
			CSC603.4	Outine complex data types with respect to spatial and web mining
34	Cryptography and System Security	CSC604	CSC604.1	Categorize system security goals and concepts, apply classical encryption techniques and acquire fundamental knowledge on the concepts of modular arithmetic and number theory.
			CSC604.2	Compare and apply different modern encryption and decryption techniques to solve problems related to confidentiality and authentication.
			CSC604.3	Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms to achieve integrity.
			CSC604.4	Apply different digital signature algorithm to achieve authentication.
			CSC604.5	Explore network and system security basics and analyze attacks on networks and system.
35	Elective - Machine Learning	CSDLO6021	CSDLO6021.1	Analyze and appreciate the applications which can use Machine Learning Techniques and understand the difference between supervised and unsupervised learning methods
			CSDLO6021.	apply regression and Decision tree algorithms

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			CSDLO6021.3	analyze optimization techniques,classification and clustering methods
			CSDLO6021.4	apply Dimensionality reduction techniques
36	Software Engineering Lab	CSL601	CSL601.1	Identify requirements and apply process model and create SRS for selected case study.
			CSL601.2	Analyze models for the selected case study using UML and DFD modeling.
			CSL601.3	Use various software engineering and software Testing tools.
			CSL601.4	create Technical project in a team and develop effective communication skills
37	System Software Lab	CSL602	CSL602.1	Generate machine code by using various databases generated in pass one of two pass assembler.
			CSL602.2	Construct different databases of macro processors and analyse loader functionality.
			CSL602.3	Identify and validate different tokens for given high level language code.
			CSL602.4	Parse the given input string by constructing Top down /Bottom up parser.
			CSL602.5	Implement synthesis phase of compiler with code optimization techniques.
38	Data Warehosing & Mining Lab	CSL603	CSL 603.1	Design data warehouse and perform various OLAP operations.
			CSL603.2	Analyze and apply data preprocessing on given data set
			CSL603.3	Implement classification, prediction, clustering and association rule mining algorithms
			CSL603.4	Experiment classifications, prediction, and clustering and association rule mining algorithms on a given set of data sample using different data mining tools.
			CSL603.5	Implement web mining algorithms.
39	System Security Lab	CSL604	CSL 604.1	Explore different attacks on network and system.
			CSL 604.2	Set up firewalls and intrusion detection systems using open source technologies and to explorer email & internet security.

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			CSL 604.3	Apply the knowledge of symmetric cryptography to implement simple ciphers.
			CSL 604.4	Analyze and implement public key algorithms like RSA.
			CSL 604.5	Analyze and evaluate performance of hashing algorithms.
40	Mini-Project I	CSM605	CSM605.1	illustrate practical Knowledge in Python Language
			CSM605.2	apply and predict using linear and logistic Regression Techniques
			CSM605.3	breakdown data using Decision Tree and K-Means Clustering Technique
			CSM605.4	explain Re-inforcement Learning and Pricipal Component Analysis for Dimension Reduction
			CSM605.5	create Technical project in a team and develop effective communication skills for presentation of project related activities
41	Digital Signal & Image Processing	CSC701	CSC701.1	Understand the concepts,analysis and classificationof DT signal and DT system in time domain.
			CSC701.2	implement Digital signal transform techniques DFT and FFT,
			CSC701.3	understand Enhancement Techniques of Digital Image Processing and Edge detection Techniques
			CSC701.4	Develop Projects of 1-D and 2-D Digital Signal Processing
42	Mobile Communication & Computing	CSC702	CSC702.1	Identify basic concepts and principles in mobile communication & computing, cellular architecture.
			CSC702.2	Describe the components and functioning of mobile networking and classify variety of security techniques in mobile network.
			CSC702.3	Apply the concepts of WLAN for local as well as remote applications and the concepts of mobility management
			CSC702.4	Describe mobility management, Long Term Evolution (LTE) architecture and its interfaces
43	Artifical Intelligence & Soft	CSC703	CSC703.1	To conceptualize the basic ideas and techniques of AI and SC

	Computing		CSC703.2	To distinguish various search techniques and to make student understand knowledge representations and planning
			CSC703.3	To become familiar with basics Neural networks and Fuzzy logics
			CSC703.4	To familiarize with hybrid systems and to build expert systems
44	Advance System Security & Digital Forensics	CSDLO7031	CSDLO7031.1	Understand cyber attacks and apply access control policies and control mechanisms.
			CSDLO7031.2	Understand and explore program security, OS security.
			CSDLO7031.3	Understand, detect and counter threats to Web Application.
			CSDLO7031.4	Understand the vulnerabilities of Wi-Fi networks and explore different measures to secure wireless protocols, WLAN and VPN networks.
			CSDLO7031.5	Understand the ethical and legal issues associated with cyber crimes and use different forensic tools to acquire and duplicate data from compromised systems and analyse the same.
45	Big Data & Analytics	CSDLO7032	CSDLO7032.1	Explain the motivation for big data systems and its associated applications for business decisions and strategy.
			CSDLO7032.2	Develop problem solving and critical thinking skills in fundamental enabling techniques like Hadoop HDFS & Mapreduce in big data analytics.
			CSDLO7032.3	Use different NoSQL data stores to collect, manage, store, query and analyze Big Data.
			CSDLO7032.4	Interpret business models and scientific computing paradigms, and apply software tools for big data analytics
			CSDLO7032.5	Adapt adequate perspectives of determining similar items and clustering in big data analytics
			CSDLO7032.6	Solve Complex real world problems in various applications like recommender systems, social media applications, health and medical systems, etc.
46	Disaster Management & Mitigation Measures	ILO7017	ILO7017-CO1	Get to know natural as well as manmade disaster & their extent and possible effect on economy.

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			ILO7017-CO2	Plan of national importance structures based upon the previous history.
			ILO7017-CO3	Get acquinted with Government policies,acts and various organisational structures
			ILO7017-CO4	Get to know simple do's and don'ts in such extreme events and act accordingly.
47	Digital Signal & Image Processing Lab	CSL701	CSL701.1	Understanding of Basic Software required.
			CSL701.2	Implement and apply operations like Convolution, Correlation, DFT and FFT on DT signals
			CSL701.3	Implement spatial domain Image enhancement techniques and Implement Edge detection techniques using first order derivative filters.
48	Mobile App Development Tech Lab	CSL702	CSL702.1	Students will be able to develop and demonstrate mobile applications using various tools
			CSL702.2	Students will articulate the knowledge of GSM, CDMA & Bluetooth technologies and demonstrate it
			CSL702.3	Students will be able to create database and develop security algorithms for mobile communication network
49	Artifical Intelligence & Soft Computing Lab	CSL703	CSL703.1	To realize the basic techniques to build intelligent systems
			CSL703.2	To create knowledge base and apply appropriate search techniques used in problem solving.
			CSL703.3	Apply the supervised/unsupervised learning algorithm.
			CSL703.4	Design fuzzy controller system.
50	Computational Lab - I	CSL704	CSL703.1	Understand the different tools used for big data management and its associated

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	(BDA)			applications in intelligent business and scientific computing.
			CSL703.2	Implement basic commands of various technologies of Hadoop Ecosystem.
			CSL703.3	Store,query and analyze data using NoSQL technology.
			CSL703.4	Implement various algorithms for big data analytics.
			CSL703.5	Implement different types of analytics using R.
51	Major Project - I	CSP705	CSP705.1	Identify and analyze problems in existing system and gather requirements of end user.
			CSP705.2	Identify and use modern tools for analysis and design to solve real world problem.
			CSP705.3	Communicate and work with engineers in team and the community at large in written and oral forms.
			CSP705.4	To develop and demonstrate the solution with good presentation and communication skills.
52	Human Machine Interaction	CSC801	CSC801.1	Apply the foundation and importance of human psychology in designing good interfaces
			CSC801.2	Recognize and apply the principles of interactive design and software processes
			CSC801.3	Apply the knowledge of interaction and communication styles for GUI and screen design
			CSC801.4	Develop interface design for mobile devices
53	Distributing Computing	CSC802	CSC802.1	Demonstrate knowledge of the basic elements and concepts related to distributed system technologies
			CSC802.2	Illustrate the middleware technologies that support distributed applications such as RPC, RMI and Object based middleware
			CSC802.3	Analyze the various techniques used for clock synchronization and mutual exclusion and Demonstrate the concepts of Resource and Process management and synchronization algorithms

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			CSC802.4	Demonstrate the concepts of Consistency and Replication Management and Apply the knowledge of Distributed File System to analyze various file systems like NFS, AFS and the experience in building large-scale distributed applications
54	Natural Language Processing	DLO8012	DLO8012.1	Model linguistic phenomena with formal grammar.
			DLO8012.2	Design, implement, and analyze NLP algorithm
			DLO8012.3	Apply NLP techniques to design real world NLP applications, such as machine translation
			DLO8012.4	Implement text categorization, text summarization, information extraction...etc.
			DLO8012.5	Implement proper experimental methodology for training and evaluating empirical NLP systems.
55	Human Resource Management	ILO8024	ILO8024.1	Understand the concepts, aspects, techniques and practices of the human resource management.
			ILO8024.2	Understand the Human resource management (HRM) processes, functions, changes and challenges in today's emerging organizational perspective.
			ILO8024.3	Acquire the knowledge about the latest developments and trends in HRM.
			ILO8024.4	Apply the knowledge of behavioral skills learnt and integrate it with in inter personal and intergroup environment emerging as future stable engineers and managers.
56	Environmental Management	ILO8029	ILO8029.1	Understand the concept of environmental managemen
			ILO8029.2	Understand ecosystem and interdependence,food chain etc
			ILO8029.3	Understand and interpret environment related legislations
57	Human Machine Interaction Lab	CSL801	CSL801.1	To design user centric interfaces
			CSL801.2	To design innovative and user friendly interfaces.
			CSL801.3	To apply HMI in their day-to-day activities.
			CSL801.4	To criticize existing interface designs, and improve them

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			CSL801.5	To Design application for social Task
			CSL801.6	To Design application for Technical Tasks
58	Distributing Computing Lab	CSL802		
			CSL802.1	Develop, test and debug client-server programs.
			CSL802.2	Implement the main underlying components of distributed systems (such as IPC,name resolution, file systems etc.)
			CSL802.3	Implement various techniques of synchronization.
			CSL802.4	Design and implement application programs on distributed systems.
59	Cloud Computing Lab	CSL803	CSL803.1	Adapt different types of virtualization and increase resource utilization.
			CSL803.2	Build a private cloud using open source technologies.
			CSL803.3	Analyze security issues on cloud and Develop real world web applications and deploy on commercial cloud
			CSL803.4	Demonstrate various service models.
60	Computational Lab - II (NLP)	CSL804	CSL804.1	Will be able to analyze field of natural language processing, its capabilities and limitations
			CSL804.2	Will be able to model linguistic phenomena with formal grammars Be able to Design, implement and test algorithms for NLP problems
			CSL804.3	Will be able to apply mathematical and linguistic foundations underlying approaches to the various areas in NLP
			CSL804.4	Be able to apply NLP techniques to design real world NLP applications such as machine translation, text, categorization, text summarization, information extraction...etc
61	Major Project - II	CSP805	CSP805.1	Identify and analyze problems in existing system and gather requirements of end user.

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			CSP805.2	Identify and use modern tools for analysis and design to solve real world problem.
			CSP805.3	Communicate and work with engineers in team and the community at large in written and oral forms.
			CSP805.4	To develop and demonstrate the solution with good presentation and communication skills.

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Computer Engineering PO Attainment AY 2019-20																	
	SUBJECT NAME	**SUBJECT CODE**	Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
1	Applied Mathematics -III	**CSC301**	0	0.96	0.56					0.41	0.4 8	0.48	0.48		0.48	0.48 2	
2	Digital Logic Design and Analysis	CSC302	3	2.28	2.13	1.98	2.03	2.28							**1.33**	2.28	1.82
3	Discrete Structures	CSC303	3	3	3		3								3	3	3
4	Electronic Circuits and Communication Fundamentals	CSC304	3	2.89	2.53	2.52 8	2.41	1.00			0.9 6		0.96		1.00	2.75	2
5	Data Structures	CSC305	3	**2.50**	**1.25**		**1.00**	**2.00**			**1.0 0**	**2.25**	**1.00**		**1.50**	1.2	1.2
6	Digital System Lab	CSL301	3	3.00	3.00	2.8	2.60	3.00			1.0 0		1.00		1.00		
7	Basic Electronics Lab	CSL302	3	3.00	3.00	3	3.00				1.0 0		1.00		2.00	2.5	2.5
8	Data structure Lab	CSL303	3	2.60	2.60	2.8	2.80	3.00			1.0 0	1.00	2.00		1.00		
9	OOPM(Java) Lab	CSL304	3	1.28	1.28	1.92	0.64	0.64			0.6 4		1.28				
10	Applied Mathematics- IV	CSC401	1	1.2	0.6	0.0	0.2	0.0	0.0	0.2	0.6	0.6	0.6	0.0	0.6	0.6	
11	Analysis of Algorithms	CSC402	2	1.20	1.50	1.2	1.65				0.6 0		0.60			2.66 7	2.33 3
12	Computer Organization and Architecture	CSC403	2	2.15	2.15	1.43	1.43				0.7 2		0.72		1.43		
13	Computer Graphics	CSC404	3	2.00	1.50	1	1.00				1.0 0		1.00		1.00	0.84	1.08
14	**Operating System**	CSC405	3	**3.00**	**1.00**	**0.75**	**1.25**	**0.00**	**0.00**	**0.00**	**0.0**	**0.00**	**0.00**	**0.00**	**1.00**	**2**	**1**

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											0						
15	Analysis of Algorithms Lab	CSL401	3	1.73	1.73	1.73	2.25	2.17			0.87		0.87			3	3
16	Computer Graphics Lab	CSL402	3	2.6	2.6	2.6	2.6	1.73			0.86		0.86		1.73	1.2	1.2
17	Processor Architecture Lab	CSL403	3	1.52	1.52	0.76	0.76	1.52			0.76	1.52	1.71		0.95		
18	Operating System Lab	CSL404	3	0.97	1.60	0	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	1.93	0.97
19	Open Source Tech Lab	CSL405	3	1.41	1.41	1.41	1.60	1.28			0.64		0.64		1.28	3	3
20	Microprocessor	CSC501	3	**3.00**	**2.80**	**2.5**	**1.80**	**1.75**			**1.00**		**1.00**		**1.00**	1.25	1.25
21	Database Management System	CSC502	3	2.3	2.1	2.3	1.8	1.5							2.4	2.5	2.5
22	Computer Network	CSC503	3	**3.00**	**3.00**	**3**	**3.00**		**3.00**		**3.00**		**3.00**		**3.00**	1.5	1.5
23	Theory of Computer Science	CSC504	2	3.00	3.00	3	3.00		3.00		3.00		3.00		3.00	1.5	2.1
24	Elective - Advance Algorithm	CSDLO5013	2	**2.29**	**2.29**	**2.112**	**1.17**	**0.88**	**1.76**	**0.88**	**0.88**	**2.64**	**1.41**	**0.88**	**0.88**	1.5	2
25	Elective - MultiMedia System	CSDLO5011	2	**1.63**	**1.69**	**1.691**	**1.70**	**1.65**	**1.66**	**1.66**	**1.66**		**1.64**		**1.66**	1.25	1.25
26	Microprocessor Lab	CSL501	3	3.00	3.00	1	1.00	1.00			1.00	2.00	2.00		1.25	1.50	1.5
27	Computer Network Lab	CSL502	3	2.2	2.2	2	2.2	2.6	3	3	3	3	3	3	3	1.5	1.5
28	Database & Info. System Lab	CSL503	2	2.30	2.10	2.3	1.80	1.50							2.40	2.3	2.3
29	Web Design Lab	CSL504	3	**2.67**	**2.67**	**2.333**	**2.00**		**1.00**	**1.00**	**1.00**		**1.17**	**1.67**	**1.50**		
30	Business Comm. & Ethics	CSL505	2	**3.00**	**3.00**	**3**	**3.00**	**3.00**			**3.00**	**3.00**	**3.00**		**3.00**	**3**	**3**
31	Software Engineering	CSC601	3	**2.67**	**2.17**	**2.17**	**2.00**				**1.00**		**1.00**		**1.00**	1.3	1.25

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32	System Programming and Compiler Construction	CSC602	3	**3.00**	**3.00**	**3**	**3.00**		**3.00**		**3.00**		**3.00**		**3.00**	2.3	2.3
33	Data Warehosing & Mining	CSC603	3	3.00	3.00	3	3.00	3.00					3.00		3.00	3	3
34	Cryptography and System Security	CSC604	3	**1.97**	**1.97**	**2.064**	**1.38**	**1.38**			**0.70**	**2.06**	**1.97**	**1.52**	**0.70**	3	3
35	Elective - Machine Learning	CSDLO6021	2	2.28	2.28	2.2	2.40	2.40			2.40	2.40	2.40		2.40	2.4	2.4
36	Software Engineering Lab	CSL601	3	**2.50**	**2.33**	**2.67**	**2.67**	**2.67**			**1.00**		**2.00**		**1.00**	2.3	2.3
37	System Software Lab	CSL602	3	**1.63**	**1.69**	**1.691**	**1.70**	**1.65**	**1.66**	**1.66**	**1.66**		**1.64**		**1.66**		
38	Data Warehosing & Mining Lab	CSL603	3	**3.00**	**3.00**	**3**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	3	3
39	System Security Lab	CSL604	2	3.00	3.00	3	3.00	3.00				3.00	3.00		3.00	3	3
40	Elective - Soft Computing	CPE70425	2	1.32	2.20	0.73	0.73	1.61	1.91		1.32	0.73	1.47		1.47	2.20	2.2
41	Mini-Project I	CSM605	3	3.00	3.00	3	3.00	3.00			1.00		1.00		3.00	1.667	1.2
42	Digital Signal & Image Processing	CSC701	3	2.00	2.25	2.5	2.25	3.00			1.00		2.00			1.75	1
43	Mobile Communication & Computing	CSC702	3	2.5	1.5	1.3	1.3	1.5			1.0	1.5	1.3		1.3	1.3	1.3
44	Artifical Intelligence & Soft Computing	CSC703	2	**1.80**	**1.80**	**1.8**	**1.80**	**1.80**	**1.80**		**1.80**	**1.80**	**1.80**	**1.80**	**1.80**	1.8	1.8
45	Advance System Security & Digital Forensics	CSDLO7031	2	3.00	3.00	2.6	2.00	2.60	1.00		2.00	1.00	2.00	1.00	2.00	3.0	3
46	Big Data & Analytics	CSDLO7032	3	1.75	2.00	2	1.75	2.33	2.00			2.00	2.00		1.75	2	2.25
47	Management Information System	ILO7013	2	2.00	2.00	1.25	2.25	1.00		1.33	1.00		1.00		1.00		
48	Disaster Management & Mitigation Measures	ILO7017	3	1.00					3.0	3.0	1.0	1.0	2.0	1.5	1.0	3.0	3.0
49	Digital Signal & Image	CSL701	3	**3.00**	**3.00**	**3**	**3.00**	**3.00**	**3.00**	**3.00**	**3.0**	**3.00**	**3.00**	**3.00**	**3.00**	2	1

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	Processing Lab										0						
50	Mobile App Development Tech Lab	CSL702	3	2.5	1.5	1.3	1.3	1.5			1.0	1.5	1.3		1.3	1.3	1.3
51	Artifical Intelligence & Soft Computing Lab	CSL703	3	2.0	2.8	3.0	1.3	1.5	2.5		2.3	2.0	2.0	1.3	2.3	1.3	2.3
52	Computational Lab - I (BDA)	CSL704	3	2.0	3.0	2.8	2.0	2.8	2.0	#####	2.0	2.0	2.0	1.0	3.0	3	2.8
53	Major Project - I	CSP705	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
54	Human Machine Interaction	CSC801	0	3.0	3.0	3.0	3.0										
55	Distributing Computing	CSC802	2.5	1.3	1.3	1.5			1.0	1.5	1.3		1.3	1.3	1.3	1.3	1.25
56	Natural Language Processing	DLO8012	2	2.0	2.6	0.6	3.0	2.0			1.0				1.8	1	1
57	Human Resource Management	ILO8024	3	1.8	1.8	2.0	2.5		1.8	1.0	1.0				1.0	2	1.333
58	Environmental Management	ILO8029	2				3.0	3.0	1.5	1.0	2.0	1.0	1.0	3.0	3.0	3	3
59	Human Machine Interaction Lab	CSL801	3	1.5	2.0	-	2.0	-	0.2	-	-	-	-	-	1.2	2	0
60	Distributing Computing Lab	CSL802	3.0	3.0	3.0	3.0		3.0							3.0	3	3
61	Cloud Computing Lab	CSL803	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3	3
62	Computational Lab - II (NLP)	CSL804	3	3.0	2.6	2.0	3.0	2.0			1.0				1.8	2	1
63	Major Project - II	CSP805	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3	3
			2.614	2.296	2.258	2.095	2.101	1.966	1.886	#####	1.42	1.818	1.664	1.69	1.83	2.08	2.001

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		Course Information	(2019-20) EXTC		
Sr. No.	SEM	Course Name	Code	CO No	COs The students will be able to
1	III	Applied Mathematics-III	ECC301	ECCC302.1	use Laplace transform to solve initial value problems
				ECC301-2	represent a given periodic function in Fourier series and can evaluate a number series
				ECC301-3	use bilinear transformations for finding image of curves
				ECC301-4	evaluate directional derivative,curl and divergence of vector field
				ECC301-5	use recurrence relation of Bessel function, generating function, expression for sin(xsinθ), cos(xsinθ) in terms of Bessel function
2	III	Electronic Devices and Circuits I	ECC302	ECCC302.1	understand operation and applications of diodes, regulators, transistors in order to design basic circuits.
				ECCC302.2	analyze various biasing circuits for BJT and FET.
				ECCC302.3	design and demonstrate a small signal model of BJT and JFET amplifiers.
				ECCC302.4	design, construct and characterize electric and electronic circuits according to specification.
3	III	Digital System Design	ECC303	ECC303.1	**Analyze** and design combinational logic circuits.
				ECC303.2	**Differentiate** characteristics and working of TTL and COMS logic families.
				ECC303.3	**Analyze** and design sequential logic circuits.
				ECC303.4	**Classify** and characterize different semiconductor memories

				ECC303.5	**Analyze** and design digital systems using PLD.
4	III	Circuit Theory and Networks	ECC304	ECC305.1	Apply their **knowledge** in **analyzing**circuits by using different network theorems.
				ECC305.2	Understand the basic concepts of graph and **analyze** the basic electrical circuits using graph theory.
				ECC305.3	Apply the time and frequency response for analysis of the network.
				ECC305.4	**Understand** various functions of network and also the stability of network
				ECC305.5	Find the various parameters and their interrelationship using two port parameters
				ECC305.6	Synthesize the network using passive elements
5	III	Electronic Instrumentation and Control	ECC305	ECC305.1	**UNDERSTAND** the Principle of Measurement, Testing and Measuring instruments
				ECC305.2	**EXPLAIN** principle of operation for various sensors.
				ECC305.3	**DESCRIBE** functional blocks of data acquisition system.
				ECC305.4	**DETERMINE** transfer function of given control system using block diagram reduction techniques and masons gain formula.
				ECC305.5	**DETERMINE** stability of given control system using time and frequency response analysis.
6	III	Electronic Devices and Circuits I Laboratory	ECL301	ECL301.1	verify the working of different diodes, transistors and measuring instruments.
				ECL301.2	learn the characteristics of semiconductor devices like diodes, BJT and FET.
				ECL301.3	analyze the amplifier design with semiconductor devices.
				ECL301.4	understand the concepts of simulation by using Multisim.

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7	III	Digital System Design Laboratory	ECL302	ECL302.1	**Design and implement** combinational logic circuits.
				ECL302.2	**Design and implement** sequential logic circuits.
				ECL302.3	**Demonstrate** simulation and implementation of combinational and sequential circuits using VHDL systems.
				ECL302.4	**Develop** a digital logic and apply it to solve real life problems.
8	III	OOP using JAVA Laboratory	ECL303	ECL303.1	code a program using JAVA constructs
				ECL303.2	formulate a program that correctly implements the algorithm
				ECL303.3	generate different patterns & flows using control structures & recursion in their programs
				ECL303.4	use thread methods, thread exception & thread priority
9	IV	Applied Mathematics-IV	ECC401	ECC 401-1	Find eigenvalues and eigenvectors of a given square matrix of order 2X2,3X3.
				ECC 401-2	Find complex integration about closed curve
				ECC 401-3	Find Correlation Coefficient between two variables
				ECC 401-4	Identify and apply distributions to the given problems
				ECC 401-5	Use Euler Lagrange equation to find extremal of functionals
				ECC 401-6	Construct orthonormal basis of a vector space by applying Gram Schmidth process
10	IV	Electronic Devices and Circuits II	ECC402	ECC402.1	analyze the basic operations of MOSFET.
				ECC402.2	demonstrate and analyze multistage amplifiers using BJT and FET.
				ECC402.3	describe different types of power amplifier.
				ECC402.4	describe concept of feedback amplifier.
				ECC402.5	demonstrate and design various oscillator circuits.

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11	IV	Linear Integrated Circuits	ECC403	ECC402-1	A thorough **understanding** of operational amplifiers with linear integrated circuits and its applications
				ECC402-2	To **design** circuits using OP AMP for various applications
				ECC402-3	State, analyse and understand the different A/D and D/A converters.
				ECC402-4	To **analyse** and **design** different IC'S
12	IV	Signals & Systems	ECC404	ECC404.1	understand various different types of signals and systems, classify, analyze and apply different operations on signals and sketch the results.
				ECC404.2	use convolution operation to determine the response of LTI systems (both CT and DT) to arbitrary inputs.
				ECC404.3	state and apply Laplace transform, z- transform and Fourier transform to analyze and determine response of LTI system.
				ECC404.4	Realize the LTI system in various forms and understand the system properties.
				ECC404.5	evaluate response of systems to investigate requirements in signal processing, communication and control system applications.
13	IV	Principles of Communication Engineering	ECC405	ECC405.1	describe and apply basic concepts of communication systems
				ECC405.2	analyze and compare different modulation techniques and transmitters in analog communication
				ECC405.3	analyze and compare different demodulation techniques and receivers in analog communication
				ECC405.4	discuss applications of various modulation techniques
14	IV	Electronic Devices and Circuits II Laboratory	ECL401	ECL401.1	analyze the basic operation of MOSFET amplifiers.
				ECL401.2	understand multistage amplifiers in various configurations.
				ECL401.3	understand the concept of power amplifier.

				ECL401.4	demonstrate RC and LC oscillator using Multisim.
15	IV	Linear Integrated Circuits Laboratory	ECL402	ECL402.1	Analyze and design different applications of OPAMP
				ECL402.2	Design different applications of OPAMP
				ECL402.3	Analyse different applications of different ICs
16	IV	Principles of Communication	ECL403	ECL403-1	Identify and use different analog and digital modulation and demodulation
		Engineering Lab			techniques to solve basic communication problems.
				ECL403-2	demonstrate different concepts in analog communication systems with simulation.
				ECL403-3	design and implement simple circuits for real life applications.
17	V	Microprocessor & Peripherals Interfacing	ECC501	ECC501.1	The students will be able to Decribe the architectural basics of Microprocessor (8086) in the field of Embedded System (Level 2-Understand)
				ECC501.2	The students will be able to Implement assembly language programs for the 8086 microprocessor. (Level3 – Apply)
				ECC501.3	The students will be able to Examine the interface between various peripheral devices and memories to 8086. (Level 4 – Analysis)
				ECC501.4	The students will be able to describe a microprocessor based embedded system for complex mathematical operations(Level 2 – Understand)
18	V	Digital Communication	ECC502	ECC502.1	To describe the concepts of information theory and coding techniques used in digital data transmission
				ECC502.2	To calculate the performance of different error control coding schemes like LBC, CRC and Convolution coding
				ECC502.3	To compare the various band pass modulation & demodulation methods used for digital data transmission
				ECC502.4	To compare different baseband transmission and detection methods used for digital communication.

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19	V	Electromagnetic Engineering	ECC503	ECC503.1	**Describe** and **analyse** the behaviour of static electric fields in standard configurations and different material space and explain its applications.
				ECC503.2	**Understand** magnetostatic fields, and **analyse** magnetic forces on charges, wires, and different media and explain its applications.
				ECC503.3	**Explain** and **analyse** time varying fieldsand electromagnetic wave propagation and its applications.
				ECC503.4	**Describe** and **analyse** transmission lines and explain its applications.
20	V	Discrete Time Signal Processing	ECC504	ECC504.1	Use appropriate properties of DFT for discrete time LTI system analysis.
				ECC504.2	apply the knowledge to design digital FIR and IIR filters using appropriate methods.
				ECC504.3	Analyze the effect of finite word length and quantization in DSP.
				ECC504.4	Demonstrate fundamental principle and techniques of DSP processors.
				ECC504.5	Apply the knowledge DSP for various applications of DSP in EEG, DTMF and RADAR.
21	V	TV & Video Engineering	ECCDLO 5012	ECCDLO 5012.1	explain fundamentals and working of monochrome television
				ECCDLO 5012.2	explain fundamentals and working of colour television
				ECCDLO 5012.3	explain different display and streaming media devices
				ECCDLO 5012.4	
22	V	Data Compression and Encryption	ECCDLO 5014	ECCDLO5014-1	Analyze lossless and lossy compression techniques for text compression

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				ECCDLO 5014-2	Implement audio compression techniques and image compression techniques.
				ECCDLO 5014-3	Categorize data encryption techniques.
				ECCDLO 5014-4	Discuss and understand key cryptography techniques and system security.
23	V	Microprocessor & Peripherals Interfacing Lab	ECL501	ECL501.1	The students will be able to Implement assembly language program using 8086 (Level 3-application)
				ECL501.2	The students will be able to Demonstrate assembly language programs for interfacing various types of peripheral device like motors,LED's(Level 3 - Application)
24	V	Digital Communication Lab	ECL502	ECL502.1	to calculate the different coding parameters used in information theory for digital communication systems.
				ECL502.2	to calculate the performance of different error control coding schemes
				ECL502.3	to compare the various band pass modulation & demodulation methods used for digital data transmission
				ECL502.4	to calculate the inter symbol interference for baseband transmission technique
25		Business Communication & Ethics Lab	ECL503	ECL503.1	Design a technical document using precise language, suitable vocabulary and apt style.
				ECL503.2	Develop the life skills/interpersonal skills to progress professionally by building stronger relationships
				ECL503.3	Demonstrate awareness of contemporary issues knowledge of professional and ethical responsibilities
				ECL503.4	Apply the traits of a suitable candidate for a job/higher education, upon being trained in the techniques of holding a group discussion, facing interviews and writing resume/SOP.
				ECL503.5	Deliver formal presentations effectively implementing the verbal and non-verbal skills

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26	V	Open Source Technology for Communication Lab	ECL504	ECL504.1	Demonstrate open source programming tools commonly used for Electronics and Telecommunication Engineering.
				ECL504.2	Simulate and analyze the performance of signal processing in OCTAVE.
				ECL504.3	Simulate and analyze the performance of Communication in Python.
				ECL504.4	Simulate and analyze the performance of Electronics circuits and devices in Xilinx and LT spice.
27	V	TV & Video Engineering	ECLDLO 5012	ECLDLO5012.1	understand working of Monochrome TV and to analyze TV camera tubes.
				ECLDLO5012.2	explain the working of Colour TV and compare various colour CRT TV systems.
				ECLDLO5012.3	describe compression techniques with its applications
				ECLDLO5012.4	discuss different DVB standards to explain advanced digital TV systems.
				ECLDLO5012.5	compare working principles of the latest digital TV.
				ECLDLO5012.6	classify the working principles of latest displays like LCD, LED.
28	V	Data Compression and Encryption	ECLDLO501 4	ECLDLO 5014.1	Implement lossless compression techniques and interpret results.
				ECLDLO 5014.2	Implement Image compression techniques.
				ECLDLO 5014.3	Implement Audio compression techniques using ৷- law and A-law companding.
				ECLDLO 5014.4	Understand symmetric and asymmetric key cryptography techniques.
29	V	Microcontrollers & Applications	ECC601	ECC601.1	Demonstrate the architectural basics of different microcontroller
				ECC601.2	Write assembly language programs for the 8051 and ARM 7 microcontrollers.
				ECC601.3	Interface various peripheral devices to the microcontrollers

				ECC601.4	Create a microprocessor based embedded system for practical applications
30	VI	Computer Communication Networks	ECC602	ECC-602.1	**Understand** computer network basics, network architecture, TCP/IP and OSI reference models.
				ECC-602.2	**Identify** and **understand** various techniques and modes of transmission.
				ECC-602.3	**Describe** data link protocols, multi-channel access protocols and IEEE 802 standards for LAN.
				ECC-602.4	**Describe** routing and congestion in the network layer with routing algorithms and **discuss** the protocols of the transport layer.
31	VI	Antenna & Radio WavePropagation	ECC603	ECC603.1	describe the concept of antenna fundamentals and its radiation effects
				ECC603.2	classify about linear wire, aperture and patch types of antennas
				ECC603.3	calculate antenna parameters for array and special types of configuration.
				ECC603.4	describe the concepts of various methods of waves propagation
32	VI	Image Processing and Machine Vision	ECC604	ECC604.1	Summarize and make use of the theory and models in Image Processing.
				ECC604.2	Analyze Images in frequency domain through different Image transforms.
				ECC604.3	Analyze spatial and frequency domain techniques for image enhancement and Image restoration.
				ECC604.4	Examine the concepts of Image segmentation and image morphology.
				ECC604.5	Find shape using various representation techniques and classify the object using different classification methods.
33	VI	Database Management System	ECCDLO 6023	ECCDLO 6023.1	Understands the fundamentals of Database management system.
				ECCDLO 6023.2	Design and draw ER/EER/UML diagrams for real life problems and transform an information model into a relational schema and apply concepts of Normalization to relational schema.
				ECCDLO 6023.3	Create and querying database using Relational algebra and SQL

				ECCDLO 6023.4	Understand the concepts of constraints, views, concurrency control and deadlock.
34	VI	Microcontroller & Applications lab	ECL601	ECL601.1	The students will be able to execute programs for arithmetic operations (Level 3-application)
				ECL601.2	The students will be able to Implement assembly language programs for 8051 (Level3 -Apply)
				ECL601.3	The students will be able to demonstrate programs for interfacing various peripheral and display devices(Level 3- Application)
				ECL601.4	The students will be able to execute programs using advanced processor like ARM7 for practical application(Level 3- Apply)
35	VI	Computer Communication Network Lab	ECL602	ECL602-1	Identify and use various networking components Understand different transmission media and design cables for establishing a network
				ECL602-2	Emulate any topology by configuring network devices in windows and Linux platform.
				ECL602-3	Understand the TCP/IP configuration, communication and network performance.
36	VI	Antenna & Radio Wave Propagation Lab	ECL603	ECL603.1	describe the concept of antenna fundamentals
				ECL603.2	describe radiation patterns of different wire, aperture and micro strip types of antennas
				ECL603.3	describe radiation patterns of different array types of antennas.
				ECL603.4	simulate different types of antennas.
37	VI	Image Processing and Machine	ECL604	ECL604.1	Demonstrate basic operations on images.

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		Vision Lab		ECL604.2	Demonstrate effect of different image enhancement techniques in special and frequency domain on images.
				ECL604.3	Demonstrate the use of image segmentation and morphological techniques on images.
				ECL604.4	Develop/Discuss any image processing application.
38	VI	Database Management System Lab	ECLDLO602 3	ECLDLO60 23.1	Identify the case study and detail problem statements. Design ER/EER Model.
				ECLDLO60 23.2	Convert ER/EER to relational schema model.
				ECLDLO60 23.3	Create and populate databases using DDL commands.
				ECLDLO60 23.4	Create and populate databases using DML commands.
				ECLDLO60 23.5	Apply Integrity constraints for the specified system.
				ECLDLO60 23.6	Perform simple queries and string manipulation operations.
39	VI	Microwave Engineering	ECC701	ECC-701-1	Characterise devices at higher frequencies
				ECC-701-2	Design and analysis of transmission lines,microwave circuits & waveguides
				ECC-701-3	Design and analysis amplifiers , oscillators at microwave frequencies
				ECC-701-4	Analysis of microwave measurements , skills of planning & deployment of microwave network with help of microwave integrated circuits
40	VI	Mobile Communication System	ECC702	ECC702.1	Explain the cellular radio concepts and to classify different propagation models with link budget analysis.
				ECC702.2	Illustrate fundamental concepts and system architecture of GSM, GSM evolution and IS-95
				ECC702.3	Describe 3G technologies and 3GPP LTE with their architecture, logical and physical channels characteristics and limitations.
				ECC702.4	Discuss emerging technologies for 4G mobile systems.
				ECC703.1	**List, write and explain** fundamentals and transmission characteristics of optical fiber communication

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41	VI	Optical Communication	ECC703	ECC703.2	**Estimate** the losses and analyze the propagation characteristics of an optical signal in different types of fibers
				ECC703.3	**Explain** principles and characteristics of various optical sources and detectors
				ECC703.4	**Calculate** parameters for optical link budgeting and analyze the link various fiber optic components
42	VII	Internet Communication Engineering	ECCDLO703 3	ECCDLO-7033.1	Analyze the features & operations of various application layer protocols such as DHCP, DNS, HTTP
				ECCDLO-7033.2	Analyze performance of various communication protocols.
				ECCDLO-7033.3	Design and analyze the issues with addressing (classful & classless).
				ECCDLO-7033.4	Develop SSL or firewall based solutions against security threats and understand the system design principles of multimedia communication system
43	VII	Institute Level Optional Course I **Management Information System**	ILO7013	ILO7013.1	Identify the impact of the Information System on an organisation to transform into business.
				ILO7013.2	Describe IT infrastructure, its components and its current trends.
				ILO7013.3	Understand the principal tools and technologies for accessing information from databases to improve business performance and decision making.
				ILO7013.4	Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses.
46	VII	Mobile Communication System Lab	ECL702	ECL702.1	Apply the cellular radio concepts for designing mobile communication systems.
				ECL702.2	Demonstrate propagation models related to losses and different types of fading.
				ECL702.3	Understand the CDMA system with generation of pseudo random numbers.
				ECL702.4	Develop the concepts of emerging technologies for 4G standards and beyond.

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48	VII	Optical Communication Lab	ECL703	ECL703.1	**Estimate** different fiber parameters (V-number, Numerical aperture, Acceptance Angle) in Optical Link.
				ECL703.2	**Analyze** different types of losses (attenuation, bending and dispersion) in optical fibers.
				ECL703.3	**Analyze** characteristic curve of optical source and detector.
				ECL703.4	**Estimate** Power margin and bit rate using optical link budget analysis for given parameters
				ECL703.5	**Explore** concept of WDM by establish a duplex communication link between two computers using optical link
49	VII	Neural Networks and Fuzzy Logic Lab	ECLDLO 7031	ECLDLO 7031.1	Comprehend the concepts of biological neurons and artificial neurons o o o o
				ECLDLO 7031.2	Analyze architecture of feed-forward and feedback neural networks and their learning algorithms
				ECLDLO 7031.3	Analyze application of neural networks to real world problem
				ECLDLO 7031.4	Comprehend the concept of fuzziness involved in various systems, fuzzy set theory and fuzzy logic
				ECLDLO 7031.5	Apply fuzzy logic to real world problems
50	VII	Internet Communication Engineering	ECLDLO 7033	ECLDLO-7033.1	analyze performance of various communication protocols for congestion control orchestration using learned software tools.
				ECLDLO-7033.2	install and configure different servers & observe operation of various application layer protocols such as DHCP, DNS, TELNET, SSH.
				ECLDLO-7033.3	analysis of multimedia protocols by packet capturing using software tools and also identifies different compression techniques.
51	VII	Project Stage I	ECL704	ECL704.1	identify and define problem statements by doing literature surveys with awareness of impact on the society and environment.
				ECL704.2	demonstrate strong working knowledge and ethical use of necessary modern tools.
				ECL704.3	analyze complex problems and design appropriate engineering solutions by applying the

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					technical knowledge gained from previous courses taking into consideration the factors like timeline, available resources, risk and quality.
				ECL704.4	Express teamwork, creative skills and innovative qualities when working rationally towards completion of the project.
				ECL704.5	Present the completed work, the results obtained and prepare an interim report in specified format.
52	VII	RF Design	ECC801	ECC801.1	**Analyze** and **Design** RF Filters using Image parameter and Insertion loss method
				ECC801.2	**Analyze** and **Design** Single stage amplifier and Power amplifiers
				ECC801.3	**Analyze** Microwave Oscillators and Mixers
				ECC801.4	**Analyze** Frequency Synthesizers
				ECC801.5	**Analyze** Electromagnetic Interference in RF circuits
				ECC801.6	**Analyze** Electromagnetic Compatibility in RF circuits
53	VIII	Wireless Networks	ECC802	ECC801.1	**Analyze** the fundamentals, architecture, design issues and standards of wireless networks.
				ECC801.2	**List** and **compare** Body Area networkBAN and personal area network PAN and **analyze** with applications.

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				ECC801.3	**Evaluate** different WLAN and WMAN topologies and technologies with fundamentals and architecture
				ECC801.4	**Analyze and Evaluate** various wireless adhoc network architecture, traffic related protocols and transmission technology and **Analyze** the basic architecture and working of IoT and **Design IoT based applications.**
54	VIII	Satellite Communication	ECLDLO 8043	ECCDLO8043.1	**Explain** basics of satellite communication, space segment and earth segment
				ECCDLO8043.2	**Understand** principle, working and operationof various sub-systems of satellite as well as the earth station
				ECCDLO8043.3	**Analyze** and **Design** Satellite Communication Link
				ECCDLO8043.4	Apply various communication techniques for satellite applications
				ILO8024.1	Understand the concepts, aspects, techniques and practices of the human resource management.
55	VIII	Human Resource Management	ILO8024	ILO8024.2	Understand the Human resource management (HRM) processes, functions, changes and challenges in today's emerging organizational perspective.
				ILO8024.3	Acquire knowledge about the latest developments and trends in HRM
				ILO8024.4	Apply the knowledge of behavioral skills learnt and integrate it with in inter personal and intergroup environment emerging as future stable engineers and managers.
				ILO8021.1	Apply selection criteria and select an appropriate project from different options.
				ILO8021.2	Write work break down structure for a project and develop a schedule based on it.
56	VIII	Project Management	ILO8021	ILO8021.3	Identify opportunities and threats to the project and decide an approach to deal with them strategically.

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				ILO8021.4	Use Earned value technique and determine & predict status of the project.
				ILO8021.5	Capture lessons learned during project phases and document them for future reference
57	VI	RF Design Lab	ECL801	ECL801.1	Analyze RF Filters
				ECL801.2	Analyze RF Amplifiers
				ECL801.3	Analyze Microwave Oscillators and Mixers
				ECL801.4	Analyze Frequency Synthesizers
				ECL801.5	Analyze Electromagnetic Interference in RF circuits
				ECL801.6	Analyze Electromagnetic Compatibility in RF circuits
58	VI	Wireless Networks Lab	ECL802	**ECL802.1**	Study, discuss and install different network simulation tools such as NSG, NS2/NS3, Netstumbler, Wireshark, XCTU etc.
				ECL802.2	Analyze WPAN, WMAN, WLAN, wireless ad-hoc network for various network metrics with AWK script in NS2.
				ECL802.3	Analyze link budget for GSM and CDMA networks.
59	VIII	Satellite Communication Lab	ECCDLO804 3	ECLDLO8043.1	**Understand** the concept of uplink and downlink frequency used to transmit and receive different types of signals through satellite link.
				ECLDLO8043.2	**Analyze** telemetry, tracking, Command sub system and calculate figure of merit using S/N and C/N ratio.
				ECLDLO8043.3	**Estimate** Bit Error Rate (BER) by setting up a Serial satellite communication link (PC-PC Communication) using USB ports.
				ECLDLO8043.4	**Analyze** the effect of varying parameters like propagation delay and fading on received signal.

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60	VIII	Project Stage II	ECL803	ECL803.1	demonstrate strong working knowledge and ethical use of necessary modern tools.
				ECL803.2	develop working model for the proposed system resulting in at least one quality publication.
				ECL803.3	analyze complex problems and design appropriate engineering solutions by applying the technical knowledge gained from previous courses taking into consideration the factors like timeline, available resources, risk and quality.
				ECL803.4	Express teamwork, creative skills and innovative qualities when working rationally towards completion of the project

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Program Outcome for 2019-20 Batch															
			PO Attainment												
Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ECC301	Applied Mathematics- III	3.00	2.60	1.00					1.00	1.00			1.00	1.60	1.00
ECC302	Electronic Devices and Circuits I	2.64	1.76	1.98	1.98									1.98	1.98
ECC303	Digital System Design	2.02	2.13	2.13									1.33	1.33	1.42
ECC304	Circuit Theory and Networks	2.28	1.52	1.52										0.76	0.76
ECC305	Electronic Instrumentation and Control	3.00	2.33	2.00	2.00						1.00			3.00	1.60
ECL301	Electronic Devices and Circuits I Laboratory	2.64	2.20	2.20		1.76				0.88			0.88	1.76	1.76
ECL302	Digital System DesignLaboratory	3.00	3.00	3.00	2.00	2.50			2.00	3.00	3.00	2.00	2.00	2.00	2.00
ECC401	Applied Mathematics- IV	2.82	1.88	1.27									1.27	1.55	
ECC402	Electronic Devices and Circuits II	2.40	2.00	2.40	1.20									2.40	2.80
ECC404	Signals & Systems	2.80	2.60	2.00	2.20								1.00	3.00	2.20
ECL401	Electronic Devices and Circuits II Laboratory	3.00	2.00	1.50		2.00				2.00	1.25	1.00	1.00	2.00	1.25
ECC501	Microprocessor & Peripherals Interfacing	3.00	2.00	1.50							1.00		1.00	3.00	2.00
ECC502	Digital Communication	1.87	1.34	0.82						0.76			0.67	2.01	2.01
ECC504	Discrete Time Signal Processing	2.00	2.00	2.00	1.00									2.00	1.00
ECCDLO 5012	**TV & Video Engineering**	2.20	2.00	1.50						2.00	2.00		1.00	2.50	2.00
ECCDLO 5014	**Data Compression and Encryption**														
ECL501	Microprocessor & Peripherals Interfacing Lab	2.70	0.90	0.90	2.00	0.90					0.90			2.70	2.70
ECL502	Digital Communication Lab	1.98	1.32	0.88	0.88	0.88								2.64	2.64
ECL503	Business Communication & Ethics Lab		1.00				2.00		1.00	2.00	3.00		1.00		
ECL504	Open Source Technology for Communication Lab	3.00	3.00	3.00	3.00	3.00	0.00	0.00	3.00	3.00	3.00	3.00	0.00	3.00	3.00
ECLDLO 5012	**TV & Video Engineering Lab**	3.00	2.00	1.67	1.67	1.00				2.00	1.00			3.00	2.00
ECLDLO	**Data Compression and Encryption Lab**														

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5014															
ECC601	Microcontrollers & Applications	3.00	2.00	2.00							1.00		1.00	3.00	2.75
ECC603	Antenna & Radio Wave Propagation	2.75	2.00	2.00	1.25								1.00	2.00	2.00
ECC604	Image Processing and Machine Vision	2.60	2.60	2.60	2.60	-	-	-	-	-	2.60	-	2.60	2.60	2.60
ECCDLO 6023	**Database Management System**	2.00	2.00	2.00	2.00	2.00							3.00		
ECL601	Microcontroller & Applications Lab	3.00	1.00	1.00		1.00					1.00			3.00	3.00
ECL603	Antenna & Radio Wave Propagation Lab	2.50	1.50	1.25	1.00	1.00			1.00	1.00			1.00	3.00	3.00
ECLDLO 6023	**Database Management System Lab**	2.67	2.83	2.83	2.50	2.33				2.00			2.00		
ECC701	Microwave Engineering	3.00	2.75	2.50									3.00	3.00	3.00
ECC702	Mobile Communication System	3.00	2.50	2.30	2.50		2.00	1.30			1.00	2.00	2.50	3.00	3.00
ECC703	Optical Communication	3.00	2.00	1.50	1.25								1.00	3.00	2.00
ECCDLO703 3	Internet Communication Engineering	3.00	2.80	2.50									3.00	3.00	3.00
ILO7013	Management Information System	2.00	2.00	1.00	1.25	0.00	1.00	1.00	2.00	0.00	1.00	0.00	2.00	2.00	1.00
ILO7017	Disaster Management and Mitigation Measures	0.88					2.51	2.51	0.82	0.82	1.67	0.88	0.84	0.00	0.00
ECL701	Microwave Engineering Lab	2.25	2.00	1.75	1.75	2.00	0.00	0.00	0.00	2.25	2.25	0.00	0.00	2.25	2.25
ECL702	Mobile Communication System Lab	3.00	3.00	3.00	3.00	3.00	2.00	2.00	1.00	1.00	2.00	2.00	2.00	3.00	3.00
ECL703	Optical Communication Lab	3.00	2.00	1.00	1.00	2.00			1.00	2.00	2.00		1.00	3.00	2.00
ECLDLO 7033	Internet Communication Engineering Lab	3.00	2.70	2.30	2.30	2.70				3.00	3.00		3.00	3.00	3.00
ECL704	Project Stage I	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
ECC802	Wireless Networks	3.00	3.00	2.50	2.50		1.80	1.00	1.00				3.00	2.80	2.80
ECLDLO 8043	Satellite Communication	2.75	2.00	2.00	1.50								1.00	3.00	2.25
ILO8021	Project Management	2.00	2.00	1.20	2.00	1.20	1.00	1.00	1.00		2.00	3.00	3.00	3.00	1.00
ILO8024	Human Resource Management	3.00	3.00	2.50	2.50		1.75	1.00	1.00				3.00	2.75	2.75
ILO8029	Environmental Management	1.00	0.00	0.00	0.00	0.00	3.00	3.00	1.00	1.00	2.00	1.00	1.00	0.00	0.00
ECL802	Wireless Networks Lab	3.00	3.00	3.00	2.30	2.70	1.70		1.30		2.00		2.00	3.00	3.00
ECCDLO804 3	Satellite Communication Lab	3.00	3.00	2.50	2.50	3.00					2.00			3.00	3.00

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ECL803	Project Stage II	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	PO Attainment	2.61	2.21	1.96	1.98	2.04	2.05	1.86	1.50	1.87	1.90	2.07	1.76	2.55	2.26

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Sr. No.	Course Name	Course Code	CO Number	Course Outcome
				Students will be able to
1	Applied Mathematics -III	ITC301	ITC301.1	apply Laplace transform to evaluate integrals.
			ITC301.2	apply inverse Laplace transform to solve initial value problems.
			ITC301.3	identify analytic functions and find images of curve under analytic functions.
			ITC301.4	apply the set theory , relation and functions concepts.
			ITC301.5	identify different counting techniques such as permutations and combinations.
2	Logic Design	ITC302	ITC302.1	minimize the Boolean algebra and design it using logic gates.
			ITC302.2	analyze and design combinational circuit.
			ITC302.3	realize given function using combinational circuit.
			ITC302.4	design and develop sequential circuits
			ITC302.5	translate real world problems into digital logic formulations using VHDL.
3	Data Structures & Analysis	ITC303	ITC303.1	implement various linear data structures & be able to handle operations like insertion, deletion, searching and traversing on various data structures.
			ITC303.2	implement various nonlinear data structures & be able to handle operations like insertion, deletion, searching and traversing on various data structures.
			ITC303.3	to select appropriate sorting and searching technique for given problem.
			ITC303.4	to choose appropriate data structure and apply it in various problem domains.
4	Database Management System	ITC304	ITC304.1	explain the features of database management systems and relational database.

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			ITC304.2	design conceptual models of a database using ER modelling for real life applications and also construct queries in relational algebra.
			ITC304.3	use SQL to create and populate a RDBMS and to retrieve any type of information from a database by formulation of complex queries.
			ITC304.4	apply the concepts of normalization to design an optimal database.
			ITC304.5	explain the indexes for a database by using techniques like B or B+ trees.
5	Principle of Communications	ITC305	ITC305.1	Apply Fourier analysis to identify different types of noise occurred in analog and digital communication systems.
			ITC305.2	Discuss different Analog Modulation and Demodulation Methods
			ITC305.3	Apply Sampling Theorem to design Pulse Modulation and Demodulation Methods and to understand different multiplexing techniques
			ITC305.4	Discuss Digital Modulation and Demodulation methods and also describe the effect of Electromagnetic Radiation and propagation of waves.
6	Digital Design Lab	ITL301	ITL301.1	minimize the Boolean algebra and design it using logic gates.
			ITL301.2	analyze and design combinational circuit.
			ITL301.3	realize given function using combinational circuit.
			ITL301.4	design and develop sequential circuits
			ITL301.5	translate real world problems into digital logic formulations using VHDL.
7	Data Structures Lab	ITL302	ITL302.1	to implement various linear data structures & be able to handle operations like insertion, deletion, searching and traversing on various linear data structures.
			ITL302.2	to implement various nonlinear data structures & be able to handle operations like insertion, deletion, searching and traversing on various nonlinear data structures.
			ITL302.3	to select appropriate sorting and searching technique for given problem.
			ITL302.4	to choose appropriate data structure and apply it in various problem domains.
8	SQL Lab	ITL303	ITL303.1	construct problem definition statements for real life applications and implement a database for the same.

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			ITL303.2	design conceptual models of a database using ER modeling for real life applications and also construct queries in relational algebra.
			ITL303.3	create and populate a RDBMS and retrieve any type of information from a database, using SQL.
			ITL303.4	analyze and apply concepts of normalization to design an optimal database.
			ITL303.5	discuss indexes for a database by using techniques like B or B+trees.
9	Java Programming Lab	ITL304	ITL304.1	implement object oriented programming concept using basic syntaxes of control Structures, strings and functionsfor developing skills of logic building activity.
			ITL304.2	identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem.
			ITL304.3	demonstrate how to achieve reusability using inheritance interfaces and packages.
			ITL304.4	demonstrate programs on exceptions handling and concept of multithreading for robust faster and efficient application development.
			ITL304.5	identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events
			ITL304.6	identify, Design & develop complex Graphical user interfaces using principal Java Swing classes based on MVC architecture
10	Applied Mathematics IV	SEITC401	SEITC401.1	find mean and variance of a probability distribution function
			SEITC401.2	use sampling theory to different problems and find correlation between two variables.
			SEITC401.3	apply number theory to solve problems.
			SEITC401.4	identify different groups
			SEITC401.5	identify Eulerian path, Hamiltonion path, planar graph, lattice.
11	Computer Networks	SEITC402	SEITC402.1	describe the functions of each layer in OSI and TCP/IP model and explain the functions of application layer and presentation layer paradigms and Protocols.
			SEITC402.2	describe the session layer design issues and transport layer services and apply different compression algorithms to compress given data.
			SEITC402.3	classify the routing protocols and analyze how to assign the IP addresses for the given network

			SEITC402.4	describe the functions of data link layer, different protocols, types of transmission media with real time applications and use different error correction and detection
12	Computer Organization & Architecture	SEITC404	SEITC404.1	describe basic organization of computer and the architecture of 8086 microprocessor.
			SEITC404.2	implement assembly language program for given task for 8086 microprocessor.
			SEITC404.3	demonstrate control unit operations and conceptualize instruction level parallelism.
			SEITC404.4	demonstrate and perform computer arithmetic operations on integer and real numbers.
			SEITC404.5	categorize memory organization and explain the function of each element of a memory hierarchy.
			SEITC404.6	identify and compare different methods for computer I/O mechanisms.
13	A	SEITC405	SEITC404.1	learn fundamentals of Regular and Context Free Grammars and Languages
			SEITC404.2	understand the relation between Regular Language and Finite Automata and machines and to learn how to design Automata's and machines as Acceptors, Verifiers and Translators
			SEITC404.3	understand the relation between Contexts free Languages, PDA and TM and to learn how to design PDA as acceptor and TM as Calculators
			SEITC404.4	learn how to co-relate Automata's with Programs and Functions
14	Network Lab	ITL401	ITL401.1	execute and evaluate network administration commands and demonstrate their use in different network scenarios
			ITL401.2	demonstrate the installation and configuration of network simulator.
			ITL401.3	demonstrate and measure different network scenarios and their performance behavior.
			ITL401.4	analyze the contents the packet contents of different protocols
			ITL401.5	implement the socket programming for client server architecture.
			ITL401.6	design and setup an organization network using packet tracer
15	Unix Lab	ITL402	ITL402.1	identifying basic Unix general purpose and networking commands

			ITL402.2	use administrative Unix commands to change ownership or file permissions
			ITL402.3	write AWK, perl and sed,grep command
			ITL402.4	write shell script
16	Microprocessor Lab	ITL403	ITL403.1	learn assembling and disassembling of PC.
			ITL403.2	build a program on a microprocessor using arithmetic & logical instruction set of 8086
			ITL403.3	develop the assembly language programming using 8086 loop instruction
			ITL403.4	write programs based on string and procedure for 8086 microprocessor
17	Python Lab	ITL404	ITL404.1	describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python
			ITL404.2	express different Decision Making statements and Functions
			ITL404.3	interpret Object oriented programming in Python.
			ITL404.4	understand and summarize different File handling operations
			ITL404.5	explain how to design GUI Applications in Python and evaluate different database operations
			ITL404.6	design and develop Client Server network applications using Python
18	Microcontroller and Embedded Programming	ITC501	ITC501.1	Explain the embedded system concepts and architecture of embedded system
			ITC501.2	Describe the architecture of 8051 microcontroller and write embedded program for 8051 microcontroller and Design the interfacing for 8051 microcontroller.
			ITC501.3	Understand the concepts of ARM architecture.
			ITC501.4	Understand the concepts of RTOS.
19			ITC501.5	Select elements for an embedded systems tool.

	Internet Programming	ITC 502	ITC502.1	Implement interactive web pages using HTML, CSS Javascript and Design a responsive website using HTML5 and CSS3.
			ITDLO5015.3	Demonstrate Rich Internet Application.
			ITDLO5015.2	Build Dynamic web site using server side PHP Programming and Database connectivity.
			ITDLO5015.1	Describe and differentiate different Web Extensions and Web Services.
			ITDLO5015.0	Demonstrate web application using Python web Framework-Django
20	Computer Graphics & Virtual Reality	ITDLO5015	ITDLO5015.1	To list the basic concepts used in computer graphics.
			ITDLO5015.2	To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
			ITDLO5015.3	To describe the importance of viewing and projections.
			ITDLO5015.4	To define the fundamentals of animation, virtual reality and its related technologies.
			ITDLO5015.5	To understand a typical graphics pipeline
			ITDLO5015.6	To design an application with the principles of virtual reality
21	CRYPTOGRAPHY & NETWORK SECURITY	ITC504	ITC504.1	Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory.
			ITC504.2	Understand, compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication.
			ITC504.3	Apply the knowledge of cryptographic checksums and evaluate the performance ofdifferent message digest algorithms for verifying the integrity of varying message sizes.
			ITC504.4	Apply different digital signature algorithms to achieve authentication and create secure applications.
			ITC504.5	Apply network security basics, analyze different attacks on networks and evaluate theperformance of firewalls and security protocols like SSL, IPSec, and PGP.
			ITC504.6	Apply the knowledge of cryptographic utilities and authentication mechanisms todesign secure applications.
22	Internet Programming Lab	ITL 501	ITL501.1	Design a basic website using HTML5 and CSS3 to demonstrate responsive web design and implement dynamic web pages with validation using JavaScript objects by applying different event handling

				mechanism.
			ITL501.2	Use AJAX Programming Technique to develop RIA
			ITL501.3	Develop simple web application using server side PHP programming and Database Connectivity using MySQL.
			ITL501.4	Build well-formed XML Document and implement Web Service using Java.
			ITL501.5	Demonstrate simple web application using Python Django Framework.
23	SECURITY LAB	ITL502	ITL502.1	Apply the knowledge of symmetric cryptography to implement simple ciphers.
			ITL502.2	Analyze and implement public key algorithms like RSA and El Gamal.
			ITL502.3	Analyze and evaluate performance of hashing algorithms.
			ITL502.4	Explore the different network reconnaissance tools to gather information about networks.
			ITL502.5	Use tools like sniffers, port scanners and other related tools for analyzing packets in a network.
			ITL502.6	Apply and set up firewalls and intrusion detection systems using open source technologies andto explore email security.
24	IOT Mini-project Lab	ITL504	ITL504.1	Identify the requirements for the real world problems.
			ITL504.2	Conduct a survey of several available literatures in the preferred field of study.
			ITL504.3	Study software/ hardware skills and build the project successfully by hardware requirements, coding, emulating and testing.
			ITL504.4	To report and present the findings of the study conducted in the preferred domain
			ITL504.5	Demonstrate an ability to work in teams and manage the conduct of the research study.
25	Software Engineering with project Management	ITC 601	ITC601.1	Define various software application domains and remember different process model used in software development.
			ITC601.2	Explain needs for software specifications and cost estimation , also they can classify different types of software requirements and their gathering techniques.

			ITC601.3	Convert the requirements model into the design model and demonstrate use of software and user-interface design principles.
			ITC601.4	Distinguish among SCM and SQA and can classify different testing strategies and tactics and compare them.
			ITC601.5	Justify role of SDLC in Software Project Development and they can evaluate importance of Software Engineering in PLC.
			ITC601.6	Generate project schedule and can construct, design and develop network diagram for different type of Projects. They can also organize different activities of project as per Risk impact factor.
26	Data Mining & Business Intelligence	ITC602	ITC602.1	Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents
			ITC602.2	Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game based techniques to solve them
			ITC602.3	Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing
			ITC602.4	Attain the capability to represent various real life problem domains using logic based techniques and use this to perform inference or planning
			ITC602.5	Formulate and solve problems with uncertain information using Bayesian approaches
			ITC602.6	Apply concept Natural Language processing to problems leading to understanding of cognitive computing.
27	Business Intelligence Lab	ITL602	ITL602.1	Identify sources of Data for mining and perform data exploration.
			ITL602.2	Organize and prepare the data needed for data mining algorithms in terms of attributes and class inputs, training, validating, and testing files.
			ITL602.3	Implement the appropriate data mining methods like classification, clustering or association mining on large data sets using open source tools like WEKA.
			ITL602.4	Implement various data mining algorithms from scratch using languages like Python/ Java etc.
			ITL602.5	Evaluate and compare performance of some available BI packages.
			ITL602.6	Apply BI to solve practical problems : Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret and visualize the results and provide decision support
28	Cloud Computing & Services	ITC 603	ITC603.1	define the need for Cloud Computing and explain its fundamental concepts

			ITC603.2	describe importance of virtualization along with theirtechnologies
			ITC603.3	use and examine different cloud computing services
			ITC603.4	analyze the components of open stack & Google Cloud platform and explain Mobile Cloud Computing
			ITC603.5	describe the key components of Amazon web Service
			ITC603.6	describe the backup strategies for cloud data based on features
29	Cloud Service Design Lab	ITL 603	ITL603.1	define and implement virtualization using different types of Hypervisors
			ITL603.2	describe the steps to perform on demand application delivery using Ulteo.
			ITL603.3	examine the installation and configuration of Open stack cloud
			ITL603.4	analyze and understand the functioning of different components involved in Amazon web services cloud platform.
			ITL603.5	develop and explain the functioning of Platform as a Service
			ITL603.6	design & summarize Storage as a Service using own Cloud
30	Wireless Network	ITC 604	ITC604.1	explain the basic concepts of wireless network and wireless generations.
			ITC604.2	demonstrate the different wireless technologies such as CDMA, GSM, GPRS etc.
			ITC604.3	appraise the importance of Ad-Hoc networks such as MANET and VANET and Wireless Sensor networks. (BTL-4)
			ITC604.4	describe and judge the emerging wireless technologies standards such as WLL, WLAN, WPAN, WMAN (BTL-4)
			ITC604.5	explain the design considerations for deploying the wireless network infrastructure.
			ITC604.6	differentiate and support the security measures, standards, services and layer wise security considerations.
31	Dept Level Elective: Digital Forensics	TEITDLO6023	TEITDLO6023.1	Define the concept of ethical hacking and its associated applications in Information Communication Technology (ICT) world with need of digital forensic and role of digital evidences.

			TEITDLO6023.2	Explain the methodology of incident response and various security issues in ICT world, and identify digital forensic tools for data collection.
			TEITDLO6023.3	Recognize the importance of digital forensic duplication and various tools for analysis to achieve adequate perspectives of digital forensic investigation in various applications /devices like Windows/Unix system.
			TEITDLO6023.4	Apply the knowledge of IDS to secure network and performing router and network analysis and list the method to generate legal evidence and supporting investigation reports and will also be able to use various digital forensic tools.
32	Software Design Lab	ITL 601	ITL601.1	Apply a Modeling with UML and design Use case Diagram
			ITL601.2	Create Structural Modeling.
			ITL601.3	Create Behavioral Modeling
			ITL601.4	Create Component Modeling.
			ITL601.5	Evaluate estimation about schedule and cost for project development.
			ITL601.6	Analyse project development tool.
33	Sensor Network Lab	ITL604	ITL604.1	Identify the requirements for the real world problems.
			ITL604.2	Conduct a review of several available literatures in the preferred field of study.
			ITL604.3	Examine and revise software/ hardware skills.
			ITL604.4	Develop and demonstrate the project successfully by hardware/sensor requirements, coding, emulating and testing.
			ITL604.5	To report and present the findings of the study conducted in the preferred domain.
			ITL604.6	Demonstrate an ability to work in teams and manage the conduct of the research study.
34	Mini Project	ITM605	ITM605.1	Discover potential research areas in the field of IT
			ITM605.2	Conduct a survey of several available literature in the preferred field of study.

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			ITM605.3	Compare and contrast the several existing solutions for research challenge
			ITM605.4	Demonstrate an ability to work in teams and manage the conduct of the research study.
			ITM605.5	Formulate and propose a plan for creating a solution for the research plan identified
			ITM605.6	To report and present the findings of the study conducted in the preferred domain
35	Internet of Everything	BEITC802	BEITC802.1	Apply the concepts of IoT to identify the different technology.
			BEITC802.2	Apply IoT to design and develop smart city and various applications.
			BEITC802.3	Analyze and evaluate protocols used in IoT.
			BEITC802.4	Analyze and evaluate the data received through sensors in IoT.
36	Project -I	ITM705	ITM705.1	Discover potential research areas in the field of IT
			ITM705.2	Conduct a survey of several available literature in the preferred field of study
			ITM705.3	Compare and contrast the several existing solutions for research challenge
			ITM705.4	Demonstrate an ability to work in teams and manage the conduct of the research study.
			ITM705.5	Formulate and propose a plan for creating a solution for the research plan identified
			ITM705.6	To report and present the findings of the study conducted in the preferred domain
37	Management Information System	ILO 7013	ILO7013.1	Identify the impact of Information System on an organisation to transform into business.
			ILO7013.2	Describe IT infrastructure, its components and its current trends.
			ILO7013.3	Understand the principal tools and technologies for accessing information from databases to improve business performance and decision making.
			ILO7013.4	Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses.

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38	Intelligence Systems Lab	ITL703	ITL703.1	1. Design the building blocks of an Intelligent Agent using PEAS representation
			ITL703.2	2. Can you analyze and formalize the problem and select appropriate search method?
			ITL703.3	3. Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing
			ITL703.4	4. Attain the capability to represent various real life problem domains using logic based techniques and use this to perform inference or planning
			ITL703.5	5. Formulate and solve problems with uncertain information using Bayesian approaches
			ITL703.6	6.Apply concept Natural Language processing and cognitive computing for creation of domain specific ChatBots
39	Artificial Intelligence	ITC703	ITC703.1	Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents
			ITC703.2	Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game based techniques to solve them
			ITC703.3	Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing
			ITC703.4	Attain the capability to represent various real life problem domains using logic based techniques and use this to perform inference or planning
			ITC703.5	Formulate and solve problems with uncertain information using Bayesian approaches
			ITC703.6	Apply concept Natural Language processing to problems leading to understanding of cognitive computing.
40	Soft Computing	ITDLO7035	ITDLO7035.1	Analyze and apply fuzzy logic concepts, fuzzy principles and relations.
			ITDLO7035.2	Design inference systems.
			ITDLO7035.3	Understand the difference between learning, programming and will be able to explore practical applications of Neural Networks(NN).
			ITDLO7035.4	Understand the importance of genetic algorithm and its use in computer engineering fields and other domains.
41	User Interaction Design	ITDLO8041	ITDLO8041.1	identify and criticize bad features of interface designs.
			ITDLO8041.2	predict good features of interface designs.

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			ITDLO8041.3	illustrate and analyze user needs and formulate user design specifications.
			ITDLO8041.4	interpret and evaluate the data collected during the process.
			ITDLO8041.5	evaluate designs based on theoretical frameworks and methodological approaches.
			ITDLO8041.6	show better techniques to improve the user interaction design interfaces.
42	Project Management	ILO 8021	ILO8021.1	Apply selection criteria and select an appropriate project from different options.
			ILO8021.2	Write work break down structure for a project and develop a schedule based on it.
			ILO8021.3	Identify opportunities and threats to the project and decide an approach to deal with them strategically.
			ILO8021.4	Use Earned value technique and determine & predict status of the project.
			ILO8021.5	Capture lessons learned during project phases and document them for future reference
43	R Programming Lab	ITL804	ITL804.1	install and use R for simple programming tasks.
			ITL804.2	extend the functionality of R by using add-on packages.
			ITL804.3	extract data from files and other sources and perform various data manipulation tasks on them.
			ITL804.4	code statistical functions in R.
			ITL804.5	use R Graphics and Tables to visualize results of various statistical operations on data.
			ITL804.6	apply the knowledge of R gained to data analytics for real life applications.
44	Project -II	ITM805	ITM805.1	Discover potential research areas in the field of IT
			ITM805.2	Conduct a survey of several available literature in the preferred field of study
			ITM805.3	Compare and contrast the several existing solutions for research challenge
			ITM805.4	Demonstrate an ability to work in teams and manage the conduct of the research study.
			ITM805.5	Formulate and propose a plan for creating a solution for the research plan identified

			ITM805.6	To report and present the findings of the study conducted in the preferred domain
45	Internet of Everything Lab	BEITL802	BEITL802.1	Identify the requirements for the real world problems.
			BEITL802.2	Conduct a survey of several available literatures in the preferred field of study.
			BEITL802.3	Study software/ hardware skills and build the project successfully by hardware requirements, coding, emulating and testing.
			BEITL802.4	To report and present the findings of the study conducted in the preferred domain.
			BEITL802.5	Demonstrate an ability to work in teams and manage the conduct of the research study.

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INFORMATION TECHNOLOGYPO Attainment AY 2019-20														
		Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
SUBJECT NAME	**SUBJECT CODE**													
Applied Mathematics -III	**ITC-301**	**2**	**3.00**	**1.00**	**1**					**1.00**		**1.00**		**1.00**
Logic Design	ITC-302	3	2.64	2.35	2.35	2.05				0.88		0.88		0.88
Data Structures Algorithm	ITC-303	2	2.505	2.505	1.67	1.67				0.835		0.835		1.67
Database Mamagemen t System	ITC-304	2.89	**2.89**	**2.53**	**2.528**	**2.41**	**1.00**			**0.96**		**0.96**		**1.00**
Principles of Communicati on	ITC-305	3	**2.50**	**1.25**		**1.00**	**2.00**			**1.00**	**2.25**	**1.00**		**1.50**
Digital Design Lab	ITL-301	3	3.00	3.00	2.8	2.60	3.00			1.00		1.00		1.00
Data Structure Lab	ITL-302	1	1.35	1.35	1.35	1.35				0.45		0.45		0.9
SQL-LAB	ITL-303	2.28	**1.98**	**2.00**	**2.1**	**2.10**	**2.30**			**0.80**	**0.80**	**1.52**		**0.76**
JAVA Programming Lab	ITL-304	2	0.93	0.83	1.4	1.40	0.47					0.93		
Applied Mathematics -IV	ITC-401	1	**3.00**	**1.00**	**1.00**					**1.00**		**1.00**		**1.00**
Computer Network	ITC-402	3	1.28	1.83	1.47	2.02				0.73		0.73		
Operating System	ITC-403	2	2.19	2.19	1.46	1.46				0.73		0.73		1.46
Computer Organization and Architecture	ITC-404	3	2.00	1.67	1	1.00				1.00		1.00		1.00

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Network Lab	ITL-401	3	1.20	1.20	1.2	1.56	1.50			0.60		0.60		
Unix Lab	ITL-402	3	1.35	1.38	1.35	1.35	0.9			0.45		0.45		0.9
Microprocessor Lab	ITL-403	3	2.00	2.00	1	1.00	1.75			1.00	3.00	2.25		1.00
Python Lab	ITL-404	3	3.00	2.00	1	1.00	3.00	1.00	1.00	1.00	2.00	3.00	1.00	1.00
Microcontroller and Embedded Programming	ITC501	2	0.94	0.94	0.94	1.15	0.92			0.42		0.42		1.01
Internet Programming	ITC 502	2	**2.00**	**2.00**	**2.5**	**1.00**				**1.00**		**1.40**		**1.00**
Cryptography & Network Security	ITC504	3	**3.00**	**3.00**	**3**	**3.00**		**3.00**		**3.00**		**3.00**		**3.00**
E-Commerce & E-Business	ITDLO5013	3	**3.00**	**3.00**	**3**	**3.00**		**3.00**		**3.00**		**3.00**		**3.00**
Internet Programming Lab	ITL 501	2	**1.78**	**1.78**	**2.076**	**1.15**	**0.87**	**1.64**	**0.82**	**0.89**	**2.46**	**1.38**	**0.82**	**0.87**
Security Lab	ITL502	2	**1.63**	**1.69**	**1.690909**	**1.70**	**1.65**	**1.66**	**1.66**	**1.66**		**1.64**		**1.66**
IOT (Mini Project) Lab	ITL504	3	2.25	2.25	2	2.00	2.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Business Communication and Ethics	ITL505	3	-	-	-	-	-	1.27		1.27	2.00	2.40		2.20
Software Engineering with Project Management	ITC601	3	**2.67**	**2.67**	**2.333333**	**2.00**		**1.00**	**1.00**	**1.00**		**1.17**	**1.67**	**1.50**
Data Mining and Business Intelligence	ITC602	3	**3.00**	**3.00**	**3**	**3.00**		**3.00**		**3.00**		**3.00**		**3.00**
Cloud Computing & Services	ITC603	3	**2.67**	**2.17**	**2.17**	**2.00**				**1.00**		**1.00**		**1.00**

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Wireless Networks	ITC604	3	**3.00**	**3.00**	**3**	**3.00**		**3.00**		**3.00**		**3.00**		**3.00**
Software Design Lab	ITL601	3	**2.83**	**2.83**	**3**	**2.00**	**2.00**			**1.00**	**3.00**	**2.83**	**2.00**	**1.00**
Business Intelligence Lab	ITL602	3	**1.67**	**2.33**	**2.6**	**2.33**	**3.00**			**1.00**	**2.17**	**2.00**		**2.00**
Cloud Service Design Lab	ITL603	3	**2.50**	**2.33**	**2.67**	**2.67**	**2.67**			**1.00**		**2.00**		**1.00**
Sensor Network Lab	ITL604	3	**1.63**	**1.69**	**1.690909**	**1.70**	**1.65**	**1.66**	**1.66**	**1.66**		**1.64**		**1.66**
Dept Level Elective: Digital Forensics	TEITDLO6023	3	2.00	2.50		2.75	2.00			2.00		1.00		
Mini-Project	ITM605	2	**3.00**	**3.00**	**3**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**
Infrastructure Security	BEITC702	3	1.75	2.25	1	2.75	1.00			2.00		1.00		
Artificial Intelligence	BEITC703	3	**3.00**	**2.00**	**2**	**2.00**				**1.00**		**1.00**		**1.00**
Soft Computing	ITDLO7035	3	3.00	3.00	3	3.00				1.00		1.00		3.00
Mangement Information System	ILO 7013		**2.00**	**2.00**	**1**	**1.25**		**1.00**	**1.00**	**2.00**		**1.00**		**2.00**
Advanced Security Lab	BEITL702	3	2.00	2.20	2	3.00	2.80			2.00		1.00		
Intelligence System Lab	BEITL703	3	**2.00**	**2.17**	**3**	**2.50**	**3.00**	**0.17**		**1.00**	**0.50**	**2.17**		**1.00**
Project-I	ITM705	3	**3.00**	**3.00**	**3**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**
Big Data Analytics	ITC801	3	2.00	1.50	1.25	1.50				1.00		1.00	1.00	1.00
Internet of Everything	BEITC802		**2.75**	**2.25**	**2**	**2.25**				**1.00**		**1.00**		**1.00**

User Interaction Design	ITDLO8041	3	2.17	1.67	2	1.75				1.00		1.00		1.00
Human Resource Management	ILO8024	3	1.75	1.75	2	2.50		1.75	0.50	0.50				1.00
Project Mangement	ILO 8021		**2.00**	**2.00**	**1.2**	**2.00**	**1.20**	**1.00**	**1.00**	**1.00**		**2.00**	**3.00**	**3.00**
Big Data Lab	ITL801		2.00	1.50	1.25	1.50	1.00	1.00	1.33	1.00		1.00	1.00	1.00
R Programming Lab	ITL804	3	**2.33**	**2.67**	**2.5**	**2.17**	**3.00**		**1.00**	**1.00**	**3.00**	**2.00**	**3.00**	**2.00**
Project-II	ITM805	3	**3.00**	**3.00**	**3**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**
		2.6993	2.268115653	2.1065745	1.990407	2.0338352	2.0064815	1.9552131	1.6413605	1.3641506	2.3697619	1.559047	2.1238889	1.6129708

XAVIER INSTITUTE OF ENGINEERING MUMBAI

PRINCIPAL
Xavier Institute of Engineering
Mahim, Mumbai - 400 016.