	Nutan Maharashtra VidyaPrasarak Mandal's **Nutan Maharashtra Inst. of Engg. & Tech.**	Record No.: **ACDM/R/046** Revision: **00** Date: 15.06.2016

Department Of INFORMATION TECHNOLOGY

Bachelor Of Engg 2015 Pattern - Course Outcome

Sr No.	Year /Sem	Subject Name	Subject Code	Course Outcome
01	2nd / III	DISCRETE STRUCTURES	214442	1. Use set, relation and function to formulate a problem and solve it 2. Use graph theory and trees to formulate the problems and solve them 3. Use mathematical propositions and proof techniques to check the truthfulness of a real life situation.
02	2nd / III	COMPUTER ORGANIZATION &ARCHITECTURE	214442	1. Solve problems based on computer arithmetic. 2. Explain processor structure & its functions. 3. Obtain knowledge about micro-programming of a processor. 4. Understand concepts related to memory & IO organization. 5. Acquire knowledge about instruction level parallelism & parallel organization of multiprocessors & multi core systems.
03	2nd / III	DIGITAL ELECTRONICS AND LOGIC DESIGN	214443	1. Spectacle an awareness and apply knowledge of number systems, codes, Boolean algebra and use necessary A.C, D.C Loading characteristics as well as functioning while designing with logic gates. 2. Use logic function representation for simplification with K-Maps and analyze as well as design Combinational logic circuits using SSI & MSI chips. 3. Analyze Sequential circuits like Flip-Flops (Truth Table, Excitation table), their conversion & design the applications. 4. Identify the Digital Circuits, Input/Outputs to replace by FPGA 5. Use VHDL programming technique with different modeling styles for any digital circuits.
04	2nd / III	FUNDAMENTAL OF DATA STRUCTURES	214444	1. Apply appropriate constructs of C language, coding standards for application development. 2. Use dynamic memory allocation concepts and file handling in various application developments. 3. Perform basic analysis of algorithms with respect

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				to time and space complexity 4. Select appropriate searching and/or sorting techniques in the application development 5. Select and use appropriate data structures for problem solving and programming 6. Use algorithmic foundations for solving problems and programming
05	**2nd / III**	PROBLEM SOLVING AND OBJECT ORIENTED PROGRAMMING	214445	1. Develop algorithms for solving problems by using modular programming concepts 2. Abstract data and entities from the problem domain, build object models and design software solutions using object-oriented principles and strategies 3. Discover, explore and apply tools and best practices in object-oriented programming. 4. Develop programs that appropriately utilize key object-oriented concepts
06	**2nd / III**	DIGITAL LABORATORY	214446	1. Spectacle an awareness and apply knowledge and concepts and methods of digital system design techniques as hands-on experiments with the use of necessary A.C, D.C Loading characteristics. 2. Use logic function representation for simplification with K-Maps and analyze as well as design Combinational logic circuits using SSI & MSI chips. 3. Analyze Sequential circuits like Flip-Flops (Truth Table, Excitation table) & design the applications like Asynchronous and Synchronous Counters. 4. Design Sequential Logic circuits: Sequence generators, MOD counters with registers/Counters using synchronous /asynchronous counters. 5. Understand the need of skills, techniques and learn state-of-the-art engineering tools through hands-on experimentation on the Xilinx tools for design as well as the basics of VHDL. 6. Understand and implement the design Steps, main programming technique with different modeling styles for any digital circuits with VHDL Programming.
07	**2nd / III**	PROGRAMMING LABORATORY	214447	1. Apply appropriate constructs of C language, coding standards for application development. 2. Use dynamic memory allocation concepts and file

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				handling in various application developments. 3. Perform basic analysis of algorithms with respect to time and space complexity 4. Select appropriate searching and/or sorting techniques in the application development 5. Select and use appropriate data structures for problem solving and programming 6. Use algorithmic foundations for solving problems and programming
08	**2nd / III**	OBJECT ORIENTED PROGRAMMING LABORATORY	214448	1. Develop and implement algorithms for solving simple problems using modular programming concept. 2. Abstract data and entities from the problem domain, build object models and design software solutions using object-oriented principles and strategies. 3. Discover, explore and apply tools and best practices in object-oriented programming. 4. Develop programs that appropriately utilize key object-oriented concepts 5. Create a data base using files
09	**2nd / III**	COMMUNICATIO N SKILLS	214449	1. Provides an ability to understand, analyze and interpret the essentiality of grammar and its proper usage. 2. Build the students' vocabulary by means of communication via web, direct Communication and indirect communication. 3. Improves Students' Pronunciation skills and understanding between various phonetic sounds during communication. 4. Understanding the various rules and means of written communication. 5. Effective communication with active listening, facing problems while communication and how to overcome it
10	**2nd / IV**	ENGINEERING MATHEMATICS – III	207003	1. Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits. 2. Solve problems related to Fourier transform, Z-Transform and applications to Signal and Image processing.

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				3. Apply statistical methods like correlation, regression analysis and probability theory for analysis and prediction of a given data as applied to machine intelligence. 4. Perform vector differentiation and integration to analyze the vector fields and apply to compute line, surface and volume integrals. 5. Analyze conformal mappings, transformations and perform contour integration of complex functions required in Image processing, Digital filters and Computer graphics.
11	**2nd / IV**	COMPUTER GRAPHICS	214450	1. Apply mathematics and logic to develop Computer programs for elementary graphic operations 2. Develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics 3. Develop the competency to understand the concepts related to Computer Vision and Virtual reality 4. Apply the logic to develop animation and gaming programs
12	**2nd / IV**	PROCESSOR ARCHITECTURE AND INTERFACING	214451	1. Learn architectural details of 80386 microprocessor 2. Understand memory management and multitasking of 80386 microprocessor 3. Understand architecture and memory organization of 8051microcontroller 4. Explain timers and interrupts of 8051 microcontroller and its interfacing with I/O devices
13	**2nd / IV**	DATA STRUCTURES AND FILES	214452	1. Analyze algorithms and to determine algorithm correctness and time efficiency class. 2. Understand different advanced abstract data type (ADT) and data structures and their implementations. 3. Understand different algorithm design techniques (brute -force, divide and conquer, greedy, etc.) and their implementation 4. Apply and implement learned algorithm design techniques and data structures to solve problems.
14	**2nd / IV**	FOUNDATIONS OF	214453	1. Understand data/signal transmission over communication media

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		COMMUNICATION AND COMPUTER NETWORK		2. Recognize usage of various modulation techniques in communication 3. Analyze various spread spectrum and multiplexing techniques 4. Use concepts of data communication to solve various related problems 5. Understand error correction and detection techniques. 6. Acquaint with transmission media and their standards
15	**2nd / IV**	PROCESSOR INTERFACING LABORATORY	214454	1. Learn and apply concepts related to assembly language programming 2. Write and execute assembly language program to perform array addition, code conversion, block transfer, sorting and string operations 3. Learn and apply interfacing of real world input and output devices to 8051 microcontroller
16	**2nd / IV**	DATA STRUCTURE AND FILES LABORATORY	214455	1. Apply and implement algorithm to illustrate use of linear data structures such as stack, queue 2. Apply and implement algorithms to create/represent and traverse non-linear data structures such as trees, graphs etc 3. Apply and implement algorithms to create and manipulate database using different file organizations 4. Learn and apply the concept of hashing in database creation and manipulation
17	**2nd / IV**	COMPUTER GRAPHICS LABORATORY	214456	1. Apply and implement line drawing and circle drawing algorithms to draw specific shape given in the problem 2. Apply and implement polygon filling algorithm for a given polygon 3. Apply and implement 2-D and 3-D transformation algorithms for given input shape 4. Apply and implement polygon clipping algorithm for given input polygon 5. Apply and implement fractal generation algorithm for a given input 6. Apply and implement animation concepts for generating simple animation without using any animation tool
18	**3rd / V**	THEORY OF	314441	1. To construct finite state machines to solve

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		COMPUTATION		problems in computing. 2. To write mathematical expressions for the formal languages 3. To apply well defined rules for syntax verification. 4. To construct and analyze Push Down, Post and Turing Machine for formal languages. 5. To express the understanding of the decidability and decidability problems. 6. To express the understanding of computational complexity.
19	**3rd / V**	DATABASE MANAGEMENT SYSTEMS	314442	1. To define basic functions of DBMS & RDBMS. 2. To analyze database models & entity relationship models. 3. To design and implement a database schema for a given problem-domain. 4. To populate and query a database using SQL DML/DDL commands. 5. Do Programming in PL/SQL including stored procedures, stored functions, cursors and packages. 6. To appreciate the impact of analytics and big data on the information industry and the external ecosystem for analytical and data services.
20	**3rd / V**	SOFTWARE ENGINEERING AND PROJECT MANAGEMENT	314443	1. To identify unique features of various software application domains and classify software applications. 2. To choose and apply appropriate lifecycle model of software development. 3. To describe principles of agile development, discuss the SCRUM process and distinguish agile process model from other process models. 4. To analyze software requirements by applying various modeling techniques. 5. To list and classify CASE tools and discuss recent trends and research in software engineering. 6. To understand IT project management through life cycle of the project and future trends in IT Project Management.
21	**3rd / V**	OPERATING SYSTEM	314444	1. Fundamental understanding of the role of Operating Systems. 2. To understand the concept of a process and

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				thread. 3. To apply the cons of process/thread scheduling. 4. To apply the concept of process synchronization, mutual exclusion and the deadlock. 5. To realize the concept of I/O management and File system. 6. To understand the various memory management techniques.
22	3rd / V	HUMAN-COMPUTER INTERACTION	314445	1. To explain importance of HCI study and principles of user-centred design (UCD) approach. 2. To develop understanding of human factors in HCI design. 3. To develop understanding of models, paradigms and context of interactions. 4. To design effective user-interfaces following a structured and organized UCD process. 5. To evaluate usability of a user-interface design. 6. To apply cognitive models for predicting human-computer-interactions.
23	3rd / V	SOFTWARE LABORATORY - I	314446	1. To install and configure database systems. 2. To analyze database models & entity relationship models. 3. To design and implement a database schema for a given problem-domain 4. To understand the relational and document type database systems. 5. To populate and query a database using SQL DML/DDL commands. 6. To populate and query a database using MongoDB commands
24	3rd / VI	SOFTWARE LABORATORY – II	314447	1. To understand the basics of Linux commands and program the shell of Linux. 2. To develop various system programs for the functioning of operating system. 3. To implement basic building blocks like processes, threads under the Linux. 4. To develop various system programs for the functioning of OS concepts in user space like concurrency control and file handling in Linux. 5. To design and implement Linux Kernel Source Code.

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				6. To develop the system program for the functioning of OS concepts in kernel space like embedding the system call in any Linux kernel.
25	3rd / VI	SOFTWARE LABORATORY – III	314448	1. To identify the needs of users through requirement gathering. 2. To apply the concepts of Software Engineering process models for project development. 3. To apply the concepts of HCI for user-friendly project development. 4. To deploy website on live webserver and access through URL. 5. To understand, explore and apply various web technologies. 6. To develop team building for efficient project development.
26	4th / VI	Green Construction & Design	AC3- I	1. To understand the importance of environment friendly society. 2. To apply primary measures to reduce carbon emissions from their surroundings. 3. To learn role of IT solutions in design of green buildings. 4. To understand the use of software systems to complete statutory compliancesinvolved in the design of a new home or office building through green construction
27	4th / VI	Leadership and Personality Development	Audit Course 3 - II	1. To exhibit responsible decision-making and personal accountability 2. To demonstrate an understanding of group dynamics and effective teamwork 3. To develop a range of leadership skills and abilities such as effectively leading change, resolving conflict, and motivating others. 4. To develop overall personality
28	4th / VI	Professional Ethics and Etiquettes	Audit Course 3 – III	1. To summarize the principles of proper courtesy as they are practiced in the workplace. 2. To describe ways to apply proper courtesy in different professional situations. 3. To practice appropriate etiquettes in the working environment and day to day life. 4. To learn and build proper practices for global corporate world.

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29	**4th / VI**	Digital & Social Media Marketing	Audit Course 3 – IV	1. Develop a far deeper understanding of the changing digital landscape. 2. Identify some of the latest digital marketing trends and skill sets needed for today's marketer. 3. Successful planning, prediction, and management of digital marketing campaigns. 4. Implement smart management of different digital assets for marketing needs. Assess digital marketing as a long term career opportunity. (round-off) errors.
30	**4th / VI**	COMPUTER NETWORK TECHNOLOGY	314450	1. To know Responsibilities, services offered and protocol used at each layer of network. 2. To understand different addressing techniques used in network. 3. To know the difference between different types of network. 4. To know the different wireless technologies and IEEE standards. 5. To use and apply the standards and protocols learned, for application development. 6. To understand and explore recent trends in network domain. Minimize the process time
31	**4th / VI**	SYSTEMS PROGRAMMING	314451	1. To learn independently modern software development tools and creates novel solutions for language processing applications. 2. To design and implement assemblers and macro processors. 3. To use tool LEX for generation of Lexical Analyzer. 4. To use YACC tool for generation of syntax analyzer. 5. To generate output for all the phases of compiler. 6. To apply code optimization in the compilation process.

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32	4th / VI	DESIGN AND ANALYSIS OF ALGORITHMS	314452	1. To calculate computational complexity using asymptotic notations for various algorithms. 2. To apply Divide & Conquer as well as Greedy approach to design algorithms. 3. To practice principle of optimality. 4. To illustrate different problems using Backtracking. 5. To compare different methods of Branch and Bound strategy. 6. To explore the concept of P, NP, NP-complete, NP-Hard and parallel algorithms
33	4th / VI	CLOUD COMPUTING	314453	1. To understand the need of Cloud based solutions. 2. To understand Security Mechanisms and issues in various Cloud Applications 3. To explore effective techniques to program Cloud Systems. 4. To understand current challenges and trade-offs in Cloud Computing. 5. To find challenges in cloud computing and delve into it to effective solutions. 6. To understand emerging trends in cloud computing.
34	4th / VI	DATA SCIENCE AND BIG DATA ANALYTICS	314454	1. To understand Big Data primitives. 2. To learn and apply different mathematical models for Big Data. 3. To demonstrate their Big Data learning skills by developing industry or research applications. 4. To analyze each learning model come from a different algorithmic approach and it will perform differently under different datasets. 5. To understand needs, challenges and techniques for big data visualization. 6. To learn different programming platforms for big data analytics
35	4th / VI	SOFTWARE LABORATORY – IV	314455	1. To implement small size network and its use of various networking commands. 2. To understand and use various networking and simulations tools. 3. To configure various client/server environments to use application layer protocols 4. To understand the protocol design at various layers.

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Nutan Maharashtra Inst. of Engg. & Tech. PUNE 410507

				5. To explore use of protocols in various wired and wireless applications. 6. To develop applications on emerging trends.
36	**4th / VI**	SOFTWARE LABORATORY - V	314456	1. To design and implement two pass assembler for hypothetical machine instructions. 2. To design and implement different phases of compiler (Lexical Analyzer, Parser, Intermediate code generation) 3. To use the compile generation tools such as "Lex" and "YACC". 4. To apply algorithmic strategies for solving various problems. 5. To compare various algorithmic strategies. 6. To analyze the solution using recurrence relation.
37	**4th / VI**	SOFTWARE LABORATORY - VI	314457	1. To apply Big data primitives and fundamentals for application development. 2. To explore different Big data processing techniques with use cases. 3. To apply the Analytical concept of Big data using R/Python. 4. To visualize the Big Data using Tableau. 5. To design algorithms and techniques for Big data analytics. 6. To design Big data analytic application for emerging trends.
38	**4th / VI**	PROJECT BASED SEMINAR	314458	1. To Gather, organize, summarize and interpret technical literature with the purpose of formulating a project proposal. 2. To write a technical report summarizing state-of-the-art on an identified topic. 3. Present the study using graphics and multimedia presentations. 4. Define intended future work based on the technical review. 5. To explore and enhance the use of various presentation tools and techniques. 6. To understand scientific approach for literature survey and paper writing.
39	**4th / VI**	Intellectual Property Rights	Audit Course 4 - I	1. To understand Intellectual Property Rights (IPR). 2. To explore applications of Trademark, Industrial Designs, Copyright and Trade Secret.

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Nutan Maharashtra Inst. of Engg. & Tech. PUNE 410507

		and Patenting		3. To understand function of USPTO, EPO. 4. To know the process of filing patent with IPO. 5. To understand the process of copyright and licensing.
40	**4th / VI**	Social Awareness and Governance Program	Audit Course 4 - II	1. Understand social issues and responsibilities as member of society. 2. Apply social values and ethics in decision making at social or organizational level 3. Promote obstacles in national integration and role of youth for National Integration 4. Demonstrate basic features of Indian Constitution
41	**4th / VI**	Sustainable Energy System	Audit Course 4 – III	1. To demonstrate an overview of the main sources of renewable energy. 2. To understand benefits of renewable and sustainable energy systems.
42	**4th / VI**	Health & Fitness Management	Audit Course 4 – IV	1. Identify the health- and skill-related fitness components. 2. Understand the benefits of physical fitness, and the underlying principles, physiology, and practices for fitness development. 3. Apply of fitness management skills and strategies for the development of physical activity habits and personal fitness by the students. 4. Aware about healthy diet for physical and mental fitness of an individual. 5. Understand importance of mental fitness along with physical fitness by practicing yoga, meditation and relaxation techniques
43	**5th / VII**	Information and Cyber Security	414453	1. Be able to use basic cryptographic techniques in software and system design. 2. Apply methods for authentication, access control, intrusion detection and prevention. 3. Able to apply the scientific method to digital forensics and perform forensic investigations. 4. To develop computer forensics awareness. 5. Ability to use computer forensics tools
44	**5th / VII**	Machine Learning and Applications	414454	1. model the learning primitives. 2. build the learning model. 3. tackle real world problems in the domain of Data Mining and Big Data Analytics, Information Retrieval,

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Nutan Maharashtra Inst. of Engg. & Tech. PUNE 410507

				Computer vision, Linguistics and Bioinformatics.
45	**5th / VII**	Software Design and Modeling	414455	1. Understand object oriented methodologies, basics of Unified Modeling Language (UML). 2. Understand analysis process, use case modeling, domain/class modeling 3. Understand interaction and behavior modeling. 4. Understand design process and business, access and view layer class design 5. Get started on study of GRASP principles and GoF design patterns. 6. Get started on study of arc
46	**5th / VII**	Elective-I Wireless Communications	414456A	1. Understand the basics of propagation of radio signals 2. Understand the basic concepts of basic Cellular System and the design requirements 3. Have an understanding of the basic principles behind radio resource management techniques such as power control, channel allocation and handoffs. 4. Gain insights into various mobile radio propagation models and how the diversity can be exploited to improve performance 5. Gain knowledge and awareness of the technologies for how to effectively share spectrum through multiple access techniques i.e. TDMA, CDMA, FDMA etc. 6. Have in-depth understanding of the design consideration and architecture for different Wireless Systems like GSM, CDMA, GPRS etc 7. Understanding of the emerging trends in Wireless communication like WiFi, WiMAX, Software Defined Radio (SDR) and related issues and challenges.
47	**5th / VII**	Elective-I Natural Language Processing	414456B	1. Understand automatic processing of human languages using computers. 2. Understand various applications of natural language processing
48	**5th / VII**	Elective-I Usability Engineering	414456C	1. justify the theory and practice of usability evaluation approaches, methods and techniques. 2. compare and evaluate strengths and weaknesses of various approaches, methods and techniques for evaluating usability. 3. design and implement a usability test plan, based on modelling or requirements specification.

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				4. choose appropriate approaches, methods and techniques to evaluate the usability of a specified interactive system..
49	**5th / VII**	Elective-I Multicore and Concurrent Systems	414456D	1. Know types of parallel machine and to know multicore and concurrent systems in detail. 2. Know the ways to measure the performance of multicore systems. 3. Understand need of multicore and concurrent system programming. 4. Know the different approaches for multicore and concurrent programming. 5. Use and apply the approaches learned, for application development. 6. Understand and explore recent trends in multicore and concurrent system programming.
50	**5th / VII**	Business Analytics and Intelligence	414456E	1. Comprehend the Information Systems and development approaches of Intelligent Systems 2. Evaluate and rethink business processes using information systems 3. Propose the Framework for business intelligence 4. Get acquainted with the Theories, techniques, and considerations for capturing organizational intelligence 5. Align business intelligence with business strategy 6. Apply the techniques for implementing business intelligence systems
51	**5th / VII**	Software Defined Networks	414457A	1. Acquire fundamental knowledge of SDN exploring the need, characteristics, and architecture of SDN. 2. Recognize OpenFlow protocols and its forwarding, pipeline model. 3. Understand different methodologies for sustainable SDN. 4. Comprehend IT Infrastructure for SDN. 5. 5. Acquiring knowledge of OpenFlow protocols, visualization.

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52	**5th / VII**	Soft Computing	414457B	1. Tackle problems of interdisciplinary nature. 2. Find an alternate solution , which may offer more adaptability, resilience and optimization 3. Gain knowledge of soft computing domain which opens up a whole new career option 4. Tackle real world research problems
53	**5th / VII**	Software Testing and Quality Assurance	414457C	1. Test the software by applying testing techniques to deliver a product free from bugs. 2. Investigate the scenario and to select the proper testing technique. 3. Explore the test automation concepts and tools and estimation of cost, schedule based on standard metrics. 4. Understand how to detect, classify, prevent and remove defects. 5. Choose appropriate quality assurance models and develop quality. 6. Ability to conduct formal inspections, record and evaluate results of inspections
54	**5th / VII**	Compiler Construction	414457D	1. Understand the structure of compilers 2. Understand the basic and advanced techniques used in compiler construction 3. Understand the basic data structures used in compiler construction such as abstract syntax 4. trees, symbol tables, three-address code, and stack machines 5. Cognitive skills (thinking and analysis)- Design and implement a compiler using a software engineering approach 6. Communication skills (personal and academic). 7. Practical and subject specific skills (Transferable Skills) - Use generators (e.g. Lex and Yacc)
55	**5th / VII**	Gamification	414457E	1. Write programs to solve problems using gamification and open source tools. 2. To apply gamifications for Mobile and Web Applications 3. Solve problems for multi-core or distributed, concurrent/Parallel environments

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56	**5th / VII**	Computer Laboratory VII	414458	1. The students will be able to implement and port controlled and secured access to software systems and networks. 2. The students will be able to build learning software in various domains.
57	**5th / VII**	Computer Laboratory VIII	414459	1. Draw, discuss different UML 2.0 diagrams, their concepts, notation, advanced notation, forward and reverse engineering aspects. 2. Identify different software artifacts used to develop analysis and design model from requirements. 3. Develop use case model 4. Develop, implement analysis model and design model 5. Develop, implement Interaction and behaviour Model 6. Implement an appropriate design pattern to solve a design problem.
60	**5th / VII**	Project Phase-I	414460	1. To show preparedness to study independently in chosen domain of Information Technology and programming languages and apply their acquired knowledge to variety of real time problem scenarios. 2. To function effectively as a team to accomplish a desired goal. 3. An understanding of professional, ethical, legal, security and social issues and responsibilities related to Information Technology Project.
61	**5th / VII**	Audit Course-V Emotional Intelligence	414461A	1. Expand your knowledge of emotional patterns in yourself and others. 2. Discover how you can manage your emotions, and positively influence yourself and others. 3. Build more effective relationships with people at work and at home. 4. Positively influence and motivate colleagues, team members, and managers. 5. Increase your leadership effectiveness by creating an atmosphere that engages others. 6. Apply EI behaviours and supports high performance.

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62	5th / VII	Audit Course-V Green Computing	414461B	1. Understand the concept of green IT and relate it to sustainable development. 2. Apply the green computing practices to save energy. 3. Discuss how the choice of hardware and software can facilitate a more sustainable operation, 4. Use methods and tools to measure energy consumption
63	5th / VII	Audit Course-V Critical Thinking	414461C	1. If students whole-heartedly participate in the course, they can expect to be smarter, stronger and more confident thinkers. 2. They can embark on a life-long journey of "self-directed learning"
64	5th / VII	Audit Course-V Statistical Learning Model using R	414461D	1. Students will be familiar with concepts related to "data science", "analytics", "machine learning", etc. These are important topics, and will enable students to embark on highly rewarding careers. 2. Students will capable of learning "big data" concepts on their own
65	6th / VIII	Distributed Computing System	414462	1. Understand the principles and desired properties of distributed systems based on different application areas. 2. Understand and apply the basic theoretical concepts and algorithms of distributed systems in problem solving. 3. Recognize the inherent difficulties that arise due to distributed-ness of computing resources. 4. 4. Identify the challenges in developing distributed applications
66	6th / VIII	Ubiquitous Computing	414463	1. Demonstrate the knowledge of design of Ubicomp and its applications. 2. Explain smart devices and services used Ubicomp. 3. Describe the significance of actuators and controllers in real time application design. 4. Use the concept of HCI to understand the design of automation applications. 5. Classify Ubicomp privacy and explain the challenges associated with Ubicomp privacy. 6. Get the knowledge of ubiquitous and service oriented networks along with Ubicomp

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				management.
67	6th / VIII	Internet of Things (IoT)	414464A	1. Explain what is internet of things. 2. Explain architecture and design of IoT 3. Describe the objects connected in IoT 4. Understand the underlying Technologies. 5. Understand the platforms in IoT 6. Understand cloud interface to IoT
68	6th / VIII	Internet of Things Laboratory	414464A	1. To understand IoT platforms such as Raspberry-Pi/Beagle board/Arduino. 2. To understand operating systems for platforms such as Raspberry-Pi/Beagle board/Arduino. 3. To communicate with objects using IoT platforms such as Raspberry-Pi/Beagle board/Arduino. 4. To interface cloud environment for IoT application. 5. To implement IoT related protocols such as MQTT / CoAP etc. 6. To implement the web interface for IoT
68	6th / VIII	Information Storage and Retrieval	414464B	1. Student should be able to understand the concept of Information retrieval. 2. Student should be able to deal with storage and retrieval process of text and multimedia data. 3. Student should be able to evaluate performance of any information retrieval system. 4. Students should be able to design user interfaces 5. Student should be able to understand importance of recommender system. 6. Student should be able to understand concept of multimedia and distributed information retrieval.

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69	**6th / VIII**	Information Storage and Retrieval Laboratory	414464B	1. Student should be able to understand the concept, data structure and preprocessing algorithms of Information retrieval. 2. Student should be able to deal with storage and retrieval process of text and multimedia data. 3. Student should be able to evaluate performance of any information retrieval system. 4. Students should be able to design user interfaces 5. Student should be able to understand importance of recommender system. (take decision on design parameters of recommender system.) 6. Student should be able to understand concept of multimedia and distributed information retrieval. 7. Students must be able to map the concepts of the subject on recent developments in the Information retrieval field
70	**6th / VIII**	Multimedia Techniques	414464C	1. To create own file formats for specific application 2. To do some projects based on current trends in multimedia 3. To use open sources for authoring tool for animation and presentations.
71	**6th / VIII**	Multimedia Techniques Laboratory	414464C	1. To create own file formats for specific application 2. To do some projects based on current trends in multimedia 3. To use open sources for authoring tool for animation and presentations.
72	**6th / VIII**	Internet and Web Programming	414464D	1. Demonstrate static website using basic tools. 2. Develop client side programming skills. 3. Develop server side programming skills. 4. Understand web services and handle content management tools. 5. Develop mobile website using mobile web development tools. 6. Understand aspects of web security and cyber ethics.

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Nutan Maharashtra Inst. of Engg. & Tech.
Talegaon Dabhade

Nutan Maharashtra Inst. of Engg. & Tech. PUNE 410507

73	6th / VIII	Internet and Web Programming Laboratory	414464D	1. Use fundamental skills to develop and maintain website and web application 2. Apply scripting skills for Server side and Client-side Programming 3. Develop web services to transfer data and add interactive components to website. 4. Combine multiple web technologies to create advanced web components
74	6th / VIII	Computational Optimization	414464E	1. Learn and implement various optimization techniques 2. Learn model real-world problems in optimization framework 3. Apply various optimization models to solve optimization problems in computer-science & IT Engineering.
75	6th / VIII	Computational Optimization Laboratory	414464E	1. understand Transportation problem 2. learn different measures in shortest path algorithms 3. understand and learn Queuing Model
76	6th / VIII	Rural Technologies and Community Development	414465A	1. understand rural development model 2. learn different measures in rural development and its impact on overall economy 3. understand and learn importance of technologies in rural and community development 4. understand challenges and opportunities in rural development.
77	6th / VIII	Parallel Computing	414465B	1. understand fundamentals in parallel computing 2. understand and learn importance of technologies including different hardware structures used in parallel computing 3. understand challenges and opportunities in parallel computing
78	6th / VIII	Computer Vision	414464C	1. To implement fundamental image processing techniques required for computer vision 2. To implement boundary tracking techniques 3. To apply Hough Transform for line, circle, and ellipse detections 4. To implement motion related techniques 5. to develop skills to develop applications using computer vision techniques

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Nutan Maharashtra Inst. of Engg. & Tech.
Talegaon Dabhade, Pune - 410 507

Nutan Maharashtra Inst. of Engg. & Tech. PUNE 410507

79	**6th / VIII**	Social Media Analytics	414464D	1. Understand the basics of Social Media Analytics 2. Explain the significance of Data mining in Social media 3. Demonstrate the algorithms used for text mining 4. Apply network measures for social media data 5. Explain Behavior Analytics techniques used for social media data 6. Apply social media analytics for Face book and Twitter kind of applications
80	**6th / VIII**	Open Elective	414465E	1. Demonstrate knowledge of the core concepts and techniques in distributed systems. 2. Learn how to apply principles of state-of-the-Art Distributed systems in practical application. 3. Design, build and test application programs on distributed systems.
90	**6th / VIII**	COMPUTER LABORATORY-X	414467	1. set up the Android environment and explain the Evolution of cellular networks (BT-2) 2. develop the User Interfaces using pre-built Android UI components (BT -6) 3. create applications for performing CURD SQLite database operations using Android(BT-6) 4. create the smart android applications using the data captured through sensors (BT-6) 5. implement the authentication protocols between two mobile devices for providing security (BT-3) 6. analyze the data collected through android sensors using any machine learning algorithm (BT4).
91	**6th / VIII**	Project Work	414468	1. learn teamwork. 2. be well aware about Implementation phase. 3. get exposure of various types of testing methods and tools. 4. understand the importance of documentation.

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