Program Educational Objectives   (PEOs)
I. Preparation
To provide opportunity **to learn and acquire knowledge** of basic mathematical, professional and technical fundamentals, so as to **prepare students** to succeed in technical **profession** at global level and to enable them to excel in **further education**.
II.Core competence
To **develop ability** among students to innovate, communicate, analyze, interpret and apply technical concepts to solve real life problems and **to create novel products**.
III.Breadth
To aware and **achievescientific and engineering breadth** amongst student through various curricular, co-curricular and extra-curricular activities.
IV. Professionalism
To inculcate professional and ethical attitude in students, enable them to excel in engineering profession.
V. Learning Environment
To accomplish overall development of the students; with the aid of **activity and project based learning environment**.

PROGRAM OUTCOMES (POs)
PO1 Engineering knowledge:
Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2 Problem analysis:
Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3 Design/development of solutions:
Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 Conduct investigations of complex problems:
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.

PO5 Modern tool usage:
Create , select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling 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.

PO7 Environment and sustainability:
Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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 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:
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological Change

First Year Engineering Credit System Syllabus 2015 Course

COURSE	CODE	SUBJECT	Course Objective
107001SEM I	C101	**Engineering Mathematics I**	1) Syste m of linea r equations aris ing in all engineering fields, using matrix methods, sta bility of eng ineer ing syste ms where knowledge of Eigen values and Eigen vectors are essentia l.
			2) /\lgebraic and transcendental equations
			3) Error analysi and approximations
			4) Ordinary ancl parlial differential eq uation s.
			5) Enginee ring applications such as vibration theory, heat transfer, electr ica l circuits etc
			6) Stationary values of functions (Maxima & Minima), arising in opt imization problems
107002	C102	Engineering Physics	1) To provide the basic concepts to resolve many engineer ing and technological pro bl ems.
			2) Aft er completing this course students will be able to appreciate and use the met hodologies to analyze and desi gn a wid e range of engineering Systems
			3) To use various techniques for M easureme nt , Calculation, Cont rol and Analysis of engineer ing problems based on the principles of Optics, Ultrasonic, Acoustics, Quant um Physics, Superconductivity, Laser, Physics of nano part iclesand Semicon ductor Physics.
			4)To understand the r ecent t rends cJn d advances in technology, thls requires precise cont rol over dynamics of macroscopic engineering systems
			5) Basic scienceslike Phy sics also invoke mani pulat ion of pr ocesses over micro- and even nano-scale level as there is a growing demand of solid understand ing of pr incip les of basic sciences.
			6)Physics provides the basic ideas and gives the solution for developing mathematical and analytical abilities wit h higher precision
107009	C103	Engineering Chemistry	1)Technology involvedin improving qualit y of water for its industrial use
			2) Basic concepts of Electro analytical techniques that facilit ate rapid and reliable measurements

			3) Chemical str uctur e of polymers and its effect of on their various properties when used as engineer ing materials. To lay foundation for the app lication of polymers for specific applications and as com posit e materials.
			4) Study of fossil fuels and derived fuels with its propertiesan d applicat ions.
			5) An insight into nano materialsand composite materialsaspect of modern chemistry
			6) The principles of chemical and electrochem ical react ions causing corrosion and methods used for minimizing corro sion.
102006	C104	Engineering Graphics I	*1. To develop imagination of Physical Objects to be represenied on Paper for Engineering Communication.*
			2 To develop the manual drawing Skill, drawing inlerprelution Skill
			3To develop the pl)lsical realisation of the dimension of the o jects
103004	C105	Basic Electrical Engineering	1. Understand and demonstrate the fundamentals of elect romagnetism, single phase transformers, electrostatics, and A.C. and D.C. circuits
			2)Apply concept of electromagnetism for the working of transformer
			3) Differentiate between electrical and magnetic circuit s.
			4) Compare between D.C and A.C circuits.
			5) Draw the phasor diagrams for single phase and three phase A.C circuits.
			6)Provide solution for the network by applying various laws and theorems.
			7) Obtain solutions for electr ical networks analyti call y and verify these results experimentally in laboratory.
			8) Demonstrate the awareness on social issues like conse rvat ion of electrical energy, electr ical safety etc.
			9)Develop abilities to excel in competitive exams required for post graduation and research.
104012	C106	Basic Electronic Engineering	1) To give know le dge of so rne basic elec t ronic com ponents and circu it s.
			2) To introduce basics of diode and transisto r cirl:uits.
			3) To understand working of some IC hl'ls <.:d circuits.
			4) To study log ic gates and their usage in digita l circuits.

			5)To expose the stude nts to working of some power elt:ctronic dev ices , t ra11s duce rs and application of trans ducers
			6) To introduce basic aspec t of elect ronic c ommun ic ation systems.
			7) The assoc iated Laboratory Pract ic a l co urse is designe d 10 understa nd working or various E lec tronic c ircuits. The students will understand how to use the basic test and measur ing
			instruments to test the c ircuit s.
101005	C107	Basic Civil and Environmental Engineering	
107008 SEM II	**C108**	**Engineering Mathematics II**	I) Modeling of variou_s physical systems such as Newton's Law of cooling, L-C-R circ uits,recti linear motion, mass-sp rin g systems heat transfer etc
			2)Design and analys is of co ntinuous and discrete system, where knowledge of Pourier series and Ila1m o nic ana lysis is required
			3)Ac..lvanced techniques to eva luate integ rals
			4)Measurement of arc lengths of various curves.
			5)Sphere, cone and cy linder that arise in vector calculus, electro-magnetic fie ld theory, cad-cam, computer graphics etc
			6)Multiple integrals which arc used in cak:ulating areas, volumes, mean and RMS values, mass, mome nt of inertia and centre of gravity
107009	C109	Engineering Chemistry	
107002	C110	Engineering Physics	
102013	C111	Basic Mechanical Engineering	1.Thi.s cou rse will help the student to acquire kno wle dge of mec hanica l engineering.
			2.Describe the scope of mechanical engineering with mult idisciplinary indust ries.
			3. Understand a11d identif y commo n machine elements with tl wir funct ions a nd power transm iss ion devices.
			4. Learn convent iona l mach ine tools and understand the concept of design i11 mech anical engineer ing.

			5. Impa rt knowledge of basic concepts of thermody namics appl ied to in dustrial appli ca tio ns.
			6.Understand laying princip les of energy co nversion systems and power plants.
			7.Understand laying princip les of energy co nversion systems and power plants.
101011	C112	Engineering Mechanics	
104012	C113	Basic Electronics Engineering OR	
103004	C114	Basic Electrical Engineering	
110010	C115	Fundamentals of Programming Languages II	1.To learn and acq llire art of compule::r p rog ra mming
			2. To k now about some popular programming lang uages and how ro choo.:;e n pro ramm ing lan guage for solving a pro blem using a comput e r
			3. To le a rn Lo foundfltion programming i11 t:mbe::d dcd C, 1\ dvanc:e d Prograrnrn ing
102014	C116	Engineering Graphics II	1) Pr onsof solids (Minimum Two Problems]
			2. Engineering Curves [Mini mum Two Problems]
			3. Development of Solids [Minimum Two Proble msl
			4. Orthographic projections[Mi nimum Two Proble ms]
			5.Iso metric projections (rvrinimum Two Problems]

Program Specific Outcomes (PSOs)Electrical dept.
1. Able to apply the knowledge gained during the course of the program from Mathematics, Basic Computing, Basic Sciences and Social Sciences in general and all electrical courses in particular to identify, formulate and solve real life problems faced in industries and/or during research work.
2. Able to provide practically/socially acceptable technical solutions to electrical engineering problems with the application of appropriate techniques.

3. Able to apply the knowledge of ethical and management principles required to work in a team as well as to lead a team.			
4. Recognize the need for professionalism, excellence, and continuous improvement			

<table>
<tr><td colspan="4" style="background:yellow">SE ELECTRICAL 2015 COURSE W.E.F. FROM 2016-17</td></tr>
<tr><td>COURSE</td><td>CODE</td><td>SUBJECT</td><td>Course Outcomes</td></tr>
<tr><td>203141SEM I</td><td>C201</td><td>Power Generation Technologies</td><td>1. Identify operations of thermal power plant with all accessories and cycles.</td></tr>
<tr><td></td><td></td><td></td><td>2.Be aware of the principle of operation, components, layout, location, environmental and social issues of nuclear, diesel and gas power plant.</td></tr>
<tr><td></td><td></td><td></td><td>3.Identify and demonstrate the components of hydro power plant and calculation of turbine required based on catchment area.</td></tr>
<tr><td></td><td></td><td></td><td>4.Find the importance of wind based energy generation along with its design, analysis and comparison.</td></tr>
<tr><td></td><td></td><td></td><td>5. Apply solar energy in thermal and electrical power generation considering energy crisis, environmental and social benefits.</td></tr>
<tr><td></td><td></td><td></td><td>6. Understand the operation of electrical energy generation using biomass, tidal, geothermal, hydel plants, fuel cell and interconnection with grid.</td></tr>
<tr><td>207006</td><td>C202</td><td>Engineering Mathematics- III</td><td>1. Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits.</td></tr>
<tr><td></td><td></td><td></td><td>2. Solve problems related to Laplace transform, Fourier transform, Z-Transform and applications to Signal processing and Control systems.</td></tr>
<tr><td></td><td></td><td></td><td>3. Perform vector differentiation and integration, analyze the vector fields and apply to Electro-Magnetic fields.</td></tr>
<tr><td></td><td></td><td></td><td>4.Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing.</td></tr>
<tr><td>203142</td><td>C203</td><td>Material Science</td><td>1. Categorize and classify different materials from Electrical Engineering applications point of view.</td></tr>
</table>

			2. Explain and summarize various properties and characteristics of different classes of materials.
			3. Choose materials for application in various electrical equipment.
			4. Explain and describe knowledge of nanotechnology, batteries and solar cell materials.
			5.Test different classes of materials as per IS
203143	C204	Analog and Digital Electronics	1.Understand conversion of number system, perform binary arithmetic and reduce Boolean expressions by K- Map.
			2. Demonstrate basics of various types of Flip flops, design registers and counter.
			3. Analyze parameter of Op-amp and its applications.
			4. Apply the knowledge of Op-amp as wave form generators & filters.
			5.Use BJT as amplifier with various configurations.
			6.Analysis of uncontrolled rectifier.
203144	C205	Electrical Measurements and Instrumentation	1.Understand various characteristics of measuring instruments, their classification and range extension technique.
			2. Classify resistance, apply measurement techniques for measurement of resistance, inductance.
			3.Explain construction, working principle and use of dynamometer type wattmeter for measurement of power under balance and unbalance condition.
			4.Explain Construction, working principle of 1-phase and 3-phase induction, static energy meter and calibration procedures.
			5.Use of CRO for measurement of various electrical parameters, importance of transducers, their classification, selection criterion and various applications.
			6. Measurement of various physical parameters using transducers.
203151	C206	Soft Skills	1. Do SWOT analysis.
			2. Develop presentation and take part in group discussion.
			3.Understand and Implement etiquettes in workplace and in society at large.
			4.Work in team with team spirit.
			5.Utilize the techniques for time management and stress management

203145SEM II	C207	Power System I	1. Recognize different patterns of load curve, calculate different factors associated with it and tariff structure for LT and HT consumers.
			2. Aware of features, ratings, application of different electrical equipment in power station and selection of overhead line insulators.
			3.Analyze and apply the knowledge of electrical and mechanical design of transmission lines.
			4.*Identify and analyze the performance of transmission lines.*
203146	C208	Electrical Machines I	1. Apply energy conversion principles to different machines.
			2.Select machine for specific applications.
			3.Test the various machine for performance calculation.
203147	C209	Network Analysis	1. Developing strong basics for network theory.
			2. Develop the problem solving technique for networks by application of theorems.
			3.Understand the behavior of the network by analyzing its transient response.
			4. Apply their knowledge of network theory for designing special circuits like filters.
203148	C210	Numerical Methods and Computer Programming	1. Develop algorithms and implement programs using C language for various numerical methods.
			2.Demonstrate types of errors in computation and their causes of occurrence.
			3. Identify various types of equations and apply appropriate numerical method to solve different equations.
			4.Apply different numerical methods for interpolation, differentiation and numerical integration.
			5.Apply and compare various numerical methods to solve first and second order ODE.
			6.Apply and compare various numerical methods to solve linear simultaneous equations.
203149	C211	Fundamentals of Microcontroller and Applications	1. Differentiate between microprocessor and microcontroller.
			2. Describe the architecture and features of various types of microcontroller.
			3.Demonstrate programming proficiency using the various addressing modes and all types of instructions of the target microcontroller.
			4.Program using the capabilities of the stack, the program counter the internal and external memory, timer and interrupts and show how these are used to execute a programme.

			5. Write assemble assembly language programs on PC and download and run their program on the training boards.
			6. Design electrical circuitry to the Microcontroller I/O ports in order to interface with external devices.
			7.Write assembly language programs and download the machine code that will provide solutions real-world control problems such as fluid level control, temperature control, and batch processes.

Program Specific Outcomes (PSOs)E&TC dept.

			1.Apply the fundamental concepts of electronics and telecommunication engineering to design a variety of systems for applications including embedded systems, VLSI, signal processing, image processing, communication, networking and control system.
			2.An ability to isolate and solve complex problems in the domain of Electronics and Communication using latest hardware and software tools, along with analytical and managerial skills to arrive at cost effective and optimum solutions

			SE E&TC 2015 COURSE W.E.FROM 2016-17

COURSE	CODE	SUBJECT	Course Outcomes
204181SEM I	C201	Signals & Systems	1. Understand mathematical description and representation of continuous and discrete time signals and systems.
			2. Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system.
			3. Understand and resolve the signals in frequency domain using Fourier series and Fourier transforms.
			4. Understand the limitations of Fourier transform and need for Laplace transform and develop the ability to analyze the system in s- domain.
			5. Understand the basic concept of probability, random variables & random signals and develop the ability to find correlation, CDF, PDF and probability of a given event.

204182	C202	Electronic Devices & Circuits	1. Comply and verify parameters after exciting devices by any stated method.
			2. Implement circuit and test the performance.
			3. Analyze small signal model of FET and MOSFET.
			4. Explain behavior of FET at low frequency.
			5. Design an adjustable voltage regulator circuits.
204183	C203	Electrical Circuits and Machines	1. Analyze basic AC & DC circuit for voltage, current and power by using KVL, KCL, andnetwork theorems.
			2. Explain the working principle of different electrical machines.
			3. Select proper electrical motor for given application.
			4. Design and analyze transformers.
204184	C204	Data Structures and Algorithms	1. Discuss the computational efficiency of the principal algorithms such as sorting & searching.
			2. Write and understand the programs that use arrays & pointers in C
			3. Describe how arrays, records, linked structures are represented in memory and use them in algorithms.
			4. Implement stacks & queues for various applications.
			5. Understand various terminologies and traversals of trees and use them for various applications.
			6. Understand various terminologies and traversals of graphs and use them for various applications.
204185	C205	Digital Electronics	1. Use the basic logic gates and various reduction techniques of digital logic circuit in detail.
			2. Design combinational and sequential circuits.
			3. Design and implement hardware circuit to test performance and application.
			4. Understand the architecture and use of microcontrollers for basic operations and Simulate using simulation software.
204186	C206	Electronic Measuring Instruments & Tools	1. Understand fundamental of various electrical measurements.
			2. Understand and describe specifications, features and capabilities of electronic instruments.

			3. Finalize the specifications of instrument and select an appropriate instrument for given measurement.
			4. Carry out required measurement using various instruments under different setups.
			5. Able to compare measuring instruments for performance parameters
			6.Select appropriate instrument for the measurement of electrical parameter professionally
204192	C207	Audit Course 1	1.Changes in awareness levels, knowledge and understanding
			2.A change in attitudes / behavior e.g. against drink-drive;
			3.Casualty Reduction;
			4. That remedial education for those who make mistakes and for low level offences where this is more effective than financial penalties and penalty points;
			5. Improving Road Safety Together
207005 SIM II	C208	Engineering Mathematics III	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 Communication systems and Signal processing.
			3. Obtain Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing
			4. Perform vector differentiation and integration, analyze the vector fields and apply to Electro-Magnetic fields.
			5. Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing.
204187	C209	Integrated Circuits	1. Understand the characteristics of IC and Op-Amp and identify the internal structure.
			2. Understand and identify various manufacturing techniques.
			3. Derive and determine various performances based parameters and their significance for Op-Amp.
			4. Comply and verify parameters after exciting IC by any stated method.
			5. Analyze and identify the closed loop stability considerations and I/O limitations.
			6. Analyze and identify linear and nonlinear applications of Op-Amp.
			7. Understand and verify results (levels of V & I) with hardware implementation.

			8. Implement hardwired circuit to test performance and application for what it is being designed.
			9.Understand and apply the functionalities of PLL to Frequency synthesizer, multiplier, FM, and AM demodulators
204188	C210	Control Systems	1.Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems.
			2. Determine the (absolute) stability of a closed-loop control system.
			3. Perform time domain and frequency domain analysis of control systems required for stability analysis.
			4.Perform time domain and frequency domain correlation analysis.
			5.Apply root-locus, Frequency Plots technique to analyze control systems.
			6.Express and solve system equations in state variable form
204189	C211	Analog Communication	1. Understand and identify the fundamental concepts and various components of analogcommunication systems.
			2. Explain signal to noise ratio, noise figure and noise temperature for single and cascaded stages in a communication system.
			3. Describe analog pulse modulation techniques and digital modulation technique.
			4. Develop the ability to compare and contrast the strengths and weaknesses of variouscommunication systems
204190	C212	Object Oriented Programming	1. Describe the principles of object oriented programming.
			2. Apply the concepts of data encapsulation, inheritance in C++.
			3. Understand basic program constructs in Java
			4. Apply the concepts of classes, methods and inheritance to write programs Java
			5. Use arrays, vectors and strings concepts and interfaces to write programs in Java.
			6. Describe and use the concepts in Java to develop user friendly program,
204191	C213	Employability Skill Development	1. Have skills and preparedness for aptitude tests.
			2. Be equipped with essential communication skills (writing, verbal and non-verbal)

COURSE	CODE	SUBJECT	Course Outcomes
			3. Master the presentation skill and be ready for facing interviews.
			4. Build team and lead it for problem solving.
204193	C214	Audit Course 2	1. will have ability of basic communication.
			2.will have the knowledge of Japanese script.
			3. will get introduced to reading , writing and listening skills
			4.will develop interest to pursue professional Japanese Language course.

Program Specific Outcomes (PSOs) Mechanical dept.

1. Ability to critical analysis and problem-solving skills required in the field of Thermal, Production and design engineering for carrying out research activities.		
2. Ability to conduct experiment and simulate the real life situations involved in engineering using computational techniques and instrumentation; and can work independently in research or industrial environments.		

			SE MECHANICAL 2015 COURSE W.E.F 2016

COURSE	CODE	SUBJECT	Course Outcomes
207002 SEM I	C201	Engineering Mathematics – III	1) Solve higher order linear differential equations and apply to modeling and analyzing mass spring systems.
			2) Apply Laplace transform and Fourier transform techniques to solve differential equations involved in Vibration theory, Heat transfer and related engineering applications.
			3) Apply statistical methods like correlation, regression analysis in analyzing, interpreting experimental data and probability theory in testing and quality control.
			4) Perform vector differentiation and integration, analyze the vector fields and apply to fluid flow problems
			5) Solve various partial differential equations such as wave equation, one and two dimensional heat flow equations.
202041	C202	Manufacturing Process-I	1.Understand and analyze foundry practices like pattern making, mold making, Core making and Inspection of defects.

			2. Understand and analyze Hot and Cold Working, Rolling, Forging, Extrusion and Drawing Processes.
			3. Understand different plastic molding processes, Extrusion of Plastic and Thermoforming
			4. Understand different Welding and joining processes and its defects
			5. Understand, Design and Analyze different sheet metal working processes
			6.Understand the constructional details and Working of Centre Lathe
202042	C203	Computer Aided Machine Drawing	1.Understand the importance of CAD in the light of allied technologies such as CAM, CAE, FEA, CFD, PLM.
			2.Understand the significance of parametric technology and its application in 2D sketching
			3.Understand the significance of parametric feature-based modeling and its application in 3D machine components modeling
			4. Ability to create 3D assemblies that represent static or dynamic Mechanical Systems.
			5.Ability to ensure manufacturability and proper assembly of components and assemblies
			6. Ability to communicate between Design and Manufacturing using 2D drawings.
202043	C204	Thermodynamics	1.Apply various laws of thermodynamics to various processes and real systems.
			2. Apply the concept of Entropy, Calculate heat, work and other important thermodynamic properties for various ideal gas processes
			3. Estimate performance of various Thermodynamic gas power cycles and gas refrigeration cycle and availability in each case.
			4.Estimate the condition of steam and performance of vapour power cycle and vapour compression cycle
			5.Estimate Stoichiometric air required for combustion, performance of steam generators and natural draught requirements in boiler plants
			6.Use Psychromertic charts and estimate various essential properties related to Psychrometry and processes
202044	C205	Material Science	1. Understand the basic concepts and properties of Material.
			2.Understand about material fundamental and processing
			3.Select proper metal, alloys, nonmetal and powder metallurgical component for specific requirement
			4. Detect the defects in crystal and its effect on crystal properties

			5.Evaluate the different properties of material by studying different test
			6.Recognize how metals can be strengthened by cold-working and hot working
202051	C206	Strength of Materials	1. Apply knowledge of mathematics, science for engineering applications
			2.Design and conduct experiments, as well as to analyze and interpret data
			3.Design a component to meet desired needs within realistic constraints of health and safety
			4. Identify, formulate, and solve engineering problems
			5. Practice professional and ethical responsibility
			6.Use the techniques, skills, and modern engineering tools necessary for engineering practice
202054	C207	Value Education	1.Understood human values, their significance and role in life.
			2.Promote self-reflection and critical inquiry that foster critical thinking of one's value and the values of others
			3.Practice respect for human rights and democratic principles.
			4. Familiarized with various living and non-living organisms and their interaction with environment
			5. Understood the basics regarding the leadership and to become a conscious professional.
202054 A		Innovations in Engineering Field/ Agriculture	1. Understand what is thinking, its tools and process and its application to innovation
			2.Practice application of innovation in engineering
			3. Understand important terms like national productivity, sustainable development and inclusive growth
			4.Throw a light on developing technologies in agriculture
			5. Learn Interdisciplinary Engineering applications in Agriculture
202054 B		Road Safety	1. Generate awareness about number of people dyeing every year in road accidents, traffic rules and characteristics of accident
			2.Gain information and knowledge about people responsible for accidents and their duties
			3.Understand the importance of multidisciplinary approach to planning for traffic safety and rehabilitation
			4. Acquire a certificate of coordination/ participation in compulsory events based on the topic under study
202045 SEM II	C208	Fluid Mechanics	1.Use of various properties in solving the problems in fluids

			2. Use of Bernoulli's equation for solutions in fluids
			3.Determination of forces drag and lift on immersed bodies
202047	C209	Soft Skills	1.Improved communication, interaction and presentation of ideas
			2.Right attitudinal and behaviouralchange
			3.Developed right-attitudinal and behavioral change
202048	C210	Theory of Machines – I	1.Identify mechanisms in real life applications.
			2.Perform kinematic analysis of simple mechanisms.
			3.Perform static and dynamic force analysis of slider crank mechanism.
			4.Determine moment of inertia of rigid bodies experimentally.
			5.Analyze velocity and acceleration of mechanisms by vector and graphical methods.
202049	C211	Engineering Metallurgy	1. describe how metals and alloys formed and how the properties change due to microstructure
			2.apply core concepts in Engineering Metallurgy to solve engineering problems.
			3.conduct experiments, as well as to analyze and interpret data
			4. select materials for design and construction
			5. possess the skills and techniques necessary for modern materials engineering practice
			6. recognize how metals can be strengthened by alloying, cold-working, and heat treatment
202050	C212	Applied Thermodynamics	1. Classify various types of Engines, Compare Air standard, Fuel Air and Actual cycles and make out various losses in real cycles
			2.Understand Theory of Carburetion, Modern Carburetor, Stages of Combustion in S. I. Engines and Theory of Detonation, Pre-ignition and factors affecting detonation.
			3.Understand Fuel Supply system, Types of Injectors and Injection Pumps, Stages of Combustion in CI Engines, Theory of Detonation in CI Engines and Comparison of SI and CI Combustion and Knocking and Factors affecting, Criteria for good combustion chamber and types
			4. Carry out Testing of I. C. Engines and analyze its performance.
			5. Describe construction and working of various I. C. Engine systems (Cooling, Lubrication, Ignition, Governing, and Starting) also various harmful gases emitted from exhaust and different devices to control pollution and emission norms for pollution control.
			6. Describe construction, working of various types of reciprocating and rotary compressors with performance calculations of positive displacement compressors

COURSE	CODE	SUBJECT	Course Outcomes
203152	C213	Electrical and Electronics Engineering	1. Develop the capability to identify and select suitable DC motor / induction motor / special purpose motor and its speed control method for given industrial application.
			2. Program Arduino IDE using conditional statements
			3. Interfacing sensors with Arduino IDE

Program Specific Outcomes (PSOs) ITdept

1.An ability to apply the theoretical concepts and practical knowledge of Information Technology in analysis, design, development and management of information processing systems and applications in the interdisciplinary domain.

2.An ability to analyze a problem, and identify and define the computing infrastructure and operations requirements appropriate to its solution. IT graduates should be able to work on large-scale computing systems.

3.An understanding of professional, business and business processes, ethical,legal, security and social issues and responsibilities

		SE IT 2015 COURSE WITHEFFECT FROM 2016-17	
COURSE	**CODE**	**SUBJECT**	**Course Outcomes**
214441SEM I	C201	Discrete Structures	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.
214442	C202	Computer Organization & Architecture	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 multi-processors & multi core systems.

214443	C203	Digital Electronics and Logic Design	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
214444	C204	Fundamentals of Data Structures	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 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
214445	C205	Problem Solving and Object Oriented programming	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
214446	C206	Digital Laboratory	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.
214447	C207	Programming Laboratory	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 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
214448	C208	Object Oriented programming Lab.	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
214449	C209	Communication Skills	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.

207003 SEM II	C210	Engineering Mathematics -III	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
			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.
214450	C211	Computer Graphics	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
214451	C212	Processor Architecture and Interfacing	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
214452	C213	Data Structures & Files	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

214453	C214	Foundations of Communication and Computer Network	1. Understand data/signal transmission over communication media
			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
214454	C215	Processor Interfacing Laboratory	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
214455	C216	Data Structure and Files Laboratory	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
214456	C217	Computer Graphics Laboratory	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
		Program Specific Outcomes (PSOs)Computer dept.	

			1. Professional Skills-The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexities.
			2. Problem-Solving Skills- The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.
			3. Successful Career and Entrepreneurship- The ability to employ modern computer languages, environments and platforms in creating innovative career paths to be an entrepreneur and to have a zest for higher studies.

		SE COMPUTER 2015 COURSE WITH EFFECT FROM 2016	
COURSE	**CODE**	**SUBJECT**	**Course Outcomes**
210241 SEMI	C201	Discrete Mathematics	1. Solve real world problems logically using appropriate set, function, and relation models and interpret the associated operations and terminologies in context
			2.Analyze and synthesize the real world problems using discrete mathematics.
210242	C202	Digital Electronics and Logic Design	1. Realize and simplify Boolean Algebraic assignments for designing digital circuits using K-Maps.
			2.Design and implement Sequential and Combinational digital circuits as per the specifications.
			3.Apply the knowledge to appropriate IC as per the design specifications.
			4.Design simple digital systems using VHDL.
			5. Develop simple embedded system for simple real world application.
210243	C203	Data Structures and Algorithms	1. To discriminate the usage of various structures in approaching the problem solution.
			2. To design the algorithms to solve the programming problems.
			3. To use effective and efficient data structures in solving various Computer Engineering domain problems.
			4.To analyze the problems to apply suitable algorithm and data structure
			5.To use appropriate algorithmic strategy for better efficiency

210244	C204	Computer Organization and Architecture	1. Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os.
			2.Analyze the principles of computer architecture using examples drawn from commercially available computers
			3.Evaluate various design alternatives in processor organization.
210245	C205	Object Oriented Programming	1. Analyze the strengths of object oriented programming
			2. Design and apply OOP principles for effective programming
			3.Develop programming application using object oriented programming language C++
			4. Percept the utility and applicability of OOP
210249	C206	Soft Skills	1.Effectively communicate through verbal/oral communication and improve the listening skills
			2. Write precise briefs or reports and technical documents.
			3.Actively participate in group discussion / meetings / interviews and prepare & deliver presentations
			4. Become more effective individual through goal/target setting, self motivation and practicing creative thinking
			5. Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality
210250	C207	AC1-II: Humanities and Social Sciences	1.Making engineering and technology students aware of the various issues concerning man and society
			2. These issues will help to sensitize students to be broader towards the social, cultural, economic and human issues, involved in social changes
			3.Able to understand the nature of the individual and the relationship between the self and the community
			4.Understanding major ideas, values, beliefs, and experiences that have shaped human history and cultures
210250	C208	AC1-III: Environmental Studies	1.Comprehend the importance of ecosystem and biodiversity

			2.To correlate the human population growth and its trend to the environmental degradation and develop the awareness about his/her role towards environmental protection and prevention
			3.Identify different types of environmental pollution and control measures
			4.To correlate the exploitation and utilization of conventional and non-conventional resources
210250	C209	AC1-IV: Smart Cities	1. *Better understanding of the dynamic behavior of the urban system by going beyond the physical appearance and* by focusing on representations, properties and impact factors
			2. Exploration of the city as the most complex human-made organism with a metabolism that can be modeled in terms of stocks and flows
			3. Knowledge about data-informed approaches for the development of the future city, based on crowd sourcing and sensing
			4.Knowledge about the latest research results in for the development and management of future cities
			5. Understanding how citizens can benefit from data-informed design to develop smart and responsive cities
207003 SEM II	C210	Engineering Mathematics III	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
			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.
210251	C211	Computer Graphics	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.

210252	C212	Advanced Data Structures	1.To apply appropriate advanced data structure and efficient algorithms to approach the problems of various domain
			2.To design the algorithms to solve the programming problems.
			3. To use effective and efficient data structures in solving various Computer Engineering domain problems
			4.To analyze the algorithmic solutions for resource requirements and optimization
			5. To use appropriate modern tools to understand and analyze the functionalities confined to the data structure usage.
210253	C213	Microprocessor	1. To apply the assembly language programming to develop small real life embedded application.
			2. To understand the architecture of the advanced processor thoroughly to use the resources for programming.
			3.To understand the higher processor architectures descended from 80386 architecture.
210254	C214	Principles of Programming Languages	1. To analyze the strengths and weaknesses of programming languages for effective and efficient program development.
			2. To inculcate the principles underlying the programming languages enabling to learn new programming languages
			3.To grasp different programming paradigms.
			4. To use the programming paradigms effectively in application development.
210258	C215	AC2-I: Water Management	1.Understanding of the global water cycle and its various processes.
			2.Understanding of climate change and their effects on water systems.
			3. Understanding of Drinking treatment and quality of groundwater and surface water
			4. Understanding of the Physical, chemical, and biological processes involved in water treatment and distribution
210258	C216	AC2-II: Intellectual Property Rights and Patents	1.Understand the fundamental legal principles related to confidential information, copyright, patents, designs, trademarks and unfair competition
			2.Identify, apply and assess principles of law relating to each of these areas of intellectual property

COURSE	CODE	SUBJECT	Course Outcomes
			3.Apply the appropriate ownership rules to intellectual property you have been involved in creating
210258	C217	AC2-III : The Science of Happiness	1.Ability to understand what happiness is and why it matters to you
			2.Ability to learn how to increase your own happiness
			3. Understanding of the power of social connections and the science of empathy
			4.Ability to understand what is mindfulness and its real world applications
210258	C218	AC2-IV: Stress Relief: Yoga and Meditation	1.Students understanding of philosophy and religion as well as daily life issues will be challenged and enhanced
			2.Enhances the immune system.
			3.Intellectual and philosophical understanding of the theory of yoga and basic related Hindu scriptures will be developed
			4. Powers of concentration, focus, and awareness will be heightened.
		TE Electrical Engineering (2015 COURSE W.E.F.A.Y. 2017-18)	
COURSE	**CODE**	**SUBJECT**	**Course Outcomes**
311121 SEM-I	**C301**	**Industrial and Technology Management**	1. Differentiate between different types of business organization and discuss the fundamentals of economics and management.
			2.Explain the importance of technology management and quality management.
			3.Describe the characteristics of marketing and its types.
			4. Discuss the qualities of a good leader.
303141	C302	Advance Microcontroller and its Application	1.Explain architecture of PIC18F458 microcontroller, its instructions and the addressing modes.
			2.Develop and debug program in assembly language or C language for specific applications
			3. Use of an IDE for simulating the functionalities of PIC microcontroller and its use for software and hardware development
			4. Interface a microcontroller to various devices.
			5.Effectively utilize advance features of microcontroller peripherals.

303142	C303	Electrical Machines II	1. Learn construction & working principle of three phase synchronous machines.
			2.Define regulation of alternator & calculate it by direct and indirect methods.
			3. Study the methods of starting 3- phase synchronous motor, & its operation under Different conditions.
			4. Learn Speed control methods of three phase induction motor.
			5.Develop phasor diagram & circle diagram of a c series motor.
			6.Develop equivalent circuit of single phase induction motor.
303143	C304	Power Electronics	1. Develop characteristics of different power electronic switching devices.
			2. Reproduce working principle of power electronic converters for different types of loads.
			3.Analyse the performance of power electronic converters.
303144	C305	Electrical Installation,Maintenance and Testing	1. Classify distribution systems, its types and substations.
			2.Design of different earthing systems for residential and industrial premises.
			3.Select methods of condition monitoring and testing of various Electrical Equipments.
			4.Estimate and Costing of residential and industrial premises.
303145	C306	Seminar and Technical Communication	1. Relate with the current technologies and innovations in Electrical engineering.
			2.Improve presentation and documentation skill.
			3.Apply theoretical knowledge to actual industrial applications and research activity.
			4. Communicate effectively.
303146 SEM-II	**C308**	**Power System II**	1.Solve problems involving modelling, design and performance evaluation of HVDC and EHVAC power transmission lines.
			2.Evaluate power flow in power transmission networks and apply power flow results to solve simple planning problems.
			3. Calculate currents and voltages in a faulted power system under both symmetrical and asymmetrical faults, and relate fault currents to circuit breaker ratings.
303147	C309	Control System I	1.Model physical system,
			2.Determine time response of linear system,
			3.Analyse stability of LTI system,

			4.Design PID controller for LTI system
303148	C310	Utilization of Electrical Energy	1.Ensure that the knowledge acquired can be applied in various fields such as electric heating, illumination, chemical processes, and electric traction.
			2. Make the students aware about the importance of maximizing the energy efficiency by optimum utilization of electrical energy.
			3. Develop ability amongst the students to design -heating element for resistance furnaces and design- illumination schemes. To develop ability amongst the students to analyze the performance of arc furnaces, electric traction, different sources of light, illumination schemes
			4.Provide know how about Refrigeration, Air Conditioning
			5. Provide know about electrochemical processes and applications of these in practical world, modern welding techniques.
			6. Develop self and lifelong learning skills, introduce professionalism for successful career.
303149	C311	Design of Electrical Machines	1.Calculate main dimensions and Design of single phase and three phase transformer.
			2.Calculate main dimensions of three phase Induction motor.
			3.Determine the parameters of transformer.
			4.Determine parameters of three phase Induction motor.
303150	C312	Energy Audit and Management	1.To get knowledge of BEE Energy policies, Electricity Acts.
			2.Use various energy measurement and audit instruments.
			3.Carry out preliminary energy audit of various sectors
			4. Enlist energy conservation and demand side measures for electrical, thermal and utility Systems.
			5.Solve simple problems on cost benefit analysis.
303151	C313	Electrical Workshop	1.Integrate electrical/electronic circuits for useful applications
			2.Acquire hardware skills to fabricate circuits designed.
			3.Read data manuals/data sheets of different items involved in the circuits.
			4. Test and debug circuits.
			5. Produce the results of the testing in the form of report.
	TE Information Tecgnology (2015 COURSE W.E.F.A.Y. 2017-18)		

COURSE	CODE	SUBJECT	Course Outcomes
314441 SEM-I	**C301**	**Theory of Computation**	1. To construct finite state machines to solve 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.
314442	C302	Database Management Systems	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.
314443	C303	Software Engineering & Project Management	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.
314444	C304	Operating System	1. Fundamental understanding of the role of Operating Systems.
			2. To understand the concept of a process and 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
314445	C305	Human -Computer Interaction	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.
314446	C306	Software Laboratory- I	1. Understand the fundamental concepts of database management. These concepts include aspects of database design, database languages, and database-system implementation.
			2. To provide a strong formal foundation in database concepts, recent technologies and best industry practices.
			3. To give systematic database design approaches covering conceptual design, logical design and an overview of physical design.
			4. To learn the SQL and NoSQL database system.
			5. To learn and understand various Database Architectures and its use for application development.
			6. To programme PL/SQL including stored procedures, stored functions, cursors and packages.
314447	C307	Software Laboratory- II	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.
			6. To develop the system program for the functioning of OS concepts in kernel space like embedding the system call in any Linux kernel
314448	C308	Software Laboratory- III	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.
314449	C309	Audit Course 3	
		AC3- I : Green Construction & Design	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.
		Audit Course 3 - II : Leadership and Personality Development	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.
		Audit Course 3 – III : Professional Ethics and Etiquettes	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.
		Audit Course 3 – IV : Digital & Social Media Marketing	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.

314450 SEM-II	C310	Computer Network Technology	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.
314451	C311	Systems Programming	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.
314452	C312	Design and Analysis of Algorithms	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.
314453	C313	Cloud Computing	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.
314454	C314	Data Science & Big Data Analytics	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.
314455	C315	Software Laboratory- IV	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.
			5. To explore use of protocols in various wired and wireless applications.
			6. To develop applications on emerging trends.
314456	C316	Software Laboratory- V	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.
314457	C317	Software Laboratory- VI	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.
314458	C318	Project Based Seminar	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.

COURSE	CODE	SUBJECT	
			6. To understand scientific approach for literature survey and paper writing.
314459	C319	Audit Course 4	
		Audit Course 4 - I : Intellectual Property Rights and Patenting	1. To understand Intellectual Property Rights (IPR).
			2. To explore applications of Trademark, Industrial Designs, Copyright and Trade Secret.
			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.

	TE Mechanical Engineering (2015 COURSE W.E.F.A.Y. 2017-18)		
COURSE	**CODE**	**SUBJECT**	**Course Outcomes**
302041 SEM I	**C301**	**Design of Machine Elements-I**	1. Ability to identify and understand failure modes for mechanical elements and design of machine elements based on strength.
			2. Ability to design Shafts, Keys and Coupling for industrial applications.
			3. Ability to design machine elements subjected to fluctuating loads.
			4. Ability to design Power Screws for various applications.
			5. Ability to design fasteners and welded joints subjected to different loading conditions.
			6. Ability to design various Springs for strength and stiffness.
302142	C302	Heat Transfer	CO 1: Analyze the various modes of heat transfer and implement the basic heat conduction equations for steady one dimensional thermal system.
			CO 2: Implement the general heat conduction equation to thermal systems with and without internal heat generation and transient heat conduction.
			CO 3: Analyze the heat transfer rate in natural and forced convection and evaluate through experimentation investigation.
			CO 4: Interpret heat transfer by radiation between objects with simple geometries. CO 5: Analyze the heat transfer equipment and investigate the performance.
302043	C303	Theory of Machines -II	1. Student will be able to understand fundamentals of gear theory which will be the prerequisite for gear design.

			2. Student will be able to perform force analysis of Spur, Helical, Bevel, Worm and Worm gear.
			3. The student to analyze speed and torque in epi-cyclic gear trains which will be the prerequisite for gear box design.
			4. Student will be able to design cam profile for given follower motions and understand cam Jump phenomenon, advance cam curves.
			5. The student will synthesize a four bar mechanism with analytical and graphical methods.
			6. a. The student will analyze the gyroscopic couple or effect for stabilization of Ship Aeroplane and Four wheeler vehicle. b. Student will choose appropriate drive for given application (stepped / step-less).
302044	C304	Turbo Machines	1. Apply thermodynamics and kinematics principles to turbo machines.
			2. Analyze the performance of turbo machines.
			3. Ability to select turbo machine for given application.
			4. Predict performance of turbo machine using model analysis.
302045	C305	Metrology and Quality Control	1. Understand the methods of measurement, selection of measuring instruments / standards of measurement, carryout data collection and its analysis.
			2. Explain tolerance, limits of size, fits, geometric and position tolerances and gauge design
			3. Understand and use/apply Quality Control Techniques/ Statistical Tools appropriately.
			4. Develop an ability of problem solving and decision making by identifying and analyzing the cause for variation and recommend suitable corrective actions for quality improvement.
302047 SEM II	C307	Numerical Methods and Optimization	1. Use appropriate Numerical Methods to solve complex mechanical engineering problems.
			2. Formulate algorithms and programming.
			3. Use Mathematical Solver.
			4. Generate Solutions for real life problem using optimization techniques.
			5. Analyze the research problem
302048	C308	Design of Machine Elements-II	CO 1: To understand and apply principles of gear design to spur gears and industrial spur gear boxes.
			CO 2 : To become proficient in Design of Helical and Bevel Gear
			CO 3: To develop capability to analyse Rolling contact bearing and its selection from manufacturer's Catalogue.

			CO 4: To learn a skill to design worm gear box for various industrial applications.
			CO 5: To inculcate an ability to design belt drives and selection of belt, rope and chain drives. CO 6: To achieve an expertise in design of Sliding contact bearing in industrial applications.
302049	C309	Refrigeration and Air Conditioning	1.Illustrate the fundamental principles and applications of refrigeration and air conditioning system
			2.Obtain cooling capacity and coefficient of performance by conducting test on vapour compression refrigeration systems
			3.Present the properties, applications and environmental issues of different refrigerants.
			4.Calculate cooling load for air conditioning systems used for various.
			5. Operate and analyze the refrigeration and air conditioning systems.
302050	C310	Mechatronics	1. Identification of key elements of mechatronics system and its representation in terms of block diagram.
			2.Understanding the concept of signal processing and use of interfacing systems such as ADC, DAC, digital I/O.
			3. Interfacing of Sensors, Actuators using appropriate DAQ micro-controller.
			4. Time and Frequency domain analysis of system model (for control application)
			5.PID control implementation on real time systems
			6.Development of PLC ladder programming and implementation of real life system.
302051	C311	Manufacturing Process-II	1. Student should be able to apply the knowledge of various manufacturing processes.
			2. Student should be able to identify various process parameters and their effect on processes.
			3. Student should be able to figure out application of modern machining.
			4. Students should get the knowledge of Jigs and Fixtures for variety of operations.
302052	C312	MACHINE SHOP – II	1. Ability to develop knowledge about the working and programming techniques for various machines and tools
302053	C313	Mechanical & Automobile **Seminar**	1. Establish motivation for any topic of interest and develop a thought process for technical presentation.
			2. Organize a detailed literature survey and build a document with respect to technical publications.
			3.Analysis and comprehension of proof-of-concept and related data.
			4.Effective presentation and improve soft skills.

COURSE	CODE	SUBJECT	
			5. Make use of new and recent technology (e.g. Latex) for creating technical reports
302054	C314	Audit Course	
		Fire & Safety Technology	1. To create and sustain a community of learning in which students acquire knowledge in fire, safety and hazard management and learn to apply it professionally with due consideration for ethical, human life & property safety issues.
			2. To pursue research and development in fire safety engineering, hazard management and disseminate its findings.
			3. To meet the challenges of today and tomorrow in the most effective, efficient and contemporary educational manner.
			4. To help in building national capabilities in fire safety engineering, disaster management, hazard management, industrial safety education through practical training to ensure a fire safe nation.
		Audit Course II - Entrepreneurship Development	1. Appreciate the concept of Entrepreneurship
			2. Identify entrepreneurship opportunity.
			3.Develop winning business plans
		Audit Course IV - Lean Management	1. Will be able to do practice Lean Management at the workplace
			2.Will be able to contribute in Continuous Improvement program of the Organization
		Audit Course V - Smart Manufacturing	1. Comfortable with terminology and practices in Smart Manufacturing
			2.Able to face the challenges in Industry & also contribute towards advancement.
			3. Active part of Industry 4.0 (Fourth Industrial Revolution)

		TE E & TC (2015 COURSE W.E.F.A.Y. 2017-18)	
COURSE	**CODE**	**SUBJECT**	**Course Outcomes**

304181 SEM I	C301	Digital Communication	1) Understand working of waveform coding techniques and analyse their performance.
			2) Analyze the performance of a baseband and pass band digital communication system in terms of error rate and spectral efficiency.
			3) Perform the time and frequency domain analysis of the signals in a digital communication system.
			4) Design of digital communication system.
			5) Understand working of spread spectrum communication system and analyze its performance.
304182	C302	Digital Signal Processing	1) Analyze the discrete time signals and system using different transform domain techniques.
			2) Design and implement LTI filters for filtering different real world signals.
			3) Develop different signal processing applications using DSP processor.
304183	C303	Electromagnetics	1) Understand the basic mathematical concepts related to electromagnetic vector fields.
			2) Apply the principles of electrostatics to the solutions of problems relating to electric field and electric potential, boundary conditions and electric energy density.
			3) Apply the principles of magnetostatics to the solutions of problems relating to magnetic field and magnetic potential, boundary conditions and magnetic energy density.
			4) Understand the concepts related to Faraday's law, induced emf and Maxwell's equations.
			5) Apply Maxwell's equations to solutions of problems relating to transmission lines and uniform plane wave propagation.
304184	C304	Microcontrollers	1) Learn importance of microcontroller in designing embedded application.
			2) Learn use of hardware and software tools.
			3) Develop interfacing to real world devices.
304185	C305	Mechantronics	1 Identification of key elements of mechatronics system and its representation in terms of block diagram.
			2 Understanding basic principal of Sensors and Transducer.
			3. Able to prepare case study of the system given.
304193	C308	Electronics System Design	1. Apply the fundamental concepts and working principles of electronics devices to design electronics systems.
			2. Shall be able to interpret datasheets and thus select appropriate components and devices
			3. Select appropriate transducer and signal conditioning circuit to design prototype of Data Acquisition system.

			4. Design an electronic system/sub-system and validate its performance by simulating the same.
			5. Shall be able to use an EDA tool for circuit schematic and simulation.
			6. Create, manage the database and query handling using suitable tools.
304186 SEM II	C310	**Power Electronics**	1.Design & implement a triggering / gate drive circuit for a power device
			2.Understand, perform & analyze different controlled converters.
			3.Evaluate battery backup time & design a battery charger.
			4.) Design & implement over voltage / over current protection circuit.
304187	C311	Information Theory, Coding and Communication Network	1. Perform information theoretic analysis of communication system.
			2.Design a data compression scheme using suitable source coding technique.
			3. Design a channel coding scheme for a communication system.
			4. Understand and apply fundamental principles of data communication and networking.
			5.Apply flow and error control techniques in communication networks.
304188	C312	Business Management	1. Get overview of Management Science aspects useful in business.
			2.Get motivation for Entrepreneurship
			3.Get Quality Aspects for Systematically Running the Business
			4.To Develop Project Management aspect and Entrepreneurship Skills.
304189	C313	Advanced Processors	1.Describe the ARM microprocessor architectures and its feature.
			2. Interface the advanced peripherals to ARM based microcontroller
			3.Design embedded system with available resources.
			4.Use of DSP Processors and resources for signal processing applications.
304190	C314	System Programming and Operating Systems	1) Demonstrate the knowledge of Systems Programming and Operating Systems
			2) Formulate the Problem and develop the solution for same.
			3) Compare and analyse the different implementation approach of system programming operating system abstractions.
			4) Interpret various OS functions used in Linux / Ubuntu

COURSE	CODE	SUBJECT	Course Outcomes
304196	C317	Employability Skill and Mini Project	1.Understand, plan and execute a Mini Project with team.
			2. Implement electronic hardware by learning PCB artwork design, soldering techniques, testing and troubleshooting etc.
			3. Prepare a technical report based on the Mini project.
			4.Deliver technical seminar based on the Mini Project work carried out.

COURSE	CODE	SUBJECT	Course Outcomes
310241 SEM-I	**C301**	**Theory of Computation**	1.design deterministic Turing machine for all inputs and all outputs
			2.subdivide problem space based on input subdivision using constraints
			3.apply linguistic theory
310242	C302	Database Management Systems (DBMS)	1.Design E-R Model for given requirements and convert the same into database tables.
			2. Use database techniques such as SQL & PL/SQL.
			3. Use modern database techniques such as NOSQL.
			4. Explain transaction Management in relational database System.
			5.Describe different database architecture and analyses the use of appropriate architecture in real time environment.
			6.Use advanced database Programming concepts
310243	C303	Software Engineering & Project Management	1. Decide on a process model for a developing a software project
			2.Classify software applications and Identify unique features of various domains
			3. Design test cases of a software system.
			4.Understand basics of IT Project management.
			5.Plan, schedule and execute a project considering the risk management.
			6.Apply quality attributes in software development life cycle.

310244	C304	Information Systems & Engineering Economics	1.Understand the need, usage and importance of an Information System to an organization.
			2.Understand the activities that are undertaken while managing, designing, planning, implementation, and deployment of computerized information system in an organization.
			3.Further the student would be aware of various Information System solutions like ERP, CRM, Data warehouses and the issues in successful implementation of these technology solutions in any organizations
			4.Outline the past history, present position and expected performance of a company engaged in engineering practice or in the computer industry.
			5. Perform and evaluate present worth, future worth and annual worth analyses on one of more economic alternatives.
			6.Be able to carry out and evaluate benefit/cost, life cycle and breakeven analyses on one or more economic alternatives.
310245	C305	Computer Network (CN)	1. Analyze the requirements for a given organizational structure to select the most appropriate networking architecture, topologies, transmission mediums, and technologies
			2. Demonstrate design issues, flow control and error control
			3. Analyze data flow between TCP/IP model using Application, Transport and Network Layer Protocols.
			4.Illustrate applications of Computer Network capabilities, selection and usage for various sectors of user community.
			5.Illustrate Client-Server architectures and prototypes by the means of correct standards and technology.
			6.Demonstrate different routing and switching algorithms
310246	C306	Skill Development Lab	1. Evaluate problems and analyze data using current technologies in a wide variety of business and organizational contexts.
			2.Create data-driven web applications
			3.Incorporate best practices for building applications
			4. Employ Integrated Development Environment(IDE) for implementing and testing of software solution
			5. Construct software solutions by evaluating alternate architectural patterns.

310247	C307	Database Management System Lab	1.Develop the ability to handle databases of varying complexities
			2.Use advanced database Programming concepts
310248	C308	Computer Networks Lab	1.Demonstrate LAN and WAN protocol behavior using Modern Tools.
			2. Analyze data flow between peer to peer in an IP network using Application, Transport and Network Layer Protocols.
			3.Demonstrate basic configuration of switches and routers.
			4.Develop Client-Server architectures and prototypes by the means of correct standards and technology.
310249	C309	Audit Course 3	
	C310	AC3-I Cyber Security	1. Compare the interrelationships among security roles and responsibilities in a modern information-driven enterprise—to include interrelationships across security do mains (IT, physical, classification, personnel, and so on)
			2. Assess the role of strategy and policy in determining the success of information security;
			3.Estimate the possible consequences of misaligning enterprise strategy, security policy, and security plans;
	C311	AC3-II Professional Ethics and Etiquettes	1.understand the basic perception of profession, professional ethics, various moral issues & uses of ethical theories
			2.Understand various social issues, industrial standards, code of ethics and role of professional ethics in engineering field.
			3.Follow Ethics as an engineering professional and adopt good standards & norms of engineering practice.
			4.apply ethical principles to resolve situations that arise in their professional lives
	C312	AC3 - III Emotional Intelligence	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, managers

			5.Increase your leadership effectiveness by creating an atmosphere that engages others
			6.Apply EI behaviors and supports high performance
310250 SEM-II	**C315**	**Design & Analysis of Algorithms**	1.Formulate the problem
			2.Analyze the asymptotic performance of algorithms
			3.Decide and apply algorithmic strategies to solve given problem
			4.Find optimal solution by applying various methods
310251	C316	Systems Programming & Operating Systems (SP & OS)	1.Analyze and synthesize system software
			2.Use tools like LEX & YACC.
			3.Implement operating system functions.
310252	C317	Embedded Systems & Internet of Things (ES & IoT)	1.Implement an architectural design for IoT for specified requirement
			2.Solve the given societal challenge using IoT
			3.Choose between available technologies and devices for stated IoT challenge
310253	C318	Software Modeling and Design	1. Analyze the problem statement (SRS) and choose proper design technique for designing web- based/ desktop application
			2.Design and analyze an application using UML modeling as fundamental tool
			3.Apply design patterns to understand reusability in OO design
			4.Decide and apply appropriate modern tool for designing and modeling
			5.Decide and apply appropriate modern testing tool for testing web-based/desktop application
310254	C319	Web Technology	1.analyze given assignment to select sustainable web development and design methodology
			2.develop web based application using suitable client side and server side web technologies
			3.develop solution to complex problems using appropriate method, technologies, frameworks, web services and content management
310255	C320	Seminar & Technical Communication	1.be able to be familiar with basic technical writing concepts and terms, such as audience analysis, jargon, format, visuals, and presentation.

			2. be able to improve skills to read, understand, and interpret material on technology.
			3.improve communication and writing skills
310256	C321	Web Technology Lab	1.develop web based application using suitable client side and server side web technologies
			2.develop solution to complex problems using appropriate method, technologies, frameworks, web services and content management
310257	C322	System Programming & Operating System Lab	1. Understand the internals of language translators
			2.Handle tools like LEX & YACC.
			3.Understand the Operating System internals and functionalities with implementation point of view
310258	C323	Embedded Systems & Internet of Things Lab	1.Design the minimum system for sensor based application
			2.Solve the problems related to the primitive needs using IoT
			3.Develop full fledged IoT application for distributed environment
310259	C324	Audit Course 4	
	C325	AC4-I Digital and Social Media Marketing	1.Create editorial calendars to manage content distribution.
			2.Use Social Listening tools to create timely, relevant content.
			3.Create Social Media policies that combine business objectives with appropriate use of social media channels and content.
	C326	AC4-II Green Computing	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
	C327	AC4 -III Sustainable Energy Systems	1.Demonstrate an overview of the main sources of renewable energy.
			2.Understand benefits of renewable and sustainable energy systems.

COURSE	CODE	SUBJECT	Course Outcomes
	C328	AC4 -IV Leadership and Personality Development	1. Enhance holistic development of students and improve employability skills
BE Mechanical Engineering (2012 COURSE W.E.F.A.Y. 2015)
COURSE	CODE	SUBJECT	Course Outcomes
402041 SEM-I	C401	Refrigeration and Air Conditioning	1.Illustrate the fundamental principles and applications of refrigeration and air conditioning system.
			2.Obtain cooling capacity and coefficient of performance by conducting test on vapor compression refrigeration systems
			3.Present the properties, applications and environmental issues of different refrigerants
			4. Calculate cooling load for air conditioning systems used for various applications
			5.Operate and analyze the refrigeration and air conditioning systems.
402042	C402	CAD/ CAM Automation	1. Analyze and design real world components
			2.Suggest whether the given solid is safe for the load applied.
			3.Select suitable manufacturing method for complex components.
402043	C403	Dynamics of Machinery	1.Solutions to balancing problems of machines.
			2. Ability to understand the fundamentals of vibration and Noise.
			3.Ability to develop analytical competency in solving vibration problems.
			4. Ability to understand measurement and control of vibration and noise.
			5.Ability to calculate natural frequencies, Eigen values & Eigen vectors.
			6.Ability to measure vibrations, vibration characteristics and understand various methods for vibration control for real life problem.
402044	C404	Elective – I	
402044 A)	C405	Energy Audit Management	1.Carry out Energy Audit of the residence / society / college where they are studying.
			2.Carry out electrical tariff calculation and accurately predict the electricity bill required for the installation.

			3.Suggest various methods to reduce energy consumption of the equipment / office / premises.
402044 B)	C406	Tribology	1.For these simplified course contents, student develops confidence in him/her to fulfill course objectives.
			2. Term work includes simple case study/assignment/seminar/visit and in-semester theory examination as a part of learning process encourages students.
			3.He/she proves himself/herself to be excellent practical engineer in any tribological industry.
402044 C)	C407	Reliability Engineering	1. Understand and analyze different methods of failure.
			2.Calculate MTTF, MTBF, failure rate and hazard rate.
			3. Different probability methods applied to Reliability.
			4.Optimize Cost & reliability.
			5. Perform FEMA, FMECA, DOE, Taguchi method.
			6.Different methods to test reliability.
402044 D)	C408	Machine Tool Design	1.Design gear box.
			2. Design different machine tools considering static and dynamic loads.
			3.Understand effect of vibrations on life of machine tools.
			4.Understand design considerations for Special features in Machine tools.
402045	C409	Elective –II	
402045 A)	C410	Gas Turbine Propulsion	1.Demonstrate the gas turbine power plant
			2.Illustrate the jet propulsion system
			3.Analyze the performance of gas turbine engine
			4.Present the technical details of compressors used in gas power systems
402045 B)	C411	Product Design and Development	1.Design a sustainable product.
			2.Develop commercial Product
			3.Master in new techniques PLM and PDM
402045 C)	C412	Operation Research	1.Illustrate the need to optimally utilize the resources in various types of industries.
			2.Apply and analyze mathematical optimization functions to various applications.

			3.Demonstrate cost effective strategies in various applications in industry.
402045 D)	C413	Advanced Manufacturing Processes	1. Selection of appropriate manufacturing process for advance components
			2. Characterization of work pieces
402046	C414	Project –I	
402047 SEM-II	**C415**	**Power Plant Engineering**	1. Ability to have adequacy with Design, erection and development of energy conversion plants.
			2.Optimization of Energy Conversion plant with respect to the available resources.
			3.Scope of alternative erection of optimized, suitable plant at the location depending upon geographical conditions.
402048	C416	Mechanical System Design	1.The student will understand the difference between component level design and system level design.
			2. Ability to design various mechanical systems like pressure vessels, machine tool gear boxes, material handling systems, etc. for the specifications stated/formulated.
			3.Ability to learn optimum design principles and apply it to mechanical components.
			4.Ability to to handle system level projects from concept to product.
402049	C417	Elective-III	
402049 A)	C418	Refrigeration and Air Conditioning Equipment Design	1.Select the different components of refrigeration system i.e. condensers, evaporators, controls etc. for given applications
			2.Demonstrate the concepts of design of evaporators and condensers for unitary systems
			3.Analyses the performance of cooling tower and heap pipe.
			4.Illustrate the methods for production of ultralow temperature
402049 B)	C419	Robotics	1. Understand the complete design procedure of the robot.
			2. Select correct mechanism for operation of the robot.
			3. Select necessary actuators, sensors, control for satisfactory performance of the robot.
402049 C)	C420	Industrial Engineering	1.Apply the Industrial Engineering concept in the industrial environment.

			2.Manage and implement different concepts involved in methods study and understanding of work content in different situations.
			3. Undertake project work based on the course content.
			4.Describe different aspects of work system design and facilities design pertinent to manufacturing industries.
			5.Identify various cost accounting and financial management practices widely applied in industries.
			6. Develop capability in integrating knowledge of design along with other aspects of value addition in the conceptualization and manufacturing stage of various products.
402050	C421	Elective- IV	
402050 A)	C422	Computational Fluid Dynamics	1.Ability to analyze and model fluid flow and heat transfer problems.
			2.Ability to generate high quality grids and interpret the correctness of numerical results with physics.
			3.Ability to use a CFD tool effectively for practical problems and research.
			4.Ability to conceptualize the programming skills.
402050 B)	C423	Finite Element Analysis	1.Derive and use 1-D and 2-D element stiffness matrices and load vectors from various methods to solve for displacements and stresses
			2.Apply mechanics of materials and machine design topics to provide preliminary results used for testing the reasonableness of finite element results.
			3.Explain the inner workings of a finite element code for linear stress, displacement, temperature and modal analysis.
			4. Interpret the results of finite element analyses and make an assessment of the results in terms of modeling (physics assumptions) errors, discretization (mesh density and refinement toward convergence) errors, and numerical (round-off) errors.
402050 C)	C424	Design of Pumps, Blowers and Compressors	1.Select suitable Pump, Blower, fan or compressor for a given application.
			2.Design Pump, Blower, fan or compressor for a given application.
	BE Electrical Engineering (2012 COURSE W.E.F.A.Y. 2015)		

COURSE	CODE	SUBJECT	Course Outcomes
403141 SEM-I	**C401**	**Power System Operation and control**	1.Identify and analyze the dynamics of power system and suggest means to improve stability of system
			2.Suggest the appropriate method of reactive power generation and control
			3.Analyze the generation-load balance in real time operation and its effect on frequency and develop automatic control strategies with mathematical relations.
			4.Formulate objective functions for optimization tasks such as unit commitment and economic load dispatch and get solution using computational techniques.
403142	C402	PLC and SCADA Applications	1.Develop and explain the working of PLC with the help of a block diagram.
			2.Develop architecture of SCADA and explain the importance of SCADA in critical infrastructure.
			3. Execute, debug and test the programs developed for digital and analog operations.
			4.Reproduce block diagram representation on industrial applications using PLC and SCADA.
403143	C403	Elective- I	
403143 A)	C404	Special Purpose Machines	1.Reproduce principal of operation of PMSM, Stepper motor, SRM, Switch reluctance and linear motors.
			2.Develop torque speed and performance characteristics of above motors
			3.Enlist application of these motors
			4.Demonstrate various control strategies.
403143 B)	C405	Power Quality	1. Characterize power quality events.
			2. Reproduce causes of voltage sag and estimate magnitude of voltage sag.
			3.Carry out harmonic analysis and calculate total harmonic distortion.
			4. Calculate parameters for passive harmonic filter.
403143 C)	C406	Renewable Energy Systems	1.Write theory of sources like solar, wind and also experiments of same.
			2.Analyze operating conditions like stand alone and grid connected of renewable sources,

			3.Reproduce different Storage Systems, concept of Integration and Economics of Renewable Energy System
403143 D)	C407	Digital Signal Processing	1.Sample and reconstruct any analog signal.
			2.Find frequency response of LTI system
			3.Find Fourier Transform of discrete signals
			4.Design of IIR & FIR filter and implementation of them
403144	C408	Elective- II	
403144 A)	C409	Restructuring and Deregulation	1.Describe the process of restructuring of power system.
			2. Identify various operation of restructured power system
			3.Analyze Fundamental concept of congestion management.
			4.Analyze pricing and transmission rights of Electricity.
			5.Analyze various cost components in Generation, transmission, distribution sector and tariff
403144 B)	C410	Electromagnetic Fields	1.Interpret Electric and Magnetic Field with the help of associated laws.
			2.Solve electromagnetic problems with the help of mathematical tools
			3.Solve simple electrostatic and magnetic boundary conditions
			4.Analyze and solve electromagnetic problems using Maxwell's equations
403144 C)	C411	EHV AC Transmission	1.Highlight need for EHV ac transmission.
			2.Calculate line and ground parameters.
			3.Enlist problems encountered in EHV transmission.
			4.Express issues related to UHV transmission discussed.
403144 D)	C412	Introduction to Electrical Transportation Systems	1.Select between alternative modes for electric transportation system.
			2.Explain various types of energy storage devices and their impact on electrified transportation.
			3.Explain various power and energy converters in transportation system.

				4. Analyze different control systems used in electric vehicles.
				5.Describe different characteristics of electric car and elevators.
403145	C413	Control System II		1.Design and realize a compensator for a physical system,
				2.Represent a physical system in state space format and analyze the same and to realize a controller using state space technique.
				3.Analyze understand the various nonlinearities in a physical system.
				4.Realize digital control schemes.
403146	C414	Project		
403147 SEM-II	**C415**	**Switchgear and Protection**		1.Describe arc interruption methods in circuit breaker.
				2.Derive expression for restriking voltage and RRRV in circuit breaker
				3. Explain Construction, and working of different high voltage circuit breakers such as ABCB, SF6 CB, and VCB.
				4.Classify and Describe different type of relays such as over current relay, Reverse power relay, directional over current relay, Differential relay, Distance relay, Static relay and numerical relay
				5. Describe various protection schemes used for transformer, alternator and busbar
				6. Describe transmission line protection schemes.
403148	C416	Power Electronic Controlled Drivers		1.Analyze the operation of the converter, chopper fed dc drive.
				2.Analyze the operation of both classical and modern induction motor drives.
				3.Design the current and speed controllers for a closed loop solid-state d.c motor drive
				4.Select the drives for any particular application.
403149	C417	Electives III		
403149 A)	C418	High Voltage Engineering		1. Reproduce concepts in breadth with various concepts of breakdown phenomenon of solid, liquid and gaseous materials along with various causes of overvoltage and protection from them.
				2. List and reproduce various methods of generation and measurement of DC, AC and impulse high voltage
				3.Demonstrate an ability to carry various DC. AC and impulse testing on high voltage equipments and materials.

			4. Apply safety measures, earthing, shielding for layout of HV apparatus required in High voltage laboratory.
403149 B)	C419	HVDC and FACTS	1. Analyze modeling of FACTs Controllers.
			2.Simulate various controllers and HVDC systems using softwares such as PSCAD and MATLAB.
			3.Develop computer programs for power flow studies.
403149 C)	C420	Digital Control Systems	1. Differentiate between various control systems.
			2. Analyze digital control system and its stability.
			3. Elaborate applications such as digital temperature control and position control.
			4. Simulate digital control system by using computer software.
403149 D)	C421	Intelligent Systems and its Applications in Electrical Engineering	1.Compare various AI tools.
			2.Develop algorithms for AI tools
			3.Apply AI tools for Applications in electrical engineering
403150	C422	Electives IV	
403150 A)	C423	Smart Grid	1.Differentiate Conventional and Smart Grid.
			2.Identify the need of Smart Grid, Micro Grid, Smart metering, Smart storage, Hybrid Vehicles, Home Automation, Smart Communication.
			3. Get introduced to new upcoming concepts in electrical from Utility to Consumers.
			4.Comparing and getting acquainted with emerging technologies and current professional issues in electric Grid.
			5.Express the necessity of global smart communication system
403150 B)	C424	Robotics and Automation	1.Differentiate between types of robots based on configuration, method of control, types of drives, sensors used etc.
			2.Choose a specific robot for specific application with given specifications.
			3.Analyze the robot arm dynamics for calculation of torques and forces required for different joints of robots for control of robot arm.

COURSE	CODE	SUBJECT	Course Outcomes
			4.Determine the D-H parameters for a robot configuration using concepts from robot arm kinematics which further leads to forward/inverse kinematics.
			5.Calculate the Jacobian matrix for robot arm velocity and decide the singular positions.
403150 C)	C425	Illumination Engineering	1. Define and reproduce various terms in illumination.
			2. Identify various parameters for illumination system design.
			3. Design indoor and outdoor lighting systems.
			4. Enlist state of the art illumination systems.
403150 D)	C426	Open Elective : VLSI Design	1. Design and develop combinational and sequential digital logic circuits using different techniques.
			2. Analyze and design basic central processing units and memory systems for general-purpose computers
			3. Use appropriate techniques and modern digital-systems development tools for Digital circuits.
			4.Model digital circuit with HDL and simulate
403146	C427	Project	1. Work in team and ensure satisfactory completion of project in all respect.
			2. Handle different tools to complete the given task and to acquire specified knowledge in area of interest.
			3. Provide solution to the current issues faced by the society.
			4. Practice moral and ethical value while completing the given task.
			5. Communicate effectively findings in verbal and written forms.
	BE E& TC (2012 COURSE W.E.F.A.Y. 2015)		
COURSE	**CODE**	**SUBJECT**	Course Outcomes
404181 SEM-I	**C401**	**VLSI Design & Technology**	1.Model digital circuit with HDL, simulate, synthesis and prototype in PLDs.
			2.Understand chip level issues and need of testability.
			3.Design analog & digital CMOS circuits for specified applications.
404182	C402	Computer Networks	1. Understand fundamental underlying principles of computer networking.

			2.Describe and analyze the hardware, software, components of a network and the interrelations.
			3. Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies;
			4.Have a basic knowledge of the use of cryptography and network security;
			5. Have a basic knowledge of installing and configuring networking applications.
			6.Specify and identify deficiencies in existing protocols, and then go onto select new and better protocols.
404183	C403	Microwave Engineering	1.Formulate the wave equation in wave guide for analysis.
			2.Identify the use of microwave components and devices in microwave applications.
			3.Understand the working principles of all the microwave tubes
			4.Understand the working principles of all the solid state devices
			5.Choose a suitable microwave tube and solid state device for a particular application
			6..Carry out the microwave network analysis
			7.Choose a suitable microwave measurement instruments and carry out the required measurements.
404184	C404	Elective I	
404184 1)	C405	Digital Image Processing	1.Develop and implement algorithms for digital image processing.
			2.Apply image processing algorithms for practical object recognition applications.
404184 2)	C406	Embedded Systems & RTOS	1.Get insight of design metrics of Embedded systems to design real time applications to match recent trends in technology.
			2.Understand Real time systems concepts.
			3.Understand Linux operating system and device drivers.
			4.Get to know the hardware – software co design issues and testing methodology for Embedded system
404184 3)	C407	Software Defined Radio	1.Compare SDR with traditional Hardware Radio HDR.

			2.Implement modern wireless system based on OFDM, MIMO & Smart Antenna
			3.Build experiment with real wireless waveform and applications, accessing both PHY and MAC, Compare SDR versus MATLAB and Hardware Radio
			4.Work on open projects and explore their capability to build their own communication system.
404184 4)	C408	Industrial Drives and Control	1.Understand the basic principles of power electronics in drives and its control, types of drives and basic requirements placed by mechanical systems on electric drives.
			2.Understand the operation of 1ϕ & 3ϕ converter drives for separately excited & series DC motors, dual converter drives, 2 quadrant and 4 quadrant DC chopper drives, Open-loop & closed-loop control of DC drives with transfer function, Dynamic and regenerative braking. Protection circuits for DC drives.
			3.Learn speed control of induction motor drives in an energy efficient manner using power electronics. To study and understand the operation of both classical and modern induction motor drives.
			4. Learn and understand working of cylindrical-rotor motor, salient-pole motor, reluctance motor, and permanent-magnet motors.
			5.Learn closed loop V/f control and load-commutated inverter (LCI) control. Variable reluctance & permanent magnet stepper motors & drives, switched reluctance motors & drives, brushless DC and AC motors & drives.
404185	C409	Elective II	
404185 1)	C410	Multi rate & Adaptive Signal Processing	1. The student will use theory of multirate processing for design of basic systems.
			2. The student will be able to performmultiresolutionanalysis using Haar wavelet.
			3. The student will show skills for design of adaptive filter for Wiener filter.
404185 2)	C411	Electronic Product Design	1.Understand various stages of hardware, software and PCB design.
			2.Importance of product test & test specifications.
			3.Special design considerations and importance of documentation.

404185 3)	C412	PLCs and Automation	1.Ability to recognize industrial control problems suitable for PLC control
			2.An over view of technology of advanced topics such as SCADA, DCS Systems, Digital Controller, CNC Machines
			3.The ability to select the essential elements and practices needed to develop and implement the Engineering Automation using PLC approach.
404185 4)	C413	Artificial Intelligence	1.Design and implement key components of intelligent agents and expert systems.
			2. To apply knowledge representation techniques and problem solving strategies to common AI applications.
			3.Applyand integrate various artificial intelligence techniques in intelligent system development as well as understand the importance of maintaining intelligent systems.
			4.Build rule-based and other knowledge-intensive problem solvers.
404189 SEM-II	**C417**	**Mobile Communication**	1.Explain and apply the concepts telecommunication switching, traffic and networks
			2.Analyze the telecommunication traffic.
			3. Analyze radio channel and cellular capacity.
			4.Explain and apply concepts of GSM and CDMA system.
404190	C418	Broadband Communication Systems	1. Carry out Link power budget and Rise Time Budget by proper selection of components and check its viability.
			2.Carry out Satellite Link design for Up Link and Down Link.
404191	C419	Elective III	
404191 1)	C420	Speech & Audio Signal Processing	1. Design and implement algorithms for processing speech and audio signals considering the properties of acoustic signals and human hearing.
			2. Analyze speech signal to extract the characteristic of vocal tract (formants) and vocal cords (pitch).
			3.Write a program for extracting LPC Parameters using Levinson Durbin algorithm
			4.Formulate and design a system for speech recognition and speaker recognition

404191 2)	C421	RF Circuit Design	1. Understand behavior of passive components at high frequency and modeling of HF circuit.
			2. Design HF amplifiers with gain bandwidth parameters.
			3. Understand Mixer types and characteristics.
			4. Gain the knowledge about PLLs and Oscillators with respect to their circuit topologies.
404191 3)	C422	Audio Video Engineering	1.To study the analysis and synthesis of TV Pictures, Composite Video Signal, Receiver, Picture Tubes and Television Camera Tubes.
			2.To study the various Colour Television systems with a greater emphasis on television standards.
			3. To study the advanced topics in Digital Television and High Definition Television.
			4. To study audio recording systems such CD/DVD recording, Audio Standards, and Acoustics principles.
404191 4)	C423	Soft Computing	1.use a new tool /tools to solve a wide variety of real world problems
			2. find an alternate solution , which may offer more adaptability, resilience and optimization
			3. Identify the suitable antenna for a given communication system
			4.Gain knowledge of soft computing domain which opens up a whole new career option
			5.Tackle real world research problems
404192	C424	Elective IV	
404192 1)	C425	Biomedical Signal Processing	1. The student will be able to model a biomedical system.
			2.The student will be able to understand various methods of acquiring bio signals.
			3.The student will be able to understand various sources of bio signal distortions and its remedial techniques.
			4.The students will be able to analyze ECG and EEG signal with characteristic feature points.

COURSE	CODE	SUBJECT	Course Outcomes
			5. The student will have a basic understanding of diagnosing bio-signals and classifying them.
404192 2)	C426	Nano Electronics & MEMS	1. Gain knowledge of Nano electronics material, and manufacturing of Nano devices.
			2. Be introduced to MEMS and its sensors and actuators.
			3.Understand various measuring methods and tools.
404192 3)	C427	Detection & Estimation Theory	1. Apply suitable hypothesis testing criteria for signal detection problems.
			2.Use parameter estimation in signal processing and communication problems.
			3. Design a estimator and detector.
404192 4)	C428	Wireless Networks	1. Keep himself updated on latest wireless technologies and trends in the communication field
			2.Understand the transmission of voice and data through various networks.
	BE Information Technology (2012 COURSE W.E.F.A.Y. 2015)		
COURSE	**CODE**	**SUBJECT**	**Course Outcomes**
414453 SEM-I	**C401**	**Information and Cyber Security**	1.Students shall be able to understand what are the common threats faced today
			2.What is the foundational theory behind information security
			3.What are the basic principles and techniques when designing a secure system
			4.How today's attacks and defenses work in practice
			5.How to assess threats for their significance and
			6.How to gauge the protections and limitations provided by today's technology
414454	C402	Software Modeling and Design	1. understand the usage of various UML diagrams to build a model
			2. prepare an object oriented model in business domain of an application.
			3. prepare an object oriented model in solution domain.
			4. apply object oriented principles in the design of software system.
			5. get started on study of GOF design patterns.

			6. understand different types of software testing.
414455	C403	Machine Learning	1. Students will be able to model the learning primitives.
			2. Students will be able to build the learning model.
			3. Student will be able to tackle real world problems in the domain of Data Mining, Information Retrieval, Computer vision, Linguistics and Bioinformatics.
414456	C404	Elective – I	
414456 A	C405	Soft Computing	1. Students will be inspired to solve complex real-world problems.
			2. Students will correlate human-like processing in problem solving with current technologies in various domains like Bio Informatics, Multimedia Systems, Big Data Analytics, etc.
			3. Student will be able to tackle problems of interdisciplinary nature.
414456 B	C406	Usability Engineering	1. Justify the need to study human-computer-interaction or human-factors while designing software.
			2. Discuss the process of designing user-friendly software based on usability engineering guidelines.
			3. Apply interaction design and UI design process in enhancing user-experience of an application.
			4. Conduct usability evaluation of user-interfaces or software applications.
			5. Discuss industry standards for designing and evaluating user-interfaces.
			6. Discuss current trends in usability engineering
414456 C	C407	Modern Compilers	1. Understand the performance characteristics of modern processors
			2. Be familiar with compiler architecture and implementation.
			3. Be familiar with register allocation.
			4. Be exposed to compiler optimization.
414456 D	C408	Parallel Algorithms and Design	1. Explain key concepts in parallel computational models.
			2. Describe parallel algorithms, architectures and applications.
			3. Implement different parallel algorithms, techniques and architectures.
			4. Explain graph algorithms.
			5. Understand dynamic programming strategy and its applications.
414456 E	C409	Cloud Computing	1. Understand and Familiar with the basic concepts of cloud computing.
			2. Understand how to build large scale distributed systems and cloud applications.

			3. Comprehend the importance of cloud security.
			4. Understand Ubiquitous Computing and applications.
414457	C410	Elective – II	
414457 A	C411	Business Intelligence	1. Design and implement OLTP, OLAP and Warehouse concepts.
			2. Design and develop Data Warehouse using Various Schemas & Dimensional modelling.
			3. Use the ETL concepts, tools and techniques to perform Extraction, Transformation, and Loading of data.
			4. Report the usable data by using various reporting concepts, techniques/tools, and use charts, tables for reporting in BI.
			5. Use Analytics concepts like data mining, Exploratory and statistical techniques for predictive analysis in Business Intelligence.
			6. Demonstrate application of concepts in BI.
414457 B	C412	Service Oriented Architecture	1. Students will be able to know the importance of SOA.
			2. Students will be able to know SOA primitives.
			3. Students will be able to analyze quality web services.
			4. Students will be able to design and develop web services.
414457 C	C413	E&M Governance	1. Explain what E & M Governance is.
			2. Understand the consequences of E-Commerce and M-Commerce.
			3. Describe E-Procurements and E-Business Networks.
			4. Define E-Commerce and M-Commerce services for consumers and businesses.
			5. Understand E & M Governance standards and service development technology in M- Commerce.
414457 D	C414	Geo Informatics Systems	1. Students will understand basics of Remote Sensing & GIS.
			2. Students will able to analyze GIS data and GIS applications.
414457 E	C415	Natural Language Processing	1. Automatic processing and information extraction of human language using computer.
			2. Learn applications of Natural Language Processing such as Information extraction, semantic web search, machine translation, text summarization, spam detection.

414458	C416	Software Laboratory - III	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.
414459	C417	Software Laboratory - IV	1. Students will be able to identify classes and collaboration from requirements.
			2. Students will be able to prepare analysis and design model and implement.
			3. Students will be able to use the test driven development approach in implementation.
			4. Students will be able to experience Object Oriented Software Development life cycle activities.
414460	C418	Project Phase I	At the end of this course the student should be able to show preparedness to study independently in chosen domain of Information Technology and programming languages and apply to variety of real time problem scenarios.
414461 SEM-II	**C419**	**Distributed System**	1. Understand the principles and desired properties of distributed systems on which the internet and other distributed systems are based.
			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. Identify the challenges in developing distributed applications.
414462	C420	Advanced Databases	1. Understanding of Advances in Database Architectures for Big data.
			2. Master the basics of web and object oriented database using XML and JDOQL.
			3. Master the basic concepts of NoSQL Databases.
			4. Understand how analytics and big data affect various functions now and in the future.
			5. Appreciate the impact of analytics and big data on the information industry and the external ecosystem for analytical and data services.
			6. Understanding of current trends in databases.
414463	C421	Elective – III	
414463 A	C422	Mobile Computing	1. Students will gain knowledge of GSM architecture.
			2. Students will be able to understand mobility management.
			3. Students will be able to understand working of wireless architectures and their applications.
			4. Students will be able to understand recent trends and emerging technologies.

414463 B	C423	Advanced Graphics and Animation	1. Provide solid grounding in three dimensional modeling mechanisms.
			2. Introduce students to techniques in virtual reality, solid modeling and animation
			3. To gain first-hand experience for accurate modeling, rendering, and simulation, and the necessary data structures and algorithms.
			4. To develop programming skills in 3D computer graphics.
			5. Become acquainted with some advanced topics in computer graphics.
414463 C	C424	Information Storage and Retrieval	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. Student should be able to understand importance of recommender system.
			5. Student should be able to understand concept of multimedia and distributed information retrieval.
414463 D	C425	IT Enabled Services	1. Students will be able to understand the process of IT Industry
			2. Students will be able to understand Indian laws of IT industry
			3. Student will be able to study current trends and services in IT industry
			4. Student will be able to understand programming concept of IT Web services.
414463 E	C426	Advanced Computer Networks	1. Apply basic principles in designing modern computer networks.
			2. Use functionality of high speed networks in development of advanced network applications.
			3. Use advanced routing architecture and protocols in networking.
			4. Apply performance measures for routing in computer networks.
			5. Use advanced wireless standards in designing wireless networks.
414464	C427	Elective – IV	
414464 A	C428	Bio Informatics	1. Understand basic DNA and RNA structure, features and classification schema for databases, applications in Bioinformatics.
			2. Use various statistical concepts and visualization tools to discover new patterns in Protein Structures and analyze randomness in data.

			3. Explore the various Bioinformatics Databases for knowledge discovery given by Data Mining and Pattern Matching techniques through study of various sequence alignment algorithms.
			4. Offer appropriate solutions for similarity search through similarity search and prediction algorithms.
			5. Understand modeling and simulation in bioinformatics with the help of simulation and statistical protocols, basic drug discovery process.
			6. Gain awareness in field of Systems Biology and Human Disease.
414464 B	C429	Real Time and Embedded Systems	1. Students should be able to design distributed embedded system for specific example.
			2. Students should be able to schedule real time tasks as per the specific requirement.
414464 C	C430	Green IT - Principles and Practices	1. Students will be able to create awareness among stakeholders and promote green agenda and green initiatives in their working environments leading to green movement.
			2. This green movement will create new career opportunities for IT professionals, auditors and others with special skills such as energy efficiency, ethical IT assets disposal, carbon footprint estimation, reporting and development of green products, applications and services.
414464 D	C431	Internet of Things	1. Explain what Internet of Thins is.
			2. Describe key technologies in Internet of Things.
			3. Understand wireless sensor network architecture and its framework along with WSN applications.
			4. Explain resource management in the Internet of Things.
			5. Understand business models for the Internet of Things.
414464 E	C432	Open Elective	
414465	C433	Software Laboratory - V	1. Understand the principles on which the internet and other distributed systems are based.
			2. Understand and apply the basic theoretical concepts and algorithms of distributed systems in problem solving.
414466	C434	Software Laboratory - VI	1. Understanding of Advanced Database Programming Languages.
			2. Master the basics of web and object oriented database languages and construct queries using XML and JDOQL.
			3. Master the basic concepts of NoSQL Databases.

COURSE	CODE	SUBJECT	Course Outcomes
			4. Understand how analytics and big data affect various functions now and in the future.
			5. Appreciate the impact of analytics and big data on the information industry and the external ecosystem for analytical and data services.

<p style="text-align:center;background:yellow;color:red;font-weight:bold;">BE Computer Engineering(2012 COURSE W.E.F.A.Y. 2015)</p>

COURSE	CODE	SUBJECT	Course Outcomes
410441 SEM-I	**C401**	**Design & Analysis of Algorithms**	1.To survey algorithmic strategies give presentations using open source documentation tools like Latex and soft skill methodologies.
			2. To write mathematical modeling of algorithms for problem solving.
			3.To develop SRS in the UG projects;
			4.To solve problems for multi-core or distributed or concurrent/Parallel/Embedded environments;
410442	C402	Principles of Modern Compiler Design	1.To write symbol tables, different types of grammars to solve problem of parsing.
			2.To design and write simple compiler using FOSS tools.
			3.To practice compiler tools in basic, concurrent, distributed and embedded environments.
			4.To survey and use latest trends and advances in compilers
410443	C403	Smart System Design and Applications	1.To write and survey solution for multidisciplinary case-study using mathematical modeling give presen- tations using soft skills methodologies;
			2. To write and survey embedded systems applications using machine learning;
			3. To solve problems for multi-core or distributed, concurrent and embedded environments;
410444	C404	Elective-I	
410444 1)	C405	Image Processing	1.To survey image processing techniques, FOSS tools and related mathematics.
			2.To write image processing programs with applying concepts using open source tools;
			3. To solve Image Processing problems using multi-core or distributed, concurrent/Parallel environments.
410444 2)	C406	Computer Network Design and Modeling	1.To design, model and analyze computer network.
			2.To practice using FOSS tools for network design, modeling and analysis.
			3. To solve problems for multi-core or distributed, concurrent/Parallel environments.

		Advanced Computer	
410444 3)	C407	Programming	1.To present a survey on building blocks of advance programming tools.
			2.To practice programming problems using advance open source programming tools.
			3.To solve problems for multi-core or distributed, concurrent/Parallel environments.
		Data Mining Techniques	
410444 4)	C408	and Applications	1. To present survey on different learning, classification and data mining foundations.
			2.To write programs and methods for data Mining applications.
			3.To solve problems for multi-core or distributed, concurrent/Parallel environments
410445	C409	Elective-II	
		Problem Solving with	
410445 1)	C410	Gamification	1.To write survey on the gamification paradigms.
			2.To write programs to solve problems using gamification and open source tools.
			3.To solve problems for multi-core or distributed, concurrent/Parallel environments
410445 2)	C411	Pervasive Computing	1. To present a survey on pervasive computing building blocks.
			2. To create presentations using pervasive computing techniques and devices.
			3.To solve problems for multi-core or distributed, concurrent/Parallel environments.
410445 3)	C412	Embedded Security	1. To write a survey on the embedded security concepts and technologies.
			2.To write programs using open source embedded technologies.
			3.To create presentation for solving Embedded Security problems
410445 4)	C413	Multidisciplinary NLP	1.To present a survey on NLP and Machine learning paradigms.
			2. to write programs using NLP open source tools.
			3.To create presentation for applying NLP for multi-core or distributed, concurrent/Parallel environments.
410446	C414	Computer laboratory-I	1.To write efficient mathematical design, analysis and testing of algorithmic assignments.
			2. To debug and demonstrate the Testing of functioning using Software Engineering for OO-programming.
			3.To write programs using advanced FOSS tools and technologies
			4.To write test case using multi-core or distributed, concurrent/Parallel environments.
410447	C415	Computer Laboratory-II	1. To write mathematical modeling for problem solving.
			2.To write programs for smart devices using FOSS Tools.

			3.To write Programs for gamifications.
			4.To write test cases to solve problems for pervasiveness,embedded security and NLP applications.
			5.To write test cases for multi-core or distributed, concurrent/Parallel environments
410448	C416	Project	1.To write problem solutions in projects using mathematical modeling, using FOSS programming tools and devices or commercial tools;
			2.To write SRS and other software engineering documents in the project report using mathematical models developed and NP-Hard analysis;
			3.To write test cases using multi-core, distributed, embedded, concurrent/Parallel environments;
			4.To write a conference paper;
			5.To practice presentation, communication and team-work skills.
410449 SEM-II	**C417**	**Software Design Methodologies & Testing**	1.To present a survey on design techniques for software system
			2.To present a design and model using UML for a given software system
			3.To present a design of test cases and implement automated testing for client server, Distributed, mobile applications
410450	C418	High Performance Computing	1.To transform algorithms in the computational area to efficient programming code for modern computer architectures
			2. To write, organize and handle programs for scientific computations
			3. To create presentation of using tools for performance optimization and debugging
			4.To present analysis of code with respect to performance and suggest and implement performance im- provements
			5.To present test cases to solve problems for multi-core or distributed, concurrent/Parallel environments
410451	C419	Elective-III	
410451 1)	C420	Mobile Computing	1.To write a survey on Mobile Computing Building Blocks.
			2.To write a presentation on survey FOSS tools and Technologies.
			3. To write test cases to solve problems using Mobile Computing algorithms.
410451 2)	C421	Web Technology	1.To present a survey on building blocks of Web Technologies and open source tools.
			2. To write presentations on using Web Technologies with case studies.

			3. To write test cases to use technologies for solving problems using Web Technologies.
410451 3)	C422	Cloud Computing	1.To install cloud computing environments.
			2.To present a survey on cloud building blocks and technologies.
			3.To perform cloud computing admin and programming using open source tools.
410451 4)	C423	Cyber Security	1. To write a survey on cyber security concepts.
			2. To create a case study report on practice administrating using Cyber Security open source tools.
			3. To write problem solutions for multi-core or distributed, concurrent/Parallel environments.
410452	C424	Elective-IV Open Elective	
410452 1)	C425	Business Analytic and Intelligence	1.To write case studies in Business Analytic and Intelligence using mathematical models.
			2. To present a survey on applications for Business Analytic and Intelligence.
			3.To write problem solutions for multi-core or distributed, concurrent/Parallel environments
410452 2)	C426	Operations Research for Algorithms in Scientific Applications	1. To write a presentation on mathematical Concepts applied in Operations Research.
			2. To write a survey on applications of Operations Research.
			3.To write case studies for solving problems using multi-core or distributed, concurrent/Parallel environ- ments
410452 3)	C427	Mobile Applications	1.To write a survey on tools and architectures for Mobile Applications.
			2.To write using mathematical models the problem solutions using Mobile Applications.
			3.To write develop mobile applications using open source tools.
410452 4)	C428	Open Elective	1.To write a presentation for solving problem of Inter-disciplinary challenges using mathematical modeling.
			2.To write case studies to apply algorithmic skills for computing Applications.
			3.To write a problem solutions for multi-core or distributed, concurrent/Parallel environments
410453	C429	Computer laboratory-III	1. To write problem solutions using mathematical modeling.
			2. To write reports of application of software design methods and testing.
			3.To write programs using FOSS tools.
			4. To write problem solutions using multi-core or distributed, concurrent/Parallel environments
410454	C430	Computer laboratory-IV	1. To write programs to develop applications using BIA Technologies using mathematical modeling.

			2.To write programs using OR and Mobile Programming Technologies using mathematical modeling.
			3. To write programs using FOSS tools and devices.
			4.To write problem solutions using multi-core or distributed, concurrent/Parallel environments
410455	C431	Project	1.To write review SRS, reliability testing reports, and other software engineering documents in the project report;
			2.To write problem solution using multi-core, distributed, embedded, concurrent/Parallel environments;
			3.To write the test cases to demonstrate the results of the project;
			4.To write conference paper;
			5.To write code using FOSS tools and technologies or propitiatory Tools as per requirements;
			6.To practice presentation, communication and team-work skills.