S V COLLEGE OF ENGINEERING
(AUTONOMOUS)
Karakambadi Road, Tirupati - 517507
Branch: Civil Engineering

PROGRAM OUTCOMES (POs)
Engineering Graduates will be able to:

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 analyze 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.

PROGRAM SPECIFIC OUTCOMES (PSOs)

A graduate of the Computer Science and Engineering Program will be able to:

PSO1:	Graduates can analyze the Civil Engineering problems by applying the knowledge of basic sciences, engineering skills, mathematics and computational tools.
PSO2:	Graduates shall demonstrate sound knowledge in planning, analysis, design, laboratory investigations, cost estimations and construction aspects of all kinds of civil engineering

HEAD
DEPARTMENT OF CIVIL ENG.
S.V. COLLEGE OF ENGINEERING
KARAKAMBADI ROAD, TIRUPATI-517 507

Department of Electrical and Electronics Engineering

Program Specific Outcome (PSOs)

PSO 1: Design and develop innovative projects using the domain knowledge of control systems, power electronics, electrical machines, microprocessors and microcontrollers.

PSO 2: Learn the constantly varying technological developments in their problem solving process.

Program Outcome (POs)

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineeringsciences.
3. **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.
4. **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 validconclusions.
5. **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 thelimitations.
6. **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 engineeringpractice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainabledevelopment.

Department of Electrical and Electronics Engineering

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineeringpractice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinarysettings.

10. **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.

11. **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 environment.

12. **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 technologicalchange.

HOD EEE
H.O.D. E.E.E.
S.V. COLL[illegible] ENGINEERING
KARAKAMBADI ROAD, TIRUPATI-517 507.

SRI VENKATESWARA COLLEGE OF ENGINEERING
(Autonomous)
Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507.
Accredited by NBA (B.Tech – CSE, ECE,EEE,Mech.,Civil and IT) & NAAC with 'A' Grade
Approved by AICTE, New Delhi permanently affiliated to JNTUA, Ananthapuram.

Department of Electrical and Electronics Engineering

I YEAR- I SEMESTER

SRI VENKATESWARA COLLEGE OF ENGINEERING
(Autonomous)

B.Tech-R20Regulations

ELECTRICAL&ELECTRONICSENGINEERING

IB.Tech.–ISemester

S.NO	Subject Code	Course	COs	COURSE OUTCOMES
1	MA20ABS 101	LinearAlgebraandCalculus	C111.1	**Apply** Solve the system of linear equations and reduce the quadratic forms to canonical form by applying matrices.
			C111.2	**Apply** mean value theorems for different functions with different intervals.
			C111.3	**Analyze** the multivariable calculus to find Jacobean, Maximum and Minimum.
			C111.4	**Apply** multiple integrals to find the area and volume for different functions.
			C111.5	**Analyze**the concepts of Beta and Gamma special functions for different functions.
2	PH20ABS 103	AppliedPhysics	C112.1	**Analyze**the phenomena of interference, diffraction and polarization and its applications
			C112.2	**Analyze**the significant properties and applications of both dielectric and magnetic materials in the emerging micro devices.
			C112.3	**Apply t**he basic knowledge of electromagnetic waves and fiber optics to the engineering applications.
			C112.4	**Analyze** knowledge of semiconductors through the description and analysis of processes in various engineering

Department of Electrical and Electronics Engineering

				applications.
			C112.5	**Apply** the fundamental aspects of Superconductivity and Nanotechnology to solve problems in our daily life.
3	**EG20AHS 101**	**CommunicativeEnglish**	**C113.1**	**Facilitate** effective listening skills for better comprehension of academic lectures and English spoken by native speakers
			C113.2	**Focus** on appropriate reading strategies for comprehension of various academic texts and authentic materials
			C113.3	Help improve speaking skills through participation in activities such as role plays,discussions and structured talks/oral presentations
			C113.4	**Impart** effective strategies for good writing and demonstrate the same in summarizing, writing well-organized essays, record and report useful information
			C113.5	**Provide** knowledge of grammatical structures and vocabulary and encourage their appropriate use in speech and writing
4	**EE20AES 103**	**FundamentalsofElectricalCircuits**	**C114.1**	**Analyze**the concept of electrical circuit basic concepts, reduction techniques and magnetic circiuts behaviour.
			C114.2	**Examine** the various factors for given alternating waveform and analysis of ac circuits.
			C114.3	**Analyze** three phase balanced and unbalanced circuits and determine line voltages, line currents, phase voltages and phase currents
			C114.4	**Apply** the behaviour given network with the help of theorems

Department of Electrical and Electronics Engineering

			C114.5	**Analysis** of electrical networks by graph theory, duality and dual networks.
5	**ME20AES102**	**EngineeringDrawing**	**C115.1**	**Draw**basicgeometricalconstructions,curvesusedinengineeringpractices.
			C115.2	**Understand**theconceptofprojectionandacquirevisualizationskills,projectionofpoints,Lines andPlanes.
			C115.3	**Illustrate**theprojectionsofsolidsgraphically.
			C115.4	**Draw**andexplorethesectionalviewsofrightregularsolids.
			C115.5	**Draw**thedevelopmentofsurfacesofsolids.
6	**ME20AES103**	**EngineeringGraphics Lab**	**C116.1**	**Draw** various curves applied in engineering
			C116.2	**Show** projections of solids and sections graphically
			C116.3	**Draw** the development of surfaces of solids
			C116.4	**Use** computers as a drafting tool
			C116.5	**Draw** isometric and orthographic drawings using CAD packages.
7	**PH20ABS104**	**APPLIEDPHYSICSLAB**	**C117.1**	**Apply** skill to find the wavelength of spectral lines using plane diffraction grating.
			C117.2	**Analyze** the usage of electrical and optical systems for various measurements.
			C117.3	**Apply** the concept of hysteresis curve of a ferromagnetic material to know the strength of magnetic material.

Department of Electrical and Electronics Engineering

			C117.4	**Analyze** the working principles of semiconducting devices to study the applications of semiconducting technology.
			C117.5	**Differentiate** the patterns of spectrums using interference and diffraction phenomena.
8	**EG20AHS102**	**CommunicativeEnglishLab**	**C118.1**	**Remember** the different aspects of the English language proficiency with emphasis on LSRW skills
			C118.2	**Apply** communication skills through various language learning activities
			C118.3	**Analyze** the English speech sounds, stress, rhythm, intonation and syllable division.
			C118.4	**Evaluate** acceptable etiquette essential in social and professional settings
9	**EE20AES104**	**FundamentalsofElectricalCircuitsLab**	**C119.1**	**Apply** suitable theorems for circuit analysis and verify the results theoretically
			C119.2	**Determine** the Self, Mutual Inductances and Coefficient of Coupling
			C119.3	**Calculate** the active power experimentally for the given network and verify thetheoretical values
			C119.4	**Evaluate** the reactive power experimentally for the given network and verify the theoretical values
			C119.5	**Understand** the concept of star and delta-connected loads
10	**MA20AMC101**	**LogicalSkillsforProfessionals-I**	**C11A.1**	**Demonstrate**knowledgebasicmathematicstodevelopanalyticalskillstosolvingproblemsofAverages-Percentages-Ratio.
			C11A.2	**Demonstrate** knowledge basic mathematics to develop analytical

Department of Electrical and Electronics Engineering

				skills tosolvingproblemsofPartnership-SimpleInterestandCompoundInterestandtimeandstance.
			C11A.3	**Demonstrate** knowledge basic mathematics to develop analytical skills tosolvingproblemsoftimeadwork,problemsontrainsandBoatsandstreams.
			C11A.4	**Analyze**thetechniquesinseries,codinganddecodingandbloodrelations
			C11A.5	**Analyze**thetechniquesindirections,problemsonagesandanalogy.

I YEAR- II SEMESTER

SRI VENKATESWARA COLLEGE OF ENGINEERING
(Autonomous)

B.Tech-R20Regulations

ELECTRICAL&ELECTRONICSENGINEERING

IB.Tech.–IISemester

S.NO	Subject Code	Course	COs	COURSE OUTCOMES
1	MA20ABS201	DIFFERENTIAL EQUATIONSAN DVECTORCALC ULUS	C121.1	**Classify** the different methods of first or Differential equations to solve engineeri
			C121.2	**Analyze** the different methods of higher order Differential equations to solve engineering problems.
			C121.3	**Classify** the different methods of first order Partial Differential equations to solve engineering problems.
			C121.4	**Illustrate** the physical interpretation of

Department of Electrical and Electronics Engineering

				Gradient, Divergence and Curl
			C121.5	**Apply** Green's, Stokes and Divergence theorem in evaluation of double and triple integrals
2	**CH20ABS103**	**CHEMISTRY**	**C122.1**	**Determine** the energy of the electron in a molecule as well as its geometry by using molecular orbital theory and Crystal field theory.
			C122.2	**Apply** the basic concepts of electro analytical techniques that facilitate rapid and reliable measurements.
			C122.3	**Distinguish** polymerization reactions with mechanisms and their applications.
			C122.4	Use the principle of instrumentation to **analyze**the chemical and biological components.
			C122.5	**Compare** the different molecular assemblies,molecular switches and molecular devices
3	**CS20AES101**	**ProblemSolving usingC**	**C123.1**	**Evaluate** a computer-based system, process, components and Analyze problems by designing algorithms and flow chart
			C123.2	**Apply** logical skills to implement sloutions to slove computational problems
			C123.3	**Choose** appropriate control structure depending on the problem to be solved and divide complex problems into modules
			C123.4	**Apply** arrays to organize data to slove complex problems and effectively use memory with pointers
			C123.5	**Apply** structures to organize heterogenous data to slove real world problems and select appropriate sorting

Department of Electrical and Electronics Engineering

				technique based on the problem type
4	EE20AES201	ElectricalCircuit Analysis	C124.1	**Illustrate** the concept of Locus diagrams & Resonance
			C124.2	**Evalute** the various two port network parameters for the given network
			C124.3	**Determine** the transient response of R-L, R-C, R-L-C circuits for D.C. and A.C excitations
			C124.4	**Apply** Fourier transforms to electrical circuits excited by non-sinusoidal sources
			C124.5	**Analysis** of electrical networks, duality and dual networks. Design of different types of filters.
5	ME20AES101	EngineeringWorkshop	C125.1	**Apply** wood working skills in real world applications.
			C125.2	**Build** different parts with metal sheets in real world applications.
			C125.3	**Apply** fitting operations in various applications.
			C125.4	**Apply** different types of basic electric circuit connections.
6	CS20AES103	ITWorkshop	C126.1	Identify the Internal parts of computers and Generation of Computers. (L1)
			C126.2	Assemble and disassemble a computer from its parts and prepare the computer ready to use.(L3)
			C126.3	Installation process of different types Operating system for a computer by their own.(L3)
			C126.4	Interconnect two or more computers for information sharing.(L4)
			C126.5	Access the Internet and browse it for

Department of Electrical and Electronics Engineering

				required information.(L1)
7	CS20AES102	ProblemSolvingusingCLab	C127.1	**Develop** applications to slove the complex problems related to hardware and software
			C127.2	**Apply** problem solving techniques to find solutions to the problems
			C127.3	**Develop** the programs with modularity property
			C127.4	**Apply** logical skills to develop real world applications.
			C127.5	**Apply** searching and sorting techniques for solvingcomplex problems
8	CH20ABS104	ChemistryLab	C128.1	**Demonstrate** electro-analytical techniques for the chemical analysis.
			C128.2	**Determine** the cell constant and conductance of solutions
			C128.3	**Prepare** advanced polymer materials
			C128.4	**Measure** the strength of an acid present in secondary batteries
9	EE20AES202	ElectricalCircuit &SimulationLab	C129.1	Students will understand and experimentally verify various resonance phenomenon
			C129.2	Will be able to analyze various current locus diagrams
			C129.3	Can apply and experimentally analyze two port network parameters
			C129.4	Can perform simulation of various circuits using PSPICE software
			C129.5	Can perform simulation of resonance circuits using PSPICE software
10	CH20AMC201	EnvironmentalScience	C12A.1	**Understand** the concepts of environment and natural resourses
			C12A.2	**Classify** the types of ecosystems and conservation of bio-diversity.

Department of Electrical and Electronics Engineering

			C12A.3	**Identify** the causes and problems of pollution in real life situations .
			C12A.4	**Develop** awareness on social issues such as global warming, acid rains,ozone layer depletion and sustainalibility.
			C12A.5	**Determine** the consequences of population exploitation in detail.

II YEAR- I SEMESTER

SRI VENKATESWARA COLLEGE OF ENGINEERING
(Autonomous)

B.Tech-R20Regulations

ELECTRICAL&ELECTRONICSENGINEERING

IIB.Tech.–ISemester

S.NO	Subject Code	Course	COs	COURSE OUTCOMES
1	MA20ABS302	Complex Variables & Transforms	C211.1	**Apply** Cauchy-Riemann equations to find the analyticity of complex functions
			C211.2	**Apply** Cauchy's integral formula and Cauchy's integral theorem to evaluate improper integrals along contours improper integrals along contours
			C211.3	**Analyze** the concepts of Laplace Transforms to solve ordinary differential equations
			C211.4	**Examine** the Fourier series for different functions in half and full range
			C211.5	**Analyze** the concepts of Fourier Transforms and Z transforms to solve Difference equations
2	EE20APC301	Control Systems	C212.1	**Apply** the concepts of Block diagram reduction, Signal flow graph method and to

Department of Electrical and Electronics Engineering

				examine the concepts of control systems in realtime applications.
			C212.2	**Evaluate** the Time response and steady state error of given control system
			C212.3	**Analyze** the stability of a given control system in time domain.
			C212.4	**Analyze** the stability of a given control system in frequency domain, design of compensators
			C212.5	**Apply** the state space analysis for time variant system response
3	**EE20APC302**	**DC Machines & Transformers**	**C213.1**	**Demonstrate** the Concept of Electro mechanical energy conversion and magnetic field systems.
			C213.2	**Calculate** the emf generated on open circuit and find terminal voltage on load
			C213.3	**Analyze** the speed control of dc motors,testing methods and parallel operation of DC machines
			C213.4	**Conduct** OC & SC test and predetermine the regulation and efficiency of transformer
			C213.5	**Analyze** the three phase transformer conversions
4	**EC20APC307**	**Semiconductor Devices and Circuits**	**C214.1**	**Analyze**the operation of the PN junction diode under different operating conditions and its applications.
			C214.2	**Analyze** various semiconductor diodes and operating characteristics of transistor in CE, CB and CC configurations
			C214.3	**Design** an appropriate biasing circuit for a given application and h-parameter model of BJT amplifier
			C214.4	**Evaluate** the performance of CE, CB and CC amplifiers using approximate h-parameter model
			C214.5	**Design** a practical amplifier circuits using FET

Department of Electrical and Electronics Engineering

5	**BA20AHS301**	**Managerial Economics and Financial Analysis**	**C215.1**	**Understand** managerial economics and demand analysis
			C215.2	**Analyse** decisions relating to production and cost analysis
			C215.3	**Evaluate** market structures and forms of business
			C215.4	**Assess**financial statements and ratios
			C215.5	**Apply** capital budgeting methods
6	**EE20APC303**	**DC Machines &Transformers Lab**	**C216.1**	**Analyze** load test on DC shunt generators
			C216.2	**Determine** the magnetization characteristics of DC shunt generator
			C216.3	**Analyse** the concept of speed control techniques and efficiency of DC machines
			C216.4	**Understand** the concept of predetermine efficiency and regulation of single phase transformers
			C216.5	**Evaluation** of various losses occurs in the DC machines and transform
7	**EC20APC308**	**Semiconductor Devices and Circuits Lab**	**C217.1**	**Understand** the basic characteristics and applications of basic electronic devices
			C217.2	**Observe** the characteristics of electronic devices by plotting graphs
			C217.3	**Analyze**the V-I characteristics of various diodes, BJT and MOSFET
			C217.4	**Design** MOSFET / BJT based amplifiers for the given specifications
			C217.5	**Simulate** all circuits in PSPICE / Multisim
8	**EE20APC304**	**Control Systems &**	**C218.1**	Illustrate the effects of feedback on system performance for different loops

Department of Electrical and Electronics Engineering

		Simulation Lab	**C218.2**	Analyze test on DC Machine to determine the transfer function
			C218.3	Apply different types of controllers/compensators to achieve desired specifications
			C218.4	Demonstrate the characteristics of servo mechanisms used in automatic control applications
			C218.5	Illustrate MATLAB/SIMULINK software for control system analysis and design
9	**IT20ASC301**	**Application Development using Python**	**C219.1**	**List** the basic constructs of Python and Solve the problems by applying modularity principle
			C219.2	**Apply**the conditional execution of the program and Apply the principle of recursion to solve the problems
			C219.3	**Use** the data structure list and Design programs for manipulating strings
			C219.4	**Apply** object orientation concepts, Use data structure dictionaries and Organize data in the form of files
			C219.5	**Design** object oriented programs using Python for solving real-world problems
10	**CH20AMC301**	**Biology For Engineers**	**C21A.1**	**Understand**about life and life process
			C21A.2	**Explain**about biomolecules,their structure,function and their role in the living organisms.
			C21A.3	**Discuss**about the human physiology.
			C21A.4	**Explain** recombinant DNA technology and its application in different fields
			C21A.5	**Know**the production of medicines and pharmaceutical molecules through the transgenic microbes, plants and animals
11	**MA20AMC301**	**Logical Skills**	**C21B.1**	**Demonstrate** knowledge basic mathematics

Department of Electrical and Electronics Engineering

		for Professionals-II		to develop analytical skills to solving problems of Averages - Percentages - Ratio
			C21B.2	**Demonstrate** knowledge basic mathematics to develop analytical skills to solving problems of Partnership - Simple Interest and Compound Interest and time and stance
			C21B.3	**Demonstrate** knowledge basic mathematics to develop analytical skills to solving problems of time ad work, problems on trains and Boats and streams
			C21B.4	**Analyze** the techniques in series, coding and decoding and blood relations
			C21B.5	**Analyze** the techniques in directions, problems on ages and analogy

II YEAR- II SEMESTER

SRI VENKATESWARA COLLEGE OF ENGINEERING
(Autonomous)

SRI VENKATESWARA COLLEGE OF ENGINEERING
(Autonomous)
Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507.
Accredited by NBA (B.Tech – CSE, ECE,EEE,Mech.,Civil and IT) & NAAC with 'A' Grade
Approved by AICTE, New Delhi permanently affiliated to JNTUA, Ananthapuram.

Department of Electrical and Electronics Engineering

B.Tech-R20Regulations
ELECTRICAL&ELECTRONICSENGINEERING
IIB.Tech.–IISemester

S.NO	Subject Code	Course	COs	COURSE OUTCOMES
1	CS20AES401	DataStructuresusing C	C221.1	Analyzetheproblemsusingasymptoticnotations.
			C221.2	ApplyStack,Queuesandlinkedlisttosolvedifferentapplications.
			C221.3	Demonstratesuitablesortingtechniquesfortherealworldproblem.
			C221.4	Implement tree structures in different patterns of representation of data.(L3)
			C221.5	Analyzethegivenproblemusinggraphtraversaltechniques.
2	MA20ABS401	NumericalMethods, Probability&Statistics	C222.1	**Apply** numerical methods to solve algebraic and transcendental equations
			C222.2	**Derive** interpolating polynomials using interpolation formulae
			C222.3	**Solve** differential and integral equations numerically
			C222.4	**Apply** Probability theory to find the chances of happening of events.
			C222.5	**Understand** various probability distributions and calculate their statistical constants.
3	EE20APC401	RotatingACMachines	C223.1	Understand the basics of ac machine windings, construction, principle of working, quivalent circuit of induction and synchronous machines.

Department of Electrical and Electronics Engineering

			C223.2	Analyze the phasor diagram, efficiency, starting and maximum torque, effect of parameter variation on torque speed characteristics
			C223.3	Understand the constructional features, principle involved, equivalent circuit of single- phase induction motor and various starting methods and its applications
			C223.4	Understand the constructional features, principle involved, equivalent circuit of single- phase induction motor and various starting methods and its applications
			C223.5	Analyze the phasor diagram, determination of V and inverted V curves and power circles of synchronous motor
4	EC20AES301	DigitalElectronics& Microprocessors	**C224.1**	**CO1:**TounderstandtheconceptofLogiccircuits andanalyzevariousBooleanalgebrafunctions.
			C224.2	**CO2:**TounderstandtheconceptofCombinationalLogicand SequentialLogicCircuits.
			C224.3	**CO3:**TocreatecombinationalcircuitsusingPLD's.
			C224.4	**CO4:**TounderstandandAnalyzethecounters,
			C224.5	**CO5:**Tounderstandtheconceptsof8085,8086 Microprocessorand8051Microcontroller.
5	EE20APC402	ElectromagneticFieldTheory	**C225.1**	**Apply** the Knowledge of basic principles and fundamental laws like Coulomb's, Gauss's etc., of Electrostatics.
			C225.2	**Analyse** the behavior of conductors and Dielectric material in an Electric field.
			C225.3	**Apply** the Knowledge of basic principles, concepts and fundamental laws like Biot-Savart's, Ampere's Circuital etc., of Magnetostatics.
			C225.4	**Evaluate** Self-Inductance of a Solenoid, Toroid and Mutual Inductance.
			C225.5	**Evaluate** the quantities associated with

Department of Electrical and Electronics Engineering

				uniform plane wave motion in different media of transmission.
6	CS20AES402	DataStructuresLab	**C226.1**	• DemonstratetheconceptofRecursionforsolvingaproblem.(L4)
			C226.2	• Chooseandimplementlineardatastructuretosolveproblems.(L3)
			C226.3	• Developprogramsforsearchingandsortingalgorithms.(L3)
			C226.4	• Selectandimplementsuitablenonlineardatastructureforsolvingaproblem.(L3)
			C226.5	
7	EC20AES302	DigitalElectronics& MicroprocessorsLab	**C227.1**	**CO1:** Analyze the concepts of Logic Gates and Boolean functions.**CO2:** Analyze Combinational Logic and Sequential Logic Circuits.**CO3:**AnalyzethelogiccircuitsusingProgrammableLogicDevices.
			C227.2	**CO4:**Applyknowledgeanddemonstrateprogrammingproficiencyusingvariousaddressingmodesandinstructionsetsof8086&8051.
			C227.3	**CO1:** Analyze the concepts of Logic Gates and Boolean functions.**CO2:** Analyze Combinational Logic and Sequential Logic Circuits.**CO3:**AnalyzethelogiccircuitsusingProgrammableLogicDevices.
			C227.4	**CO4:**Applyknowledgeanddemonstrateprogrammingproficiencyusingvariousaddressingmodesandinstructionsetsof8086&8051.

Department of Electrical and Electronics Engineering

			C227.5	
8	EE20APC403	ACMachinesLab	**C228.1**	• **Apply** load test, no-load and blocked-rotor tests for construction of circle diagram motor.
			C228.2	**Evaluate** the equivalent circuit of a single phase induction motor
			C228.3	**Determine** regulation of a three-phase alternator by synchronous impedance &m.m.f methods.
			C228.4	**Calculate** the regulation of Alternator by Zero Power Factor method, Xd and Xq determination of salient pole synchronous machine.
			C228.5	**Evaluate and analyze** V and inverted V curves of 3 phase synchronous motor
9	EG20ASC301	SoftSkills	**C229.1**	**Memorize**variouselementsofeffectivecommunicativeskills
			C229.2	**Interpret**peopleattheemotionallevelthroughemotionalintelligence
			C229.3	**Apply**criticalthinkingskillsinproblemsolving
			C229.4	**Analyze**theneedsofanorganizationforteambuilding
			C229.5	**Judge**thesituationandtakenecessarydecisionsasaleader
10	*BA20AHS201	UniversalHumanValues	**C22A.1**	**Understanding**thevalueofeducation tobecome moreawareof themselves,andtheirsurroundings(family,society,nature).
			C22A.2	**Utilize** the concepts of human being-harmony in myself becomemore responsible in life, and in handling

Department of Electrical and Electronics Engineering

				problems with sustainable solutions,whilekeepinghumanrelationship sandhumannatureinmind.
			C22A.3	**Understanding** theconceptsofsociety-harmonyinhumanforbettercritical ability.
			C22A.4	**Understanding**thehumanvalues,humanrelationshipandhumansocietytobecomesensitivetotheircommitment
			C22A.5	**Apply** whattheyhavelearnttotheirownselfin differentday-to-daysettingsinreallife,atleastabeginningwouldbemadeinthisdirection

III YEAR- I SEMESTER

JAWAHARLALNEHRUTECHNOLOGICALUNIVERSITYANANTAPUR

(EstablishedbyGovt.ofA.P.,Act.No.30of2008)

ANANTHAPURAMU–515002(A.P.)INDIA.

B.Tech-R19Regulations

ELECTRICAL&ELECTRONICSENGINEERING

IIIB.Tech.–ISemester

S.NO	Subject Code	Course	COs	COURSE OUTCOMES
1	**19A02501T**	**AC Machines**	**C311.1**	Understand the basics of ac machine windings, construction, principle of working, quivalent circuit of induction and synchronous machines.
			C311.2	Analyze the phasor diagram, efficiency, starting and maximum torque, effect of parameter variation on torque speed characteristics
			C311.3	Understand the constructional features, principle

Department of Electrical and Electronics Engineering

				involved, equivalent circuit of single- phase induction motor and various starting methods and its applications
			C311.4	Understand the constructional features, principle involved, equivalent circuit of single- phase induction motor and various starting methods and its applications
			C311.5	Analyze the phasor diagram, determination of V and inverted V curves and power circles of synchronous motor
2	**19A02502**	**Control Systems**	**C312.1**	**Apply** the concepts of Block diagram reduction, Signal flow graph method and to examine the concepts of control systems in realtime applications.
			C312.2	**Evaluate** the Time response and steady state error of given control system
			C312.3	**Analyze** the stability of a given control system in time domain.
			C312.4	**Analyze** the stability of a given control system in frequency domain, design of compensators
			C312.5	**Apply** the state space analysis for time variant system response
3	**19A52601T**	**English Language Skills**	**C313.1**	**Facilitate** active listening to enable inferential learning through expert lectures and talks
			C313.2	**Impart** critical reading strategies for comprehension of complex texts
			C313.3	**Provide** training and opportunities to develop fluencyin English through participation informal group discussions and presentations using audio-visual aids
			C313.4	**Demonstrate** good writing skills for effective paraphrasing,argumentative essays and formal correspondence
			C313.5	**Encourage** use of a wide range of grammatical structures and vocabulary in speech and writing
4	**19A02504**	**Electrical Machine Design**	**C314.1**	**Analyze** various design factors, types of windings, choice of machine, selection and ratings electrical machines

Department of Electrical and Electronics Engineering

			C314.2	**Design** the specific loadings and magnetic circuits of DC machines
			C314.3	**Compute** and Analyse the 1-ϕ transformer based on type of winding, Design of insulation,
			C314.4	**Compute and design** the three phase induction machines based on Various factors
			C314.5	**Analyze** the construction of 3-ϕ Synchronous machine based on specified rating
5	**19A02503a**	**HVDC and FACTS**	**C315.1**	**Compare** AC and DC systems, Describe the Types of HVDC Links and FACTS devices and Explain various parameters in HVDC.
			C315.2	**Analyze** the Graetz circuit with various conditions.
			C315.3	**Apply** various control schemes, Analyze the frequency control and Tap changer control.
			C315.4	**Analyze** the various types of FACTS controllers and Operation of various Shunt and Series devices and their control.
			C315.5	**Analyze**the Operation of UPFC, IPFC and their control.
			C315	
6	**19A27506b**	**Computer Applications in Food Industry**	**C316.1**	Analyze the importance of Computerization and IT applications in food industries and need for development of Computer operating environment and information system for various types of food industries.
			C316.2	Learn the basic concepts of 'C'.
			C316.3	Analyze the operation of branching and looping statements.
			C316.4	Use the concept of functions,Arrays,strings.
			C316.5	Apply the Concept of Pointers, Structures,Unions, data structures, linked lists.
7	**19A02501P**	**AC Machines Lab**	**C317.1**	**Apply** load test, no-load and blocked-rotor tests for construction of circle diagram

Department of Electrical and Electronics Engineering

			C317.2	**Evaluate** the equivalent circuit of a single phase induction motor
			C317.3	**Determine** regulation of a three-phase alternator by synchronous impedance &m.m.f methods.
			C317.4	**Calculate** the regulation of Alternator by Zero Power Factor method, Xd and Xq determination of salient pole synchronous machine.
			C317.5	**Evaluate and analyze** V and inverted V curves of 3 phase synchronous motor
8	**19A52601P**	**English Language Skills Lab**	**C318.1**	**To expos**e the students to variety of self instructional, learner friendly modes of language learning
			C318.2	**To help** the students cultivate the habit of reading passages from the computer monitor. Thus providing them with the required facility to face computer based competitive exams like GRE, TOEFL, and GMAT etc.
			C318.3	**To enable** them to learn better pronunciation through stress, intonation and rhythm
			C318.4	**To train** them to use language effectively to face interviews, group discussions, public speaking
9	**19A02506**	**Power Electronics & Simulation Lab**	**C319.1**	**Analyze** different types of firing circuits for SCRs
			C319.2	**Analyze** different types of converters and Inverters, Choppers, AC Voltage Controllers, Cycloconverters and Dual converter with R and RL loads
			C319.3	**Analyze** different types of forced commutation circuits
			C319.4	**Analyze** lighting control and speed control by using TRIAC
			C319.5	**Illustrate** WEBENCH software for Power Electronics Converters analysis and design.
10	**19A99601**	**Research Methodology**	**C31A.1**	**Understand** the basic concepts of research and its methodologies

Department of Electrical and Electronics Engineering

			C31A.2	**Analyze** the research problem and apply appropriate sampling method for data collection
			C31A.3	**Apply** different methods for analysis purpose
			C31A.4	**Analyze** various types of testing tools used in research
			C31A.5	**Design** a research paper by following research ethics
11	**19A02507**	**Socially Relevant Project**	**C31B.1**	**Identify** the problem statement by observing the problems in the society, for which electronics engineers can propose a solution.
			C31B.2	**Develop** the design methodolgy for implementing the chosen project.
			C31B.3	**Apply** appropriate modern tools for implementing the project work.
			C31B.4	**Evaluate** application of project work with appropriate societal consideration.
			C31B.5	**Develop** presentation and interpersonal communication skills through presentations and documentation.

III YEAR-II SEMESTER

JAWAHARLALNEHRUTECHNOLOGICALUNIVERSITYANANTAPUR

(EstablishedbyGovt.ofA.P.,Act.No.30of2008)

ANANTHAPURAMU–515002(A.P.)INDIA.

B.Tech-R19Regulations

ELECTRICAL&ELECTRONICSENGINEERING

IIIB.Tech.–IISemester

S.NO	Subject Code	Course	COs	COURSE OUTCOMES
1	**19A04301**	**Signals & systems**	**C321.1**	**Classify** signals and systems(continuous and discrete)in a time domain and

Department of Electrical and Electronics Engineering

				frequency domain.
			C321.2	**Analyze**continuous-time signals using Continuous Time Fourier Transform.
			C321.3	**Analyze**Discrete-time signals using Discrete Fourier Transform.
			C321.4	**Analyze** Signal Transmission through Linear System.
			C321.5	**Analyze** systems (continuous and discrete) using Laplace Transforms and Z-Transforms.
2	**19A02601T**	**Digital Computer Platforms**	**C322.1**	**Understand** the basic architecture & pin diagram of 8086 microprocessor
			C322.2	**Develop** Assembly language programs to perform a given task, Interrupt service routines for all interrupt types
			C322.3	**Analyze** the various applications of Microprocessor and Microcontroller
			C322.4	**Develop** Assembly Language Programs for the Digital Signal Processors and use Interrupts for real-time control applications
			C322.5	**Illustrate** the Xilinx programming and understanding of Spartan FPGA board
3	**19A02602**	**Power System Analysis**	**C323.1**	**Analyze** the concepts of per unit system, determine the Ybus of a given power system network.
			C323.2	**Evaluate** the Zbus of a given power system network.
			C323.3	**Illustrate** the load flow studies on a given power system network using GS, NR and FDLF methods.
			C323.4	**Demonstrate** the concepts fault analysis, symmetrical component theory and application of series reactor
			C323.5	**Analyze** the concept of steady state stability and transient stability of Power

Department of Electrical and Electronics Engineering

				System Network.
4	**19A02603a**	**Power Quality**	**C324.1**	**Discuss** the various types of power quality problem
			C324.2	**Analyze** the sources ,types and mitigation of voltage sag problem
			C324.3	**Analyze** the sources , types and mitigation of over voltage issues and model of over voltage problem with computer software tools.
			C324.4	**Evaluate** the effects of harmonics on power system equipments and analyze the methods of controlling of harmonics.
			C324.5	**Explain** the principle of operation of various types of power quality monitoring devices.
5	**19A03604b**	**Optimization Techniques Through MATLAB**	**C325.1**	**Choose** optimization terminology and concepts, and **understand** an optimization problem
			C325.2	**Apply** optimization methods to engineering problem
			C325.3	**Analyze**optimization algorithms
			C325.4	**Classify** genetic algorithms
			C325.5	**Evaluate** multivariable optimization problems.
6	**19A52602a**	**Entrepreneurship & Incubation**	**C326.1**	**Apply the** concept of Entrepreneurship and challenges in the world of competition.
			C326.2	**Develop** Knowledge in generating ideas for New Ventures.
			C326.3	**Analyze**various sources of finance and subsidies to entrepreneur/women Entrepreneurs.
			C326.4	**Evaluate** the role of central government and state government in promotingEntrepreneurship
			C326.5	**Create and design** business plan structure

Department of Electrical and Electronics Engineering

				through incubations
7	**19A02605**	**Control Systems & Simulation Lab**	**C327.1**	**Illustrate** the effects of feedback on system performance for different loops
			C327.2	**Analyze**test on DC Machine to determine the transfer function
			C327.3	**Apply** different types of controllers/compensators to achieve desired specifications
			C327.4	**Demonstrate** the characteristics of servo mechanisms used in automatic control applications
			C327.5	**Illustrate** MATLAB/SIMULINK software for control system analysis and design.
8	**19A02601P**	**Digital Computer Platforms Lab**	**C328.1**	**Understand** the concept of microprocessor and its interfacing devices.
			C328.2	**Develop** Assembly language programming on 8086 Microprocessors
			C328.3	**Analyze** the Interfacing of various devices with 8086
			C328.4	**Demonstrate** the MASAM Programming
			C328.5	**Analyze** how to Interfacing 8051 Microcontroller with its peripheral devices.
9	**19A02606**	**Socially Relevant Project**	**C329.1**	**Identify** the problem statement by observing the problems in the society, for which electronics engineers can propose a solution.
			C329.2	**Develop** the design methodolgy for implementing the chosen project.
			C329.3	**Apply** appropriate modern tools for implementing the project work.
			C329.4	**Evaluate** application of project work with appropriate societal consideration.

Department of Electrical and Electronics Engineering

			C329.5	**Develop** presentation and interpersonal communication skills through presentations and documentation.

IV YEAR-I SEMESTER

JAWAHARLALNEHRUTECHNOLOGICALUNIVERSITYANANTAPUR

(EstablishedbyGovt.ofA.P.,Act.No.30of2008)

ANANTHAPURAMU–515002(A.P.)INDIA.

B.Tech-R15Regulations

ELECTRICAL&ELECTRONICSENGINEERING

IVB.Tech.–ISemester

S.NO	Subject Code	Course	COs	COURSE OUTCOMES
1	15A02701	Electrical Distribution Systems	C411.1	**Apply** the various factors associated with power distribution system
			C411.2	**Evaluate** voltage drop calculations in given distribution networks
			C411.3	**Demontrate**the functionality of various types of substations.
			C411.4	**Analyze** power factor improvement for a given system and load
			C411.5	**Examine** the implementation of SCADA for distribution automation.
2	15A04603	Digital Signal Processing	C412.1	**Classify** discrete time signals & systems and represent in frequency domain
			C412.2	**Compute** DFT using different FFT algorithms
			C412.3	**Analyze** different FIR & IIR structures for filter implementations

Department of Electrical and Electronics Engineering

			C412.4	**Design** FIR and IIR filters using various techniques
			C412.5	**Analyze** the basics of Multirate Digital Signal Processing & its Applications
3	**15A02702**	**Power System Operation & Control**	C413.1	**Analyze**the Operation of Hydrothermal scheduling and Optimum generation allocation
			C413.2	**Demonstrate** the modeling of turbines and generators and apply different techniques to balancing the load and generated power
			C413.3	**Apply** the Load frequency control in single area and two area systems from generation to distribution
			C413.4	**Analyze**reactive power compensation techniques in power systems for various loads
			C413.5	**Illustrate** Power system operation in presnet competitive environment
4	**15A02703**	**Utilization Electrical Energy**	C414.1	**Demonstrate** a lighting scheme for a given practical case.
			C414.2	**Analyze** the performance of Heating and Welding methods
			C414.3	**Analyze** the components requirement for electric traction and their calculations
			C414.4	**Evaluate** the numerical calculations associated with electric traction due to the variation of parameters
			C414.5	**Illustrate** the economic aspects in utilisation of electrical energy
5	**15A02706**	**Energy Auditing & Demand Side Management**	C415.1	**Analyze** energy consumption, energy auditing and evaluate energy audit results
			C415.2	**Illustrate** various techinques to improve power factor and energy efficient motors
			C415.3	**Evaluate** lighting energy audit and analyse various instruments utilised as energy instruments

Department of Electrical and Electronics Engineering

			C415.4	**Analyze**demand side management concepts through case study
			C415.5	**Analyze**economics and cost effectiveness tests of DSM programs
6	**15A02708**	**Flexible AC Transmission Systems**	C416.1	**Understand** different types of FACTS Controllers
			C416.2	**Analyze**Operation of VSC and CSC
			C416.3	**Evaluate the c**oncept of Shunt controllers and its applications
			C416.4	**Analyse** the application of Series Controllers
			C416.5	**Evaluate** the operation of UPFC and IPFC
7	**15A04608**	**Digital Signal Processing Laboratory**	C417.1	**Develop** various DSP Algorithms using MATLAB Software
			C417.2	**Evaluate** Frequency response Characteristics of digital FIR & IIR filters.
			C417.3	**Analyze**real time DSP systems and real world applications.
			C417.4	**Design** various analog filters.
			C417.5	**Analyze** DSP algorithms using both fixed and floating point processors.
8	**15A02710**	**Power Systems & Simulation Laboratory**	C418.1	**Evaluate** the Subtransient reactance and Sequence impedance of Synchronous Machines
			C418.2	**Analyse** the Fault analysis in Power System Network with the help of Zbus
			C418.3	**Evaluate** the Load flow studies with the help of Ybus
			C418.4	**Design** three winding transformer by conducting a suitable experiment.
			C418.5	**Create** the SIMULINK model for single area load frequency control problem.

SRI VENKATESWARA COLLEGE OF ENGINEERING
(Autonomous)
Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507.
Accredited by NBA (B.Tech – CSE, ECE,EEE,Mech.,Civil and IT) & NAAC with 'A' Grade
Approved by AICTE, New Delhi permanently affiliated to JNTUA, Ananthapuram.

Department of Electrical and Electronics Engineering

IV YEAR-II SEMESTER

JAWAHARLALNEHRUTECHNOLOGICALUNIVERSITYANANTAPUR

(EstablishedbyGovt.ofA.P.,Act.No.30of2008)

ANANTHAPURAMU–515002(A.P.)INDIA.

B.Tech-R15Regulations

ELECTRICAL&ELECTRONICSENGINEERING

IVB.Tech.–IISemester

S.NO	Subject Code	Course	COs	COURSE OUTCOMES
1	15A02801	Instrumentation	C421.1	**Analyze**different types of errors occurring in measurement
			C421.2	**Illustrate** advanced data transmission, Telemetry and DAS
			C421.3	**Evaluate** the operation of signal analyzers and digital meters
			C421.4	**Examine** the operation of various transducers and it's operating principles
			C421.5	**Apply** the knowledge to measure the non-electrical quantities
2	15A02804	HVDC Transmission	C422.1	**Apply** the basic concept of HVAC and HVDC transmission
			C422.2	**Analyse** the operationof various converters used in HVDC transmission system
			C422.3	**Evalute**the operation of various control strategies used in HVDC transmission system.
			C422.4	**Illustate**the operation harmonics supression in HVDC system
			C422.5	**Examine** the operation of HVDC and AC filter
3	15A02807	Technical Seminar	C423.1	**Interpret** the recent technological updations.
			C423.2	**Prepare** Presentation and seminar report on the specified technical topic.

Department of Electrical and Electronics Engineering

			C423.3	**Develop** knowledge, presentation and communication skills.
			C423.4	**Defend** or convince the audience during viva process.
4	15A02808	Project Work	C424.1	**Identify** the socially relevant problems and define the problem statement.
			C424.2	**Analyze**and categorize executable project modules by applying acquired knowledge and skills with due consideration of constraints
			C424.3	**Use** efficient resources/IT tools for designing project modules
			C424.4	**Combine** all the modules through effective team work after efficient testing and simulation
			C424.5	**Improve** the team building, communication and management skills
			C424.6	**Elaborate** the completed task and demonstrate working of the model/module in most convincing manner
			C424.7	**Compile** the project report with appropriate writing skills.
			C424.8	**Predict** the consequences of developed model in terms of safety, health hazards and ensure ethical values
			C424.9	**Verify** the scope of transforming model/module into marketable product through proper financial management

HOD/EEE
H.O.D. E.E.E.
S.V. COLLEGE OF ENGINEERING
KARAKAMBADI ROAD, TIRUPATI-517 507.

SRI VENKATESWARA COLLEGE OF ENGINEERING
Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507.
Department of Electronics and Communication Engineering

PROGRAMME OUTCOMES

PO1: Engineering Knowledge
An ability to apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems as appropriate to the field of electronics & communication engineering practice.

PO2: Problem Analysis
Ability to Identify, formulates, review research literature, and analyze complex Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions
Ability to 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
Apply research-based knowledge and research methods including design of experiments, analysis and interpretation of data pertaining to Electronics & Communication Engineering problems and arrive valid conclusions.

PO5: Modern tool usage
An ability to use the techniques, resources and modern engineering tools necessary for modeling the complex system design in Electronics and Communication Engineering.

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
An Ability to understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of 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 in both verbal and written forms 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 or a leader in a team, to manage projects 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.

PROGRAMME SPECIFIC OUTCOMES

PSO1: An ability to get an employment in Electronics and Communication Engineering field and related industries and to participate & succeed in competitive examinations like GRE, GATE,TOEFL, PSUs, etc.

PSO2: Should be able to design and test various electronic systems that perform analog and digital processing functions.

HEAD OF THE DEPARTMENT
ELECTRONICS & COMMUNICATION ENGINEERING
S.V. COLLEGE OF ENGINEERING
KARAKAMBADI ROAD, TIRUPATI-517 507.

SRI VEN[illegible]ATESWARA COLLEGE OF ENGINEERING
Karakambadi [illegible]ad, Opposite LIC Training Centre, Tirupati – 517 507.
Departm[illegible]ent of Electronics and Communication Engineering

S. No	COURSE NAME	COs	COURSE OUTCOMES
1	Linear Algebra & Calculus (MA20ABS101)	C111.1	Solve the system of linear [illegible]quations and reduce the quadratic forms to canonical form by applying matrices.
		C111.2	Apply mean value theorems to [illegible]olve real valued functions.
		C111.3	Familiarize with functions of [illegible]veral variables which is useful in optimization.
		C111.4	Apply multiple integrals to find the area and volumes for different functions.
		C111.5	Analyze the concepts of Beta and Gamma special function for different functions.
2	Applied Physics (PH20ABS103)	C112.1	Analyze the intensity variation of light due to Interference, diffraction and polarization.
		C112.2	Distinguish the types of lasers and apply its principles in modern technology.
		C112.3	Analyze the concept of dielectric and magnetic materials for potential applications in the emerging micro devices.
		C112.4	Apply the fundamentals of quantum mechanics and their applications to study the behaviour free electrons in solids.
		C112.5	Apply the basic concepts of semiconductor and superconductivity in Engineering applications.
3	Communicative English (EG20AHS101)	C113.1	Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English.
		C113.2	Apply grammatical structures to formulate sentences and correct word forms.
		C113.3	Analyze discourse markers to speak clearly on a specific topic in informal discussions.
		C113.4	Evaluate reading/listening texts and to write summaries based on global comprehension of these texts.
		C113.5	Create a coherent paragraph interpreting a figure/graph/chart/table.
4	Fundamentals of Electrical Circuits (EE20AES103)	C114.1	Given a network, able to find equivalent impedance by using network reduction techniques and determine the current through any element and voltage across and power through any element.
		C114.2	Given a circuit and the excitation, determine the real power, reactive power, power factor etc,
		C114.3	Apply the network theorems suitably to analyze complex circuits and determine the effective voltages and currents in the circuit.
		C114.4	Determine the Dual of the Network, develop the Cut Set and Tie-set Matrices for a given Circuit.
		C114.5	Analyze the three-phase balanced and unbalanced circuits and to measure active and reactive powers in three phase circuits
5	Engineering Drawing (ME20AES102)	C115.1	Draw basic geometrical constructions, curves used in engineering practices.
		C115.2	Understand the concept of projection and acquire visualization skills, projection of points, Lines and Planes.
		C115.3	Illustrate the projections of solids graphically.
		C115.4	Draw and explore the sectional views of right regular solids.
		C115.5	Draw the development of surfaces of solids.
6	Engineering Graphics Lab (ME20AES103)	C116.1	Draw the basic views related to projections of Lines, Planes.
		C116.2	Draw the basic views related to projections of Planes.
		C116.3	Illustrate orthographic views of simple objects.
		C116.4	Illustrate isometric projections of simple solids.
		C116.5	Interpret and comprehend with drafting packages for engineering practice
7	Applied Physics Lab (PH20ABS104)	C117.1	Apply skill to find the wavelength of spectral lines using plane diffraction grating.
		C117.2	Analyze the usage of dielectric materials applications.
		C117.3	Apply the concept of hysteresis curve of a ferromagnetic material to know the strength of magnetic material.
		C117.4	Analyze the working principles of semiconducting devices to study the applications of semiconducting technology.
		C117.5	Differentiate the patterns of spectrums using interference and diffraction phenomena.
8	Communicative English Lab (EG20AHS101)	C118.1	Develop to handle and excel in a variety of self-instructional, learner-friendly modes of language learning
		C118.2	Develop to employ better stress and intonation patterns and utter English sounds correctly.
		C118.3	Develop to avoid the impact of mother tongue in English and neutralize their accent.
		C118.4	Develop to participate with skill and confidence in Group Discussions, Interviews and Public Speaking

S. No.	COURSE NAME	COs	COURSE OUTCOMES
		C118.5	Utilize the technical skills to prepare resume, report-writing, and formatmaking etc.
9	Fundamentals Of Electrical Circuits Lab (EE20AES104)	C119.1	Distinguish analogy between electric and magnetic circuits and apply the principles to determine circuit parameters.
		C119.2	Remember, understand and apply various theorems and verify practically.
		C119.3	Understand and analyze active, reactive power measurements in three phase balanced & unbalanced circuit.
10	Logical Skills for Professionals (MA20AMC102)	C11A.1	Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Averages - Percentages - Ratio.
		C11A.2	Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Partnership - Simple Interest and Compound Interest and time and distance.
		C11A.3	Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of time ad work, problems on trains and Boats and streams.
		C11A.4	Analyze the techniques in series, coding and decoding and blood relations.
		C11A.5	Analyze the techniques in directions, problems on ages and analogy.
11	Differential Equations and Vector Calculus (MA20ABS201)	C121.1	Solve the differential equations related to various engineering fields.
		C121.2	Solve the linear differential equations of higher order related to various engineering fields.
		C121.3	Identify solution methods for partial differential equations that model physical processes.
		C121.4	Interpret the physical meaning of different operators such as gradient, curl and divergence.
		C121.5	Estimate the work done against a field, circulation and flux using vector calculus.
12	Chemistry (CH20ABS103)	C122.1	Categorize the different problems present in the water and usage of technology to improve the quality of water.
		C122.2	Compare octahedral and tetrahedral complexes in crystal field theory and develop knowledge on super capacitors ,semi conductors, nanomaterials.
		C122.3	Apply the basic concepts of electro analytical techniques that facilitate rapid and reliable measurements.
		C122.4	Distinguish polymerization reactions with mechanisms and their applications.
		C122.5	Use the principle of instrumentation to analyze the chemical and biological components.
13	Problem Solving Using C (CS20AES101)	C123.1	Solve computational problems.
		C123.2	Select the features of C language appropriate for solving a problem.
		C123.3	Design computer programs for real world problems.
		C123.4	Organize the data which is more appropriated for solving a problem.
14	Electronic Devices and Circuits(EC20AES201)	C124.1	Understand principle of operation, characteristics and applications of Semi conductor diodes, Bipolar Junction Transistor and MOSFETs.
		C124.2	Apply the basic principles for solving the problems related to Semiconductor diodes, BJTs, and MOSFETs.
		C124.3	Analyze diode circuits for different applications such as rectifiers, clippers and clampers also analyze biasing circuits of BJTs, and MOSFETs.
		C124.4	Design diode circuits and amplifiers using BJTs, and MOSFETs.
		C124.5	Compare the performance of various semiconductor devices.
15	Engineering Workshop (ME20AES101)	C125.1	Identify tools, work material, measuring instruments useful for domestic applications.
		C125.2	Apply wood working skills in real world applications.
		C125.3	Build different parts with metal sheets in real world applications.
		C125.4	Apply fitting operations in various applications for good strength.
		C125.5	Analyze different types of basic electric circuit connections.
		C125.5	Demonstrate soldering and brazing in joining circuits.
		C125.6	Make moulds for sand casting using standard equipment.
		C125.7	Develop different weld joints for various metals.
		C125.8	Inspect various parts of machine components.
		C125.9	Make plastic components using proper raw material.
16	IT Workshop (CS20AES103)	C126.1	Identify the Internal parts of computers and Generation of Computers.
		C126.2	Assemble and disassemble a computer from its parts and prepare the computer ready to use.
		C126.3	Installation process of different types Operating system for a computer by their own.
		C126.4	Interconnect two or more computers for information sharing.
		C126.5	Access the Internet and browse it for required information.
		C126.6	Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX.
		C126.7	Prepare slide presentation using the presentation tool.

S. No.	COURSE NAME	CO#	COURSE OUTCOMES
17	Problem Solving Using C Lab (CS20AES102)	C127.1	Build algorithm and flowchart for simple problems.
		C127.2	Use suitable control structures to solve problems.
		C127.3	Use suitable iterative statements, arrays and modular programming to solve the problems.
		C127.4	Implement Programs using pointers and String handling Functions.
		C127.5	Develop code for complex applications using structures, unions and file handling features.
18	Chemistry Lab (CH20ABS104)	C128.1	Demonstrate electro-analytical techniques for the chemical analysis.
		C128.2	Apply Beer-Lambert Law to know the concentration of unknown samples.
		C128.3	Analyze the quality and quantity of chemical compounds in given samples.
		C128.4	Prepare different types of polymers.
19	Electronic Devices & Circuits Lab (EC20AES202)	C129.1	Understand the basic characteristics and applications of basic electronic devices. (L1)
		C129.2	Observe the characteristics of electronic devices by plotting graphs.
		C129.3	Analyze the Characteristics of UJT, BJT, MOSFET .
		C129.4	Design MOSFET/ BJT based amplifiers for the given specifications.
		C129.5	Simulate all circuits in PSPICE/Multisim.
20	Environmental Science (CH20AMC201)	C12A.1	Understand the concepts of environment and natural resourses.
		C12A.2	Classify the types of ecosystems and conservation methods of bio-diversity.
		C12A.3	Identify the causes and problems of pollution in their real life situations.
		C12A.4	Develop awareness on social issues such as global warming, acid rains,ozone layer depletion and sustainalibility.
		C12A.5	Determine the consequences of population exploitation in detail.
21	Speech and Oral Communication (EG20AMC103)	C12B.1	Improve the neutral accent and be free from mother tongue influence.
		C12B.2	Hypothesizing small talks on general topics and learn critiquing skills by participating in Conversations.
		C12B.3	Applying Vocabulary and using it in their day-to-day life.
		C12B.4	Understanding and mastering in verbal and non-verbal communication.
22	Complex Variables and Transforms (MA20ABS302)	C211.1	Apply Cauchy-Riemann equations to find the analyticity of complex functions.
		C211.2	Apply CauchY integral formula and Cauchy Integral theorem to evaluate improper integrals along contours.
		C211.3	Analyze the concepts of Laplace Transforms to solve ordinary differential equations.
		C211.4	Examine the Fourier series for different functions in half and full range.
		C211.5	Analyze the concepts of Z transforms to solve Difference equations
		C211.6	Analyze the concepts of Z transforms to solve Difference equations
23	Digital Logic Design (EC20APC301)	C212.1	Understand the properties of Boolean algebra, other logic operations, and minimization of Boolean functions using Karnaugh map.
		C212.2	Make use of the concepts to solve the problems related to the logic circuits.
		C212.3	Analyze the combinational and sequential logic circuits.
		C212.4	Compare various Programmable logic devices.
		C212.5	Compare the concepts of RAM and ROM.
		C212.6	Understand the operation CMOS, TTL logic families, ECL logic families and interfacing between them.
24	Electronic Circuit Analysis & Design (EC20APC302)	C213.1	Understand the working principle of multistage amplifiers, Feedback amplifiers, power amplifiers and tuned amplifiers.
		C213.2	Analyze multistage amplifiers, feedback amplifiers, power amplifiers, and tuned amplifiers.
		C213.3	Design multistage amplifiers, feedback amplifiers, oscillators, power amplifiers and tuned amplifiers for the given specification.
		C213.4	Evaluate the efficiency of large signal (power) amplifiers.
		C213.5	Compare the frequency response of Single-stage, Double-stage amplifiers with Single tuned, double tuned and Stagger tuned amplifiers
25	Signals & Systems (EC20APC303)	C214.1	Understand the mathematical description and representation of continuous- time and discrete-time signals and systems. Also understand the concepts of various transform techniques.
		C214.2	Apply sampling theorem to convert continuous-time signals to discrete-time signals and reconstruct back, different transform techniques to solve signals and system related problems.
		C214.3	Analyze the frequency spectra of various continuous-time signals using different transform methods.
		C214.4	Analyze the systems based on their properties and determine the response of them.
		C214.5	Analyze the frequency spectra of various discrete-time signals using different transform methods.

S. No.	COURSE NAME	COs	COURSE OUTCOMES
26	Managerial Economics and Financial Analysis (BA20AHS301)	C215.1	Should be able to understand managerial economics and demand analysis.
		C215.2	Should be able to analyze decisions relating to production and cost analysis.
		C215.3	Should be able to evaluate market structures and forms of business.
		C215.4	Should be able to assess financial statements and ratios.
		C215.5	Should be able to apply capital budgeting methods.
27	Basic Simulation Lab (EC20APC304)	C216.1	Learn how to use the MATLAB software and know syntax of MATLAB Programming.
		C216.2	Understand how to simulate different types of signals and system response.
		C216.3	Analyze signals using Fourier, Laplace and Z-transforms.
		C216.4	Compute Fourier transform of a given signal and plot its magnitude and phase spectrum.
		C216.5	Verify Sampling theorem, Determine Convolution and Correlation between signals and sequences.
28	Digital Logic Design Lab (EC20APC305)	C217.1	Understand the pin configuration of various digital ICs used in the lab.
		C217.2	Conduct the experiment and verify the properties of various logic circuits.
		C217.3	Design sequential circuits.
		C217.4	Design combinational circuits.
29	Electronic Circuit Analysis & Design Lab (EC20APC306)	C218.1	Understand the characteristics and frequency response of various amplifiers and determine its gain and bandwidth.
		C218.2	Simulate and analyze the performance of negative feedback amplifier circuits, oscillators and Power amplifiers and single tuned amplifiers.
		C218.3	Design a RC and LC oscillator circuits for a given frequency.
		C218.4	Calculate the efficiency of the power amplifier circuits.
		C218.5	Distinguish the operating modes of various Power amplifier circuits.
30	Application Development Using Python (IT20ASC301)	C219.1	Write, Test and Debug Python Programs.
		C219.2	Use Conditionals and Loops for Python Programs.
		C219.3	Construct custom modules and functions to handle different operations.
		C219.4	Implement Object oriented concepts through real time scenarios and handle errors.
		C219.5	Design different shapes and objects using turtle graphics.
31	Biology for Engineers (CH20AMC301)	C21A.1	Analyze about cells and their structure and function. Different types of cells and basics for classification of living Organisms
		C21A.2	Analyze about biomolecules, their structure and function and their role in the living organisms. How biomolecules are useful in Industry.
		C21A.3	Analyze about human physiology
		C21A.4	Analyze about genetic material, DNA, genes and RNA how they replicate, pass and preserve vital information in living Organisms.
		C21A.5	Apply biological Principles in different technologies for the production of medicines and Pharmaceutical molecules through transgenic microbes, plants and animals.
32	Logical Skills For Professionals-II (MA20AMC301)	C21B.1	Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of HCF, LCM Factors and Simplification.
		C21B.2	Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Pipes, Alligation or Mixture.
		C21B.3	Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Table, Bar Graphs and Pie Chart.
		C21B.4	Analyze the techniques in Syllogism.
		C21B.5	Analyze the techniques in Calender, Clocks and Number Series Analogyconcepts
33	(EG20AMC301) Enhancing English Language Skills (Lateral Entry Students only)	C21C.1	Use English language, both written and spoken, competently and correctly.
		C21C.2	Improve comprehension and fluency of speech.
		C21C.3	Hone the communication skills to meet the challenges of their careers successfully.
		C21C.4	Gain confidence in using English in verbal situations.
		C21C.5	Strengthen communication skills in different contexts like formal and informal.
34	Data Structure S Using C (CS20AES401)	C221.1	Analyze the problems using asymptotic notations.
		C221.2	Apply Stack, Queues and linked list to solve different applications.
		C221.3	Demonstrate suitable sorting techniques for the real world problem.
		C221.4	Implement tree structures in different patterns of representation of data.
		C221.5	Analyze the given problem using graph traversal techniques.

S. No.	COURSE NAME	COs	COURSE OUTCOMES
35	Probability Theory and Stochastic Processes (MA20ABS402)	C222.1	Analyze and understand the concepts of Probability.
		C222.2	Analyze the concept of Single Random Variable and evaluate the operations that may be performed on a single Random variable
		C222.3	Analyze the concepts of Multiple Random Variable and evaluate the operations that may be performed on a multiple Random variable.
		C222.4	Analyze the concepts of Random Process and evaluate the Temporal characteristics of Random Processes.
		C222.5	Analyze the concepts of Random Process and evaluate the Temporal characteristics of Random Processes.
36	Analog Communications (EC20APC401)	C223.1	Understand the concepts of various Amplitude, Angle and Pulse Modulation schemes.
		C223.2	Apply the concepts to solve problems in Analog and pulse modulation schemes
		C223.3	Analysis of Analog communication system in the presence of noise.
		C223.4	Compare and contrast design issues, advantages, disadvantages and limitations of various modulation schemes in Analog communication systems.
		C223.5	Solve basic communication problems & calculate information rate and channel capacity of a discrete communication channel.
37	Electromagnetic Waves and Transmission Lines (EC20APC402)	C224.1	Understanding the basic laws and applications of electromagnetic fields.
		C224.2	Evaluate the problems related to electromagnetic fields.
		C224.3	Analyze Maxwell equations for static and time varying fields.
		C224.4	Analyze electric and magnetic fields at the interface of different media.
		C224.5	Evaluate electric and magnetic fields and calculates different angles.
		C224.6	Evaluate transmission lines with equivalent circuit and their characteristics with various lengths.
38	Linear & Digital Integrated Circuits and Applications (EC20APC403)	C225.1	List out the characteristics of Linear and Digital ICs.
		C225.2	Discuss the various applications of linear & Digital Ics.
		C225.3	Solve the application based problems related to linear and digital Ics.
		C225.4	Analyze various applications based circuits of linear and digital ICs.
		C225.5	Design the circuits using either linear ICs or Digital ICs from the given specifications
		C225.6	Develop digital circuits using HDL.
39	Analog Communications Laboratory (EC20APC404)	C226.1	Understand different analog modulation techniques &Radio receiver characteristics.
		C226.2	Analyze different analog modulation techniques.
		C226.3	Design and implement different modulation and demodulation techniques.
		C226.4	Observe the performance of system by plotting graphs & Measure radio receiver characteristics.
		C226.5	Simulate all digital modulation and demodulation techniques.
40	Data Structures Using C Lab (CS20AES402)	C227.1	Demonstrate the concept of Recursion for solving a problem.
		C227.2	Choose and implement linear data structure to solve problems.
		C227.3	Develop programs for searching and sorting algorithms.
		C227.4	Select and implement suitable non linear data structure for solving a problem.
41	Linear & Digital Integrated Circuits and Applications Lab (EC20APC405)	C228.1	Understand the pin configuration of each linear/ digital IC and its functional diagram.
		C228.2	Conduct the experiment and obtain the expected results.
		C228.3	Analyze the given circuit/designed circuit and verify the practical observations with the analyzed results.
		C228.4	Design the circuits for the given specifications using linear and digital ICs.
		C228.5	Acquaintance with lab equipment about the operation and its use.
42	Soft Skills (EG20ASO401)	C229.1	Memorize various elements of effective communicative skills.
		C229.2	Interpret people at the emotional level through emotional intelligence
		C229.3	Apply critical thinking skills in problem solving.
		C229.4	Analyze the needs of an organization for team building.
		C229.5	Judge the situation and take necessary decisions as a leader.
43	NSS/Yoga/Cultural/ Games and Sports (SH20AMC401)	C22A.1	Develop social and work-life skills as well as personal and emotional well being.

S. No.	COURSE NAME	COs	COURSE OUTCOMES
44	Universal Human Values (BA20AMC201)	C22B.1	Understanding the value of education to become more aware of themselves, and their surroundings (family, society, nature).
		C22B.2	Utilize the concepts of human being-harmony in myself become more responsible in life, and in handling problems with sustainable.
		C22B.3	Understanding the concepts of society-harmony in human for better critical ability.
		C22B.4	Understanding the human values, human relationship and human society to become sensitive to their commitment.
		C22B.5	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
45	Engineering Mathematics (Lateral Entry Students only) (MA20AMC401)	C22C.1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications.
		C22C.2	Utilize mean value theorems to real life problems.
		C22C.3	Solve the differential equations related to various engineering fields.
		C22C.4	Apply multiple integrals to find the area and volumes for different functions.
		C22C.5	Estimate the work done against a field, circulation and flux using vector calculus.
46	Integrated Circuits and Applications (19A04501T)	C311.1	Intrepret DC and AC characteristics of operational amplifiers & Op amp parameters.
		C311.2	Make use of Op-Amps to design circuits for various applications such as Amplifiers, Active filters, Oscillators.
		C311.3	Analyze Op-Amp based non linear applications such as Comparators, Waveform generators.
		C311.4	Apply opamp basics to study and Compare different types of A/D and D/A Converter circuits.
		C311.5	Design various multi-vibrator circuits using IC 555 timer and analyse special purpose ICs like PLL,VCO and voltage regulators
47	Antennas and Wave Propagation (19A04502)	C312.1	Discuss the various characteristics with the use of basic antenna.
		C312.2	Discuss the field components of various dipole antennas and Analyze radiation pattern of various antenna arrays with some practical antennas.
		C312.3	Demonstrate the basic principles of Aperture and Lens Antennas with feeding mechanism.
		C312.4	Demonstrate the basic principles of antennas which are operated in microwave Frequency range.
		C312.5	Evaluate the antenna parameters in antenna measurements.
		C312.6	Illustrate problems on inosphere propagations and discuss wave characteristics in different frequency ranges of propagations.
48	English Language Skills (19A52601T)	C313.1	Facilitate active listening to enable inferential learning through expert lectures and talks.
		C313.2	Impart critical reading strategies for comprehension of complex texts.
		C313.3	Provide training and opportunities to develop fluencyin English through participation informal group discussions and presentations using audio-visual aids.
		C313.4	Demonstrate good writing skills for effective paraphrasing,argumentative essays and formal correspondence.
		C313.5	Encourage use of a wide range of grammatical structures and vocabulary in speech and writing
49	Digital Communication (19A04503T)	C314.1	Classify different source coding systems.
		C314.2	Analyze the concepts of baseband transmission for PAM.
		C314.3	Determine signal space analysis for Correlator.
		C314.4	Analyze the concepts of passband data transmission techniques for BPSK,QPSK,BFSK.
		C314.5	Evaluate various channel coding techniques.
50	Data Communication and Networks (19A04504a)	C315.1	Compare different network architectures and reference models.
		C315.2	Select the approriate technology for data transmission based on the requirement.
		C315.3	Analyze different flow and error control protocols.
		C315.4	Configure simple networks and assign IP addresses to hosts.
		C315.5	Apply the concepts of different application layer protocols.
51	Computer Applications in Food Industry (19A27506b)	C316.1	Analyze the importance of Computerization and IT applications in food industries and need for development of Computer operating environment and information system for various types of food industries.
		C316.2	Learn the basic concepts of 'C'.
		C316.3	Analyze the operation of branching and looping statements.
		C316.4	Use the concept of functions,Arrays,strings.
		C316.5	Apply the Concept of Pointers, Structures,Unions, data structures, linked lists

S. No.	COURSE NAME	COs	COURSE OUTCOMES
52	Integrated Circuits and Applications Lab (19A04501P)	C317.1	**Simulate and Analyze** the working of linear and non linear applications of opamp-741/TL082.
		C317.2	**Design and simulate** astable and monostable multivibrator using IC555 timer.
		C317.3	**Simulate and Verify** the working of ADC and DAC
		C317.4	**Study** the opration and applications of Special purpose ICs PLL-IC 565, IC566.
		C317.5	**Design and simulate** fixed and variable voltage regulator using ICs 723,7805/7809.
53	English Language Skills Lab (19A52601P)	C318.1	To expose the students to variety of self instructional, learner friendly modes of language learning.
		C318.2	To help the students cultivate the habit of reading passages from the computer monitor. Thus providing them with the required facility to face computer based competitive exams like GRE, TOEFL, and GMAT etc
		C318.3	To enable them to learn better pronunciation through stress, intonation and rhythm.
		C318.4	To train them to use language effectively to face interviews, group discussions, public speaking.
54	Digital Communications Lab (19A04503P)	C319.1	**Analyze** different Source Coding techniques using hardware implementation.
		C319.2	**Analyze** Source Coding techniques using MATLAB.
		C319.3	**Analyze** the different Passband data transmission techniques using hardware implementation..
		C319.4	**Analyze** passband data transmission using MATLAB.
55	Research Methodology (19A99601)	C31A.1	**Understand** the basic concepts of research and its methodologies
		C31A.2	**Analyze** the research problem and apply appropriate sampling method for data collection.
		C31A.3	**Apply** different methods for analysis purpose.
		C31A.4	**Analyze** various types of testing tools used in research.
		C31A.5	**Design** a research paper by following research ethics.
56	Socially Relevant Project (19A04507)	C31B.1	**Identify** the problem statement by observing the problems in the society, for which electronics engineers can propose a solution.
		C31B.2	**Develop** the design methodolgy for implementing the chosen project.
		C31B.3	**Apply** appropriate modern tools for implementing the project work.
		C31B.4	**Evaluate** application of project work with appropriate societal consideration.
		C31B.5	**Develop** presentation and interpersonal communication skills through presentations and documentation.
57	Microprocessors and Microcontrollers (19A04601T)	C321.1	**Explain** the architecture, interrupts and addressing modes of 8085 and 8086 microprocessors.
		C321.2	**Develop** Assembly Language Programs for various problems using 8086.
		C321.3	**Interface** 8086 with different peripheral devices.
		C321.4	**Deseribe** architecture and features of 8051 microcontroller and develop Assembly Language Programs to perform various operations using 8051.
		C321.5	**Explain** the architecture, instruction set and addressing modes of ARM Cortex M0+ Processor.
58	Digital Signal Processing (19A04602T)	C322.1	**Analyze** the concept of DFT & FFT Algorithms.
		C322.2	**Design** IIR filters using various techniques & construct different forms of IIR filter realizations.
		C322.3	**Design** FIR filters using various techniques & construct different forms of FIR filter realizations .
		C322.4	**Describe** the Architecture details & instruction sets of programmable DSP.
		C322.5	**Implement** the signal processing algorithms in DSP.
59	Digital System Design through VHDL (19A04603)	C323.1	**Understand** the architecture of FPGAs, tools used in modelling of digital design and modelling styles in VHDL.
		C323.2	**Implement** various arithmetic and logical operations in digital design using VHDL.
		C323.3	**Design** various combinational logic circuits and analyze its operation; and implement various memory and data storage elements using VHDL.
		C323.4	**Design** various sequential logic circuits and analyze its operation using VHDL.
		C323.5	**Design** complex digital CPU, vending machine and washing machines etc. using VHDL and analyze the case studies.
60	Electrical Measurement and Electronic Instruments (19A04605d)	C324.1	**Evaluate** some important measurement parameters of electrical and electronic instruments.
		C324.2	**Explain** the basic working principle of different measuring meters.
		C324.3	**Analyze** performance of various electric and electronic instruments.
		C324.4	**Apply** the knowledge of CRO measuring instrument in real time measurements
		C324.5	**Explain** the basic working principle of different types of Transducers.

S. No.	COURSE NAME	COs	COURSE OUTCOMES
61	Soft Skills (19A52604a)	C325.1	**Develop** awareness on the relevance and importance of soft skills.
		C325.2	**Recognize** the importance of verbal and non verbal skills.
		C325.3	**Develop** the interpersonal and intrapersonal skills.
		C325.4	**Apply** the knowledge in setting the SMART goals and achieve the set goals.
		C325.5	**Create** trust among people and develop employability skills.
62	Entrepreneurship & Incubation (19A52602a)	C326.1	**Apply** the concept of Entrepreneurship and challenges in the world of competition.
		C326.2	**Develop** Knowledge in generating ideas for New Ventures.
		C326.3	**Analyze** various sources of finance and subsidies to entrepreneur/women Entrepreneurs.
		C326.4	**Evaluate** the role of central government and state government in promoting Entrepreneurship.
		C326.5	**Create and design** business plan structure through incubations.
63	Digital Signal Processing Lab (19A04602P)	C327.1	**Develop** various DSP Algorithms using MATLAB Software.
		C327.2	**Evaluate** Frequency response Characteristics of digital FIR & IIR filters.
		C327.3	**Implement** basic signal processing algorithms such as convolution, difference equation implementation and apply them in the construction of FIR and IIR filters.
		C327.4	**Design** various analog filters.
		C327.5	**Analyze** DSP algorithms using both fixed and floating point processors.
64	Microprocessors and Microcontrollers Lab (19A04601P)	C328.1	**Write** Assembly Language Programs for 8086, 8051 and execute programs using TASM/MASM Software.
		C328.2	**Analyze** the program execution process step by step.
		C328.3	**Interface** different peripheral devices with 8051 microcontroller.
		C328.4	**Execute** programs using Keil MDK-ARM tool
		C328.5	**Design** some specific real time applications and implement the same.
65	Socially Relevant Project (19A04606)	C329.1	**Identify** the problem statement by observing the problems in the society, for which electronics engineers can propose a solution.
		C329.2	**Develop** the design methodolgy for implementing the chosen project.
		C329.3	**Apply** appropriate modern tools for implementing the project work.
		C329.4	**Evaluate** application of project work with appropriate societal consideration.
		C329.5	**Develop** presentation and interpersonal communication skills through presentations and documentation.
66	Constitution of India (19A99501)	C32A.1	**Analyze** historical background of the constitution making and its importance for building a democratic India.
		C32A.2	**Discriminate** the functioning of three wings of the government ie., executive, legislative and judiciary.
		C32A.3	**Analyze** the decentralization of power between central, state and local self-government.
		C32A.4	**Explain** the duties and powers of local self-government and become good citizen of India.
		C32A.5	**Apply** the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.
67	Optical Fiber Communication (15A04701)	C411.1	Demonstrate optical FiberTransmission links modes and structures.
		C411.2	Analyze the different losses which causes signal degradation optical Fibers.
		C411.3	Assess the Characteristics of Optical sources detectors.
		C411.4	Compare various performance parameters of optical fiber receivers.
		C411.5	Compare Analog and Digital Systems in optical fiber communication.
52	Embedded Systems (15A04702)	C412.1	Demonstrate the Concepts on Embedded System Memories and Programming Languages
		C412.2	Demonstrate the Concept of Embedded System Processors.
		C412.3	Analyze the Development of Embedded System Design.
		C412.4	Demonstrate the Fundamentals of Embedded System Microcontrollers.
		C412.5	Apply the Communication Protocols using TM4C and TIVA microcontroller.

S. No.	COURSE NAME	COs	COURSE OUTCOMES
53	Microwave Engineering (15A04703)	C413.1	Demonstrate the concepts of Fields and Networks working principles of specific microwave devices.
		C413.2	Compare microwave components using S-parameters.
		C413.3	Apply concept of microwave tube for a given set of specifications.
		C413.4	Demonstrate concept of microwave solid state devices.
		C413.5	Measure the effect of microwaves on human body, impact of the professional engineering solutions on environment and society and the consequent responsibilities relevant to an EC engineer.
54	Data Communications and Networking (15A04704)	C414.1	Illustrate OSI and TCP/IP Models in data communication networks.
		C414.2	Classify various switching and transmission media in networks.
		C414.3	Analyze various multiple access protocols and Ethernet standards.
		C414.4	Model the various types of the networks.
		C414.5	Assess the various services of Transport Layer Protocol & Network Security Issues.
55	Radar Systems (15A04705)	C415.1	Understand of the performance of basic radar system w r t varoius parameters through the radar funadamentals.
		C415.2	Describe the working of various Doppler Radar systems and compare with pulase radar.
		C415.3	Catogorise MTI Radars and analyze its performance in comparison with doppler radar.
		C415.4	Analyze Tracking radar and its performance and evaluate the parameters.
		C415.5	Illustrate the design requirements of radar receivers and elements of radar system like Duplexer,Phased array antenna etc.,
56	Digital Image Processing (15A04708)	C416.1	Understand fundamental steps in digital image processing and apply engineering mathematics in processing of digital image
		C416.2	Compute 2D mathematical transormation properties w r t digital image processing.
		C416.3	Analyze different image enhancement techniques in spatial and frquency domain.
		C416.4	Describe various mathematical techniques and algorithms in image restoration and segmentation.
		C416.5	Illustrate various techniques and algorithms to perform image compression.
57	Microwave & Optical Communication Laboratory (15A04711)	C417.1	Analyze the concepts of transmission and reception of microwave signals.
		C417.2	Analyze the characteristics of Microwave components.
		C417.3	Analyze the performance of LED and Laser Diode using optical fiber link.
		C417.4	Analyze the performance of analog and digital optical fiber link.
58	VLSI & Embedded Systems Laboratory (15A04712)	C418.1	Examine VHDL/Verilog HDL source code for various digital integrated circuits in Xilinx platform.
		C418.2	Evaluate the simulation results using necessary synthesizer.
		C418.3	Develop source code for different applications using TM4C processor and perform the compilation.
		C418.4	Create the required binary file which can be dumped into the controller.
		C418.5	Analyze the logic outputs with the necessary hardware.
59	Low Power VLSI Circuits And Systems (15A04802)	C421.1	Interpret the concepts of velocity saturation, Impact Ionization and hot electron effect
		C421.2	Design CMOS inverters with specified noise margin and propagation delay.
		C421.3	Evaluate the power dissipation of various digital circuits.
		C421.4	Critique the realization of clock-gated FSMs.
		C421.5	Analyze the dependence of leakage power dissipation of CMOS circuits on the thresholdvoltage of the MOS transistors.
60	RF Integrated Circuits (15A04804)	C422.1	Describe basic RF architectures and to Analyze RLC circuits.
		C422.2	Evaluate Characterstics parameters of Transimission lines & RF amplifiers using tools like smith chart.
		C422.3	Classify different types of Noises and Determine related Noise parameters with respect to RF Systems.
		C422.4	Analyze Performance of RF power Amplifiers,Oscillators,PLL.
		C422.5	Summarize frequency synthesis of RF Integrated circuits and Elaborate architectures of GSM,CDMA,UMTS.

S. No.	COURSE NAME	COs	COURSE OUTCOMES
61	Technical Seminar (15A04806)	C423.1	Interpret the recent technological updations.
		C423.2	Prepare Presentation and seminar report on the specified technical topic.
		C423.3	Develop knowledge, presentation and communication skills.
		C423.4	Defend or convince the audience during viva process.
62	Project (15A04807)	C424.1	Identify the socially relevant problems and define the problem statement.
		C424.2	Analyze and categorize executable project modules by applying acquired knowledge and skills with due consideration of constraints.
		C424.3	Use efficient resources/IT tools for designing project modules.
		C424.4	Combine all the modules through effective team work after efficient testing and simulation.
		C424.5	Improve the team building, communication and management skills.
		C424.6	Elaborate the completed task and demonstrate working of the model/module in most convincing manner.
		C424.7	Compile the project report with appropriate writing skills.
		C424.8	Predict the consequences of developed model in terms of safety, health hazards and ensure ethical values.
		C424.9	Verify the scope of transforming model/module into marketable product through proper financial management.

HOD ECE

HEAD OF THE DEPARTMENT
ELECTRONICS & COMMUNICATION ENGINEERING
S.V. COLLEGE OF ENGINEERING
KARAKAMBADI ROAD, TIRUPATI-517 507.

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

I B.Tech – I Sem

S.No	CourseNo	CourseName	Category	L-T-P	Credits
1.	MA20ABS101	Linear Algebra and Calculus	BS	3-0-0	3
2.	CH20ABS103	Chemistry	BS	3-0-0	3
3.	CS20AES101	Problem Solving using C	ES	3-0-0	3
4.	EE20AES101	Basic Electrical& Electronics Engineering	ES	3-0-0	3
5.	ME20AES101	EngineeringWorkshop	ES	0-0-3	1.5
6.	CS20AES103	ITWorkshop	ES	0-0-3	1.5
7.	CH20ABS104	ChemistryLab	BS	0-0-3	1.5
8.	CS20AES102	ProblemSolvingusingCLab	ES	0-0-3	1.5
9.	EE20AES102	BasicElectrical&Electronics EngineeringLab	ES	0-0-2	1.5
10.	EG20AMC101	Speech&OralCommunication	MC	2-0-0	0
				Total	**19.5**

COURSE OUTCOMES

Sl.No	Subject with code	Course Outcomes
1	**LINEAR ALGEBRA & CALCULUS (MA20ABS101)**	Develop the use of matrix algebra techniques that is needed by engineers for practical applications
		Utilize mean value theorems to real life problems
		Familiarize with functions of several variables which are useful in optimization
		Apply multiple integrals to find the area and volumes for different functions
		Analyze the concepts of Beta and Gamma special function for different functions
2	**CHEMISTRY (CH20ABS103)**	Estimate the amount of hardness and DO present in water.
		Compare the materials of construction for battery and electrochemical sensors.
		Explain the preparation, properties,and applications of thermoplastics &thermosetting, elastomers & conducting polymers.
		Explain the principles of spectrometry.
		Apply the principle of Band diagrams in application of conductors and semiconductors.
3	**PROBLEM SOLVING USING C (CS20AES101)**	Solve computational problems
		Select the features of C language appropriate for solving a problem
		Design computer programs for real world problems
		Organize the data which is more appropriated for solving a problem
4	**BASIC ELECTRICAL & ELECTRONICS ENGINEERING Part A: BASIC ELECTRICAL ENGINEERING (EE20AES101)**	Apply concepts of KVL/KCL in solving DC circuits
		Choose correct rating of a transformer for a specific application
		Illustrate working principles of induction motor - DC Motor
		Identify type of electrical machine based on their operation.
		Describe working principles of protection devices used in electrical circuits.
	BASIC ELECTRICAL & ELECTRONICS ENGINEERING Part B: ELECTRONICS ENGINEERING (EE20AES101)	Explain the theory, construction, and operation of electronic devices.
		Apply the concept of science and mathematics to explain the working of diodes and its applications, working of transistor and to solve the simple problems based on the applications.
		Analyze small signal amplifier circuits to find the amplifier parameters
		Design small signal amplifiers using proper biasing circuits to fix up proper Q point.
		Distinguish features of different active devices including Microprocessors.
5	**EngineeringWorkshop ME20AES101**	Identify tools, work material, measuring instruments useful for domestic applications
		Apply wood working skills in real world applications
		Build different parts with metal sheets in real world applications.
		Apply fitting operations in various applications for good strength.

		Analyze different types of basic electric circuit connections.
		Demonstrate soldering and brazing in joining circuits.
		Make moulds for sand casting using standard equipment
		Develop different weld joints for various metals
		Inspect various parts of machine components.
		Make plastic components using proper raw material.
6	**IT Workshop (CS20AES103)**	Identify the Internal parts of computers and Generation of Computers.
		Assemble and disassemble a computer from its parts and prepare the computer ready to use
		Installation process of different types Operating system for a computer by their own.
		Interconnect two or more computers for information sharing
		Access the Internet and browse it for required information
		Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX
		Prepare slide presentation using the presentation tool.
7	**CHEMISTRY LAB (CH20ABS104)**	Determine the cell constant and conductance of solutions
		Prepare advanced polymer- Bakelite.
		Measure the strength of an acid present in secondary batteries.
		Analyse the IR of some organic compounds
		Estimate the amount of dissolved oxygen in water
8	**PROBLEM SOLVING USING C LAB (CS20AES102)**	Build algorithm and flowchart for simple problems
		Use suitable control structures to solve problems
		Use suitable iterative statements, arrays and modular programming to solve the problems
		Implement Programs using pointers and String handling Functions
		Develop code for complex applications using structures, unions and file handling features
9	**(EE20AES102) BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB Part A: Electrical Engineering Lab**	Verify Kirchoff's Laws & Superposition theorem
		Perform testing on AC and DC Machines.
		Study I – V Characteristics of PV Cell
	Part B: Electronics Engineering Lab	Learn the characteristics of basic electronic devices like PN junction diode, Zener diode & BJT
		Construct the given circuit in the lab
		Analyze the application of diode as rectifiers, clippers and clampers and other circuits
		Design simple electronic circuits and verify its functioning
10	**SPEECH AND ORAL COMMUNICATION (EG20AMC101)**	Improve the neutral accent and be free from mother tongue influence
		Hypothesizing small talks on general topics and learn critiquing skills by participating in Conversations
		Applying Vocabulary and using it in their day-to-day life
		Understanding and mastering in verbal and non-verbal communication

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

I B.Tech – II Sem

S.No	CourseNo	CourseName	Category	L-T-P/D	Credits
1.	MA20ABS201	Differential Equations and Vector Calculus	BS	3-0-0	3
2.	PH20ABS103	Applied Physics	BS	3-0-0	3
3.	EG20AHS101	Communicative English	HS	3-0-0	3
4.	CS20AES201	Data Structures	ES	3-0-0	3
5.	ME20AES102	Engineering Drawing	ES	1-0-0/2	2
6.	ME20AES103	Engineering Graphics Lab	ES	0-0-2	1
7.	EG20AHS102	Communicative English Lab	HS	0-0-3	1.5
8.	PH20ABS104	Applied Physics Lab	BS	0-0-3	1.5
9.	CS20AES202	Data Structures Lab	ES	0-0-3	1.5
10.	BA20AMC201	Universal Human Values	MC	3-0-0	0
11	BA20AHS201	Mandatory course (AICTE Suggested): Universal Human Values	HS	3-0-0	*3
12.	MA20AMC101	Logical Skills for Professionals – I	MC	2-0-0	0
				Total	**19.5**

COURSE OUTCOMES

Sl.No	Subject with code	Course Outcomes
1	**DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS (MA20ABS201)**	Solve the differential equations related to various engineering fields
		Solve the linear differential equations of higher order related to various engineering fields.
		Identify solution methods for partial differential equations that model physical processes.
		Interpret the physical meaning of different operators such as gradient, curl and divergence
		Estimate the work done against a field, circulation and flux using vector calculus
2	**APPLIED PHYSICS (PH20ABS103)**	Apply the different realms of physics and their applications in both scientific and technological systems through physical optics
		understand the mechanisms of emission of light, the use of lasers as light sources for low and high energy applications
		Understands the response of dielectric and magnetic materials to the applied electric and magnetic fields
		Apply the quantum mechanical picture of subatomic world along with the discrepancies between the classical estimates and laboratory observations of electron transportation phenomena by free electron theory and band theory
		Elaborate the physical properties exhibited by materials through the understanding of properties of semiconductors and superconductors
3	**COMMUNICATIVE ENGLISH (EG20AHS101)**	Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English
		Apply grammatical structures to formulate sentences and correct word forms
		Analyze discourse markers to speak clearly on a specific topic in informal discussions
		Evaluate reading/listening texts and to write summaries based on global comprehension of these texts.
		Create a coherent paragraph interpreting a figure/graph/chart/table
4	**DATA STRUCTURES (CS20AES201)**	Analyze the problems using asymptotic notations
		Apply Stack, Queues and linked list to solve different applications
		Demonstrate suitable sorting techniques for the real world problem
		Implement tree structures in different patterns of representation of data.
		Analyze the given problem using graph traversal techniques
5	**ENGINEERING DRAWING (ME20AES102)**	Draw basic geometrical constructions, curves used in engineering practices
		Understand the concept of projection and acquire visualization skills, projection of points, Lines and Planes

		Illustrate the projections of solids graphically.
		Draw and explore the sectional views of right regular solids
		Draw the development of surfaces of solids
6	**ENGINEERING GRAPHICS LAB (ME20AES103)**	Draw the basic views related to projections of Lines, Planes
		Draw the basic views related to projections of Planes
		Illustrate orthographic views of simple objects
		Illustrate isometric projections of simple solids
		Interpret and comprehend with drafting packages for engineering practice
7	**COMMUNICATIVE ENGLISH LAB (EG20AHS102)**	Develop to handle and excel in a variety of self-instructional, learner-friendly modes of language learning
		Develop to employ better stress and intonation patterns and utter English sounds correctly
		Develop to avoid the impact of mother tongue in English and neutralize their accent
		Develop to participate with skill and confidence in Group Discussions, Interviews and Public Speaking
		Utilize the technical skills to prepare resume, report-writing, and format-making etc
8	**APPLIED PHYSICS LAB (PH20ABS104)**	Utilize optical instruments like microscope and spectrometer
		Determine thickness of a hair/paper with the concept of interference
		Estimate the wavelength of different colors using diffraction grating and resolving power
		Organize the intensity of the magnetic field of circular coil carrying current with distance
		Evaluate the acceptance angle of an optical fiber and numerical aperture
		Determine the resistivity of the given semiconductor using four probe method
		Identify the type of semiconductor i.e., n-type or p-type using hall effect
		Determine the band gap of a given semiconductor
9	**DATA STRUCTURES LAB (CS20AES202)**	Demonstrate the concept of Recursion for solving a problem
		Choose and implement linear data structure to solve problems
		Develop programs for searching and sorting algorithms
		Select and implement suitable nonlinear data structure for solving a problem
10	**UNIVERSAL HUMAN VALUES (BA20AHS201)**	Understanding the value of education to become more aware of themselves, and their surroundings (family, society, nature).
		Utilize the concepts of human being-harmony in myself become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind
		Understanding the concepts of society-harmony in human for better critical ability
		Understanding the human values, human relationship and

		human society to become sensitive to their commitment.
		Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction
11	**LOGICAL SKILLS FOR PROFESSIONALS –I (MA20AMC101)**	Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Averages - Percentages - Ratio
		Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Partnership - Simple Interest and Compound Interest and time and distance
		Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of time ad work, problems on trains and Boats and streams
		Analyze the techniques in series, coding and decoding and blood relations
		Analyze the techniques in directions, problems on ages and analogy

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

II B.Tech – I Sem

S. No	Course No	Course Name	Category	L-T-P	Credits
1	MA20ABS303	Discrete Mathematics & Graph Theory	BS	3-0-0	3
2	EC20AES301	Digital Electronics & Microprocessors	ES	3-0-0	3
3	CS20APC305	Software Engineering	PC	3-0-0	3
4	CS20APC303	Database Management Systems	PC	3-0-0	3
5	IT20APC301	Python Programming	PC	3-0-0	3
6	EC20AES302	Digital Electronics & Microprocessors Lab	ES	0-0-3	1.5
7	CS20APC304	Database Management Systems Lab	PC	0-0-3	1.5
8	IT20APC302	Python Programming Lab	PC	0-0-3	1.5
9	AM20ASC301	**Skill oriented course-I** Linux Administration	SC	1-0-2	2
10	CH20AMC201	**Mandatory non-credit course-II** Environmental Science	MC	2-0-0	0
11	EG20AMC302	Enhancing English Language Skills **(Lateral Entry Students Only)**	MC	2-0-0	0
12	BA20AHS201	Mandatory course (AICTE Suggested): Universal Human Values**(Lateral Entry Students Only)**	HS	3-0-0	*3
				Total	**21.5**

COURSE OUTCOMES

Sl.No	Subject with code	Course Outcomes
1	**DISCRETE MATHEMATICS AND GRAPH THEORY (MA20ABS303)**	Apply mathematical concepts and logical reasoning to solve problems in different fields of Computer science and information technology
		Apply the properties of Set theory to find Equivalence and Partial Ordering relations and HasseDiagrams for different functions
		Analyse the properties of Algebraic Structures to find the given sets are Semi group, Monoids and Groups
		Analyse the concepts of Generating and Recurrence relations for solving Homogeneous and In-Homogeneous equations
		Investigate the graphs are Isomorphic Graphs, Euler and Hamilton Graphs
2	**DIGITAL ELECTRONICS & MICROPROCESSORS (EC20AES301)**	To understand the concept of Logic circuits and analyze various Boolean algebra functions
		To understand the concept of Combinational Logic and Sequential Logic Circuits
		To create combinational circuits using PLD's
		To understand the concepts of 8085, 8086 Microprocessor and 8051 Microcontroller
		Apply knowledge and demonstrate programming proficiency using various addressing modes and instruction sets of 8086 & 8051
3	**SOFTWARE ENGINEERING (CS20APC305)**	Obtain basic software life cycle activity skills
		Design software requirements specification for given problems
		Implement structure, object oriented analysis and design for given problems
		Design test cases for given problems
		Apply quality management concepts at the application level
4	**DATABASE MANAGEMENT SYSTEMS (CS20APC303)**	Design a database for a real world information system
		Define transactions which preserve the integrity of the database
		Generate tables for a data base
		Organize the data to prevent redundancy
		Pose queries to retrieve the information from database
5	**PYTHON PROGRAMMING (IT20APC301)**	Apply the features of Python language in various real applications
		Select appropriate core data structure of Python for solving a problem
		Design object-oriented programs using Python for solving real-world problems
		Apply modularity to programs
		Design graphics using turtle module
6	**DIGITAL ELECTRONICS &**	Analyze the concepts of Logic Gates and Boolean

	MICROPROCESSORSLAB (EC20AES302)	functions
		Analyze Combinational Logic and Sequential Logic Circuits
		Analyze the logic circuits using Programmable Logic Devices
		Apply knowledge and demonstrate programming proficiency using various addressing modes and instruction sets of 8086 & 8051
7	**DATABASE MANAGEMENT SYSTEMS LAB (CS20APC304)**	Work with the concepts of DDL, DML, DCL Commands
		Design of databases for real life systems using Oracle
		Learning of SQL queries on the real-life systems
		Execution of PL/SQL programs for different problems
		Implementation of procedure, function, trigger and cursor concepts in PL/SQL
8	**PYTHON PROGRAMMING LAB (IT20APC302)**	Design solutions to mathematical problems
		Organize the data for solving the problem
		Develop Python programs for numerical and text-based problems
		Select appropriate programming construct for solving the problem
		Illustrate object-oriented concepts
9	**LINUX ADMINISTRATION (AM20ASC301)**	Understand shell script to create files and handle text documents.
		Analyze various methodologies in Linux administration
		Implementation of IPC through shell programming in the Linux environment
		Create child processes and background processes
10	**ENVIRONMENTAL SCIENCE (CH20AMC201)**	Understanding multidisciplinary nature of environmental studies and various renewable and non renewable resources
		Understand flow and bio-geo- chemical cycles and ecological pyramids
		Understand various causes of pollution and solid waste management and related preventive measures
		Apply the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation
		Apply the concepts of population explosion, value education and welfare programmes in society
11	**ENHANCING ENGLISH LANGUAGE SKILLS (EG20AMC302)**	Use English language, both written and spoken, competently and correctly
		Improve comprehension and fluency of speech
		Hone the communication skills to meet the challenges of their careers successfully
		Gain confidence in using English in verbal situations
		Strengthen communication skills in different contexts like formal and informal

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

II B.Tech – II Sem

S. No	Course No	Course Name	Category	L-T-P	Credits
1	MA20ABS401	Numerical Methods, Probability and Statistics	BS	3-0-0	3
2	CS20APC401	Object Oriented Programming Through Java	PC	3-0-0	3
3	CS20APC301	Computer Organization and Architecture	PC	3-0-0	3
4	AM20APC301	Design and Analysis of Algorithms	PC	3-0-0	3
5	BA20AHS301	**Humanities Elective-I** Managerial Economics and Financial Analysis	HS	3-0-0	3
	BA20AHS302	Business Environment			
	BA20AHS303	Organizational Behavior			
6	CS20APC402	Object Oriented Programming Through Java Lab	PC	0-0-3	1.5
7	CS20APC302	Computer Organization and Architecture Lab	PC	0-0-3	1.5
8	AM20APC302	Algorithms Lab	PC	0-0-3	1.5
9	IT20ASC401	**Skill Oriented Course-II** Exploratory Data Analysis With R	SC	1-0-2	2
10	CS20AMC401	**Mandatory non-credit course-III** Design Thinking for Innovation	MC	2-0-0	0
11	SH20AAC401	NSS/YOGA/Cultural Activities/Sports	AC	0-0-2	0
12	MA20AMC401	Engineering Mathematics (Lateral Entry Students Only)	MC	2-0-0	0.0
				Total	**21.5**
Community Service Project – After the end of IV Semester – 4 Weeks – 1.5 Credits					
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				0-0-2	0

COURSE OUTCOMES

Sl.No	Subject with code	Course Outcomes
1	**NUMERICAL METHODS, PROBABILITY AND STATISTICS (MA20ABS401)**	Apply different methods to find roots of algebraic and transcendental equations
		Apply different methods to find approximate solution of ordinary differential equations and Numerical Integration
		Analyse the concepts of probability and their applications
		Apply discrete and continuous probability distributions in practical problems
		Analyse the statistical inferential methods based on small and large sampling tests
2	**OBJECT ORIENTED PROGRAMMING THROUGH JAVA (CS20APC401)**	To solve real world problems using OOP techniques
		To apply code reusability through inheritance, packages and interfaces
		To solve problems using java collection framework and I/O classes
		To develop applications by using parallel streams for better performance
		To build GUIs and handle events generated by user interactions
3	**COMPUTER ORGANIZATION AND ARCHITECTURE (CS20APC301)**	Understand the computer organization concepts related to design of modern processors, memories and I/Os
		Identify the hardware requirements for cache memory and virtual memory
		Understand the importance and tradeoffs of different types of memories
		Design algorithms to exploit pipelining and multiprocessors
		Identify pipeline hazards and possible solutions to those hazards
4	**DESIGN AND ANALYSIS OF ALGORITHMS (AM20APC301)**	Analyze the complexity of the algorithms
		Make use of various design techniques like divide and conquer, greedy, dynamic programming, backtracking, branch and bound to solve the problems
		Identify and analyze criteria and specifications appropriate to new problems, and choose the appropriate algorithmic design technique for their solution
		Able to prove that a certain problem is NP-Complete
5	**OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB (CS20APC402)**	Recognize the Java programming environment
		Select appropriate programming construct to solve a problem
		Develop efficient programs using multithreading
		Design reliable programs using Java exception handling features
		Extend the programming functionality supported by Java
6	**Computer Organization and Architecture Lab (CS20APC302)**	Understand various components of computer system
		Design adder circuit using basic gates
		Analyze arithmetic operation on binary

		Analyze the behavior of logic gates
7	**ALGORITHMS LAB (AM20APC302)**	Apply the Divide and Conquer strategy to solve searching, sorting problems
		Analyze the efficiency of Greedy and Dynamic Programming design techniques to solve the optimization problems
		Relate Back tracking technique for solving constraint satisfaction problems
8	**EXPLORATORY DATA ANALYSIS WITH R (IT20ASC401)**	Install and use R for simple programming tasks
		Extract data from files and other sources and perform various data manipulation tasks on them
		Explore statistical functions in R
		Use R Graphics and Tables to visualize results of various statistical operations on data
		Apply the knowledge of R gained to data Analytics for real-life applications
9	**DESIGN THINKING FOR INNOVATION (CS20AMC401)**	Generate and develop different design ideas
		Appreciate the innovation and benefits of design thinking
		Experience the design thinking process in IT and agile software development
		Understand design techniques related to variety of software services
10	**ENGINEERING MATHEMATICS (MA20AMC401)**	Develop the use of matrix algebra techniques that is needed by engineers for practical applications
		Utilize mean value theorems to real life problems
		Solve the differential equations related to various engineering fields
		Apply multiple integrals to find the area and volumes for different functions
		Estimate the work done against a field, circulation and flux using vector calculus

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

III B.Tech – I Sem

IIIB. Tech-I Semester(Theory-5,lab–2,SOC-1MC-3)					
S. No	**Course No**	**Course Name**	**Category**	**L-T-P**	**Credits**
1	CS20APC501	Computer Networks	PC	3-0-0	3
2	CS20APC502	Formal Languages and Compiler Design	PC	3-0-0	3
3	CS20APC504	Operating Systems	PC	3-0-0	3
4	CE20AOE501 EC20AOE501 EE20AOE501 ME20AOE502	**Open Elective-I** Basics of civil engineering Basic VLSI Design Introduction to control SystemsSolar and wind energy systems	OE	3-0-0	3
5	CS20APE501 CS20APE502 CS20APE503 CS20APE504 CS20APE505	**Professional Elective-I** Advanced Computer Architecture Data Warehousing and Data mining Digital Image Processing Object Oriented Analysis Design& Testing Principles of Programming Languages	PE	3-0-0	3
6	CS20APC503	Computer Networks Lab	PC	0-0-3	1.5
7	CS20APC505	Operating Systems Lab	PC	0-0-3	1.5
8	EG20ASC301	Skill Oriented Course-IIISoft Skills	SC	1-0-2	2
9	BA20AMC502	Mandatory non-credit course-IV Intellectual Property Rights	MC	2-0-0	0
10	CH20AMC301	Mandatory non-credit course-V Biology for Engineers	MC	2-0-0	0
11	CS20AIP501	Evaluation of Summer Internship (4 Weeks)	IP		1.5
12	CS20ATS501	Technical SeminarPresentation-I	TS		0.5
13	IT20AMC501	Problem Solving and Programming **(Lateral Entry Students only)**	MC	2-0-0	0
				Total	**22**
14	Honors/Minor courses (The hours distribution can be 3-0-2 or3-1-0 also)			**4-0-0**	**4**
15	Honors/Minor courses (NPTEL/MOOCS)			**2-0-0**	**2**

COURSE OUTCOMES

Sl.No	Subject with code	Course Outcomes
1	**COMPUTER NETWORKS (CS20APC501)**	Identify the software and hardware components of a Computer network
		Develop new routing, and congestion control algorithms
		Assess critically the existing routing protocols
		Explain the functionality of each layer of a computer network
		Choose the appropriate transport protocol based on the application requirements
2	**FORMAL LANGUAGES AND COMPILER DESIGN (CS20APC502)**	Employ finite state machines to solve problems in computing and classify machines by their power to recognize languages
		Understand the basic concept of compiler design, and its different phases which will be helpful to construct new tools like LEX, YACC, etc
		Ability to implement semantic rules into a parser that performs attribution while parsing and apply error detection and correction methods
		Apply the code optimization techniques to improve the space and time complexity of programs while programming
		Ability to design a compiler for a concise programming language
3	**OPERATING SYSTEMS (CS20APC504)**	Understand the OS design structures, its services and basics of a Process
		Analyze various scheduling algorithms and examine concurrency mechanisms in Operating Systems
		Apply memory management techniques in the design of operating systems
		Compare and contrast various structures and organization of the file system and secondary storage structure
		Apply different concepts of Protection and Security services in OS
4	**Computer Networks Laboratory (CS20APC503)**	Design scripts for Wired network simulation
		Design scripts of static and mobile wireless networks simulation
		Analyze the data traffic using tools
		Design JAVA programs for client-server communication
		Construct a wired and wireless networks using the real hardware
5	**OPERATING SYSTEMS LAB (CS20APC505)**	Trace different CPU Scheduling algorithm
		Implement Bankers Algorithms to Avoid and prevent the Dead Lock
		Evaluate Page replacement algorithms
		Illustrate the file organization techniques
		Illustrate shared memory process
		Design new scheduling algorithms

6	**SOFTSKILLS SOC –I (EG20ASC301)**	Recognize the importance of verbal and non verbal skills
		Develop the interpersonal and intrapersonal skills
		Apply the knowledge in setting the SMART goals and achieve the set goals
		Analyze difficult situations and solve the problems in stress-free environment
		Create trust among people and develop employability skills
7	**BIOLOGY FOR ENGINEERS (CH20AMC301)**	Explain about cells and their structure and function. Different types of cells and basics for classification of living Organisms
		Explain about biomolecules, their structure and function and their role in the living organisms. How bio molecules are useful in Industry
		Briefly about human physiology
		Explain about genetic material, DNA, genes and RNA how they replicate, pass and preserve vital information in living Organisms
		Know about application of biological Principles in different technologies for the production of medicines and Pharmaceutical molecules through transgenic microbes, plants and animals
8	**PROBLEM SOLVING AND PROGRAMMING FOR LE (IT20AMC501)**	Solve computational problems
		Select the features of C language appropriate for solving a problem
		Design computer programs for real world problems
		Organize the data which is more appropriated for solving a problem

SRI VENKATESWARA COLLEGE OF ENGINEERING (AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

III B.Tech – II Sem

III B.Tech-II Semester(Theory-5,lab–3,SOC-1MC-2)					
S. No	**Course No**	**Course Name**	**Category**	**L-T-P**	**Credits**
1	CS20APC601	Cryptography and Network Security	PC	3-0-0	3
2	CS20APC603	Machine Learning	PC	3-0-0	3
3	CS20APC605	Web and Internet Technologies	PC	3-0-0	3
4	CS20APE601 CS20APE602 CS20APE603 CS20APE604 CS20APE605	**Professional Elective-II** Artificial Intelligence Big Data Analytics Computer Vision Internet of Things Software Testing	PE	3-0-0	3
5	ME20AOE501 EE20AOE503 EC20AOE602 CE20AOE603	**Open Elective-II** Introduction to Automation Renewable Energy ResourcesSignal Processing Water Resources Planning & Management	OE	3-0-0	3
6	CS20APC602	Cryptography and Network Security Lab	PC	0-0-3	1.5
7	CS20APC604	Machine Learning Lab	PC	0-0-3	1.5
8	CS20APC606	Web and Internet Technologies Lab	PC	0-0-3	1.5
9	CS20ASC601	**Skill Oriented Course-V** Dev Ops	SC	1-0-2	2
10	BA20AMC501	**Mandatory non-credit course-V** Constitution of India	MC	2-0-0	0
11	CS20ATS601	Technical Seminar Presentation-II	TS		0.5
12	AM20AMC601	AI Tools Techniques & Applications for LE	MC	2-0-0	0
13.	MA20AMC301	Logical Skills for Professionals - II	MC	2-0-0	0

COURSE OUTCOMES

Sl.No	Subject with code	Course Outcomes
1	**Cryptography and Network Security (CS20APC601)**	Identify various type of vulnerabilities of a computer network
		Outline various security algorithms
		Design secure systems
		Investigate the threats and identify the solutions for threats
2	**MACHINE LEARNING (CS20APC603)**	Identify machine learning techniques suitable for a given problem
		Solve the real world problems using various machine learning techniques
		Apply Dimensionality reduction techniques for data pre-processing
		Explain what is learning and why it is essential in the design of intelligent machines
		Implement Advanced learning models for language, vision, speech, decision making etc
3	**WEB AND INTERNET TECHNOLOGIES (CS20APC605)**	Construct a basic website using HTML and Cascading Style Sheets
		Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms
		Develop server side programs using Servlets and JSP
		Construct simple web pages in PHP and represent data in XML format
		Utilize AJAX and web services to develop interactive web applications
4	**Cryptography and Network Security Lab (CS20APC602)**	Design scripts for Wired network simulation
		Design scripts of static and mobile wireless networks simulation
		Analyze the data traffic using tools
		Design JAVA programs for client-server communication
		Construct a wired and wireless networks using the real hardware
5	**Machine Learning lab (CS20APC604)**	understand complexity of Machine Learning algorithms and their limitations
		understand modern notions in data analysis-oriented computing
		be capable of confidently applying common Machine Learning algorithms in practice and implementing their own
		Be capable of performing experiments in Machine Learning using real-world data
6	**WEB AND INTERNET TECHNOLOGIES LABORATORY (CS20APC606)**	Ability to create dynamic and interactive web sites
		Gain knowledge of client side scripting using java sript and DHTML
		Demonstrate understanding of what is XML and how to parse and use XML data
		Able to do server side programming with Java Servelets, JSP and PHP

7	**(CS20ASC601) Dev Ops**	Explain how DevOps will balance the needs throughout the SDLC
		Demonstrate how DevOps improves the collaboration and productivity by automation
		Adapt DevOps in real time projects
		Illustrate the continuous integration tools and monitoring tools
8	**MANDATORYCOURSE: CONSTITUTION OF INDIA (BA20AMC501)**	Understand historical background of the constitution making and its importance for Building a democratic India
		Understand the functioning of three wings of the government ie., executive, legislative and judiciary
		Understand the value of the fundamental rights and duties for becoming good citizen of India
		Analyze the decentralization of power between central, state and local self- government
		Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy
9	**ARTIFICIAL INTELLIGENCE TOOLS TECHNIQUES & APPLICATIONS (AM20AMC601)**	Demonstrate various AI applications, languages and Intelligent Agents
		Solve problems using search strategies and understand the basic process of Machine Learning
		Apply classification and regression algorithms on real world data
		Develop an expert system
		Comprehend the structure of an artificial neural network and identify the building blocks of a convolutional neural network
10	**Logical Skills for Professionals-II (MA20AMC301)**	Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of HCF, LCM Factors and Simplification
		Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Pipes, Alligation or Mixture
		Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Table, Bar Graphs and Pie Chart
		Analyze the techniques in Syllogism
		Analyze the techniques in Calendar, Clocks and Number Series Analogy concepts

SRI VENKATESWARA COLLEGE OF ENGINEERING
(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

IV B.Tech – I Sem

IV B.Tech-I Semester(Theory-6,lab–0,SOC-1)					
S. No	**Course No**	**Course Name**	**Category**	**L-T-P**	**Credits**
1	CS20APE701 CS20APE702 CS20APE703 CS20APE704 CS20APE705	**Professional Elective-III** Block Chain Technologies Data Science Data Visualization TechniquesDistributed Computing Service oriented Architecture	PE	3-0-0	3
2	CS20APE706 CS20APE707 CS20APE708 CS20APE709 CS20APE710	**Professional Elective-IV** Advanced Language Processors Cyber Security Deep Learning Full Stack Development Software Project Management	PE	3-0-0	3
3	CS20APE711 CS20APE712 CS20APE713 CS20APE714 CS20APE715	**Professional Elective-V** Agile Methodologies Cloud Computing Malware Analysis Natural language processing Reinforcement Learning	PE	3-0-0	3
4	CE20AOE701 EE20AOE603 ME20AOE602 EC20AOE702	**Open Elective-III** Air Pollution and Quality Control Optimization Techniques Through MATLABPower Generation Techniques Principles of Communication Engineering	OE	3-0-0	3
5	EE20AOE701 EC20AOE705 CE20AOE705 ME20AOE702	**Open Elective-IV** Embedded Systems Introduction to Image Processing Low Cost Housing Techniques Robotics in Industrial Engineering	OE	3-0-0	3
6	BA20AHS701 BA20AHS705 BA20AHS706	**Humanities Elective-II** Business Ethics and Corporate Governance Management Science Strategic Management	HS	3-0-0	3
7	CS20ASC701	**Skill Oriented Course-V** MOOC-2 (NPTEL)/Digital Marketing	SC	1-0-2	2
8	CS20AIP701	**Industrial/Research Internship 1 Month Evaluation Mini Project**	IP	0-0-0	3
9	CS20APW701	**Project Work Stage-I**	PW		2
10	CS20ATS701	**Technical SeminarPresentation- III**	TS		0.5
				Total	**25.5**
11	Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0also)			**4-0-0**	**4**

SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

IV B.Tech – I Sem

S. No	Course No	Course Name	Category	L-T-P	Credits
1	CS20APW801	Project Work Stage – II / Full Internship in Industry	PW	0-0-0	8.5
				Total	**8.5**

1-1-1 – CSA

SRI VENKATESWARA COLLEGE OF ENGINEERING

Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507.

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 analyze 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
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
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
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.

HEAD OF THE DEPARTMENT
COMPUTER SCIENCE & ENGINEERING
S.V. COLLEGE OF ENGINEERING
KARAKAMBADI ROAD, TIRUPATI-517 507.

SRI VENKATESWARA COLLEGE OF ENGINEERING

Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507.

Department of Computer Science and Engineering (AI & ML, CYBER SECURITY & DATA SCIECE)

S.NO	COURSE CODE/SUBJECT CODE	COURSE NAME	YEAR/SEMESTER	COURSE OUTCOMES
1	C111.1	Linear Algebra & Calculus	I-I	Develop the use of matrix algebra techniques that is needed by engineers for practical applications
	C111.2			Utilize mean value theorems to real life problems
	C111.3			Familiarize with functions of several variables which are useful in optimization
	C111.4			Apply multiple integrals to find the area and volumes for different functions
	C111.5			Analyze the concepts of Beta and Gamma special function for different functions
	C111.6			
2	C112.1	Chemistry		Estimate the amount of hardness and DO present in water
	C112.2			Compare the materials of construction for battery and electrochemical sensors
	C112.3			Explain the preparation, properties, and applications of thermoplastics &thermosetting, elastomers & conducting polymers
	C112.4			Explain the principles of spectrometry
	C112.5			Apply the principle of Band diagrams in application of conductors and semiconductors
3	C113.1	Problem Solving Using C		Solve computational problems
	C113.2			Select the features of C language appropriate for solving a problem
	C113.3			Design computer programs for real world problems
	C113.4			Organize the data which is more appropriated for solving a problem
4	C114.1	Basic Electrical & Electronics Engineering		Explain the theory, construction, and operation of electronic devices.
	C114.2			Apply the concept of science and mathematics to explain the working of diodes and its applications, working of transistor and to solve the simple problems based on the applications
	C114.3			Analyze small signal amplifier circuits to find the amplifier parameters
	C114.4			Design small signal amplifiers using proper biasing circuits to fix up proper Q point
	C114.5			Distinguish features of different active devices including Microprocessors
5	C115.1	Engineering Workshop		Identify tools, work material, measuring instruments useful for domestic applications
	C115.2			Apply wood working skills in real world applications
	C115.3			Build different parts with metal sheets in real world applications
	C115.4			Apply fitting operations in various applications for good strength
	C115.5			Analyze different types of basic electric circuit connections
	C115.6			Demonstrate soldering and brazing in joining circuits
	C115.7			Make moulds for sand casting using standard equipment
	C115.8			Develop different weld joints for various metals
	C115.9			Inspect various parts of machine components
	C115.10			Make plastic components using proper raw material

6	C116.1	IT Workshop		Identify the Internal parts of computers and Generation of Computers
	C116.2			Assemble and disassemble a computer from its parts and prepare the computer ready to use
	C116.3			Installation process of different types Operating system for a computer by their own
	C116.4			Interconnect two or more computers for information sharing
	C116.5			Access the Internet and browse it for required information
	C116.6			Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX
	C116.7			Prepare slide presentation using the presentation tool
7	C117.1	Chemistry Lab		Determine the cell constant and conductance of solutions
	C117.2			Prepare advanced polymer- Bakelite
	C117.3			Measure the strength of an acid present in secondary batteries
	C117.4			Analyse the IR of some organic compounds
	C117.5			Estimate the amount of dissolved oxygen in water
8	C118.1	Problem Solving Using C Lab		Build algorithm and flowchart for simple problems
	C118.2			Use suitable control structures to solve problems
	C118.3			Use suitable iterative statements, arrays and modular programming to solve the problems
	C118.4			Implement Programs using pointers and String handling Functions
	C118.5			Develop code for complex applications using structures, unions and file handling features
9	C119.1	Basic Electrical & Electronics Engineering Lab		Verify Kirchoff's Laws & Superposition theorem
	C119.2			Perform testing on AC and DC Machines
	C119.3			Study I – V Characteristics of PV Cell.
	C119.4			Learn the characteristics of basic electronic devices like PN junction diode, Zener diode & BJT
	C119.5			Construct the given circuit in the lab
	C119.6			Analyze the application of diode as rectifiers, clippers and clampers and other circuits
	C119.7			Design simple electronic circuits and verify its functioning
10	C1110.1	Speech and Oral Communication		Improve the neutral accent and be free from mother tongue influence.
	C1110.2			Hypothesizing small talks on general topics and learn critiquing skills by participating in Conversations
	C1110.3			Applying Vocabulary and using it in their day-to-day life.
	C1110.4			Understanding and mastering in verbal and non-verbal communication
11	C121.1	Differential Equations & Vector Calculus	I-II	Solve the differential equations related to various engineering fields.
	C121.2			Solve the linear differential equations of higher order related to various engineering fields
	C121.3			Identify solution methods for partial differential equations that model physical processes
	C121.4			Interpret the physical meaning of different operators such as gradient, curl and divergence.
				Estimate the work done against a field, circulation and flux using vector calculus

12	C122.1	Applied Physics		Apply the different realms of physics and their applications in both scientific and technological systems through physical optics
	C122.2			Understand the mechanisms of emission of light, the use of lasers as light sources for low and high energy applications
	C122.3			Understands the response of dielectric and magnetic materials to the applied electric and magnetic fields
	C122.4			Apply the quantum mechanical picture of subatomic world along with the discrepancies between the classical estimates and laboratory observations of electron transportation phenomena by free electron theory and band theory
	C122.5			Elaborate the physical properties exhibited by materials through the understanding of properties of semiconductors and superconductors
13	C123.1	Communicative English		Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English
	C123.2			Apply grammatical structures to formulate sentences and correct word forms
	C123.3			Analyze discourse markers to speak clearly on a specific topic in informal discussions
	C123.4			Evaluate reading/listening texts and to write summaries based on global comprehension of these texts
	C123.5			Create a coherent paragraph interpreting a figure/graph/chart/table.
14	C124.1	Data Structures		Analyze the problems using asymptotic notations
	C124.2			Apply Stack, Queues and linked list to solve different applications
	C124.3			Demonstrate suitable sorting techniques for the real world problem.
	C124.4			Implement tree structures in different patterns of representation of data.(
				Analyze the given problem using graph traversal techniques
15	C125.1	Engineering Drawing		Draw basic geometrical constructions, curves used in engineering practices
	C125.2			Understand the concept of projection and acquire visualization skills, projection of points, Lines and Planes
	C125.3			Illustrate the projections of solids graphically
	C125.4			Draw and explore the sectional views of right regular solids
				Draw the development of surfaces of solids.
16	C126.1	Engineering Graphics Lab		Draw the basic views related to projections of Lines, Planes
	C126.2			Draw the basic views related to projections of Planes
	C126.3			Illustrate orthographic views of simple objects
	C126.4			Illustrate isometric projections of simple solids
				Interpret and comprehend with drafting packages for engineering practice
17	C127.1	Communicative English Lab		Develop to handle and excel in a variety of self-instructional, learner-friendly modes of language learning
	C127.2			Develop to employ better stress and intonation patterns and utter English sounds correctly
	C127.3			Develop to avoid the impact of mother tongue in English and neutralize their accent
	C127.4			Develop to participate with skill and confidence in Group Discussions, Interviews and Public Speaking
	C127.5			Utilize the technical skills to prepare resume, report-writing, and format-making etc.

18	C128.1	Applied Physics Lab		Utilize optical instruments like microscope and spectrometer.
	C128.2			Determine thickness of a hair/paper with the concept of interference
	C128.3			Estimate the wavelength of different colors using diffraction grating and resolving power
	C128.4			Organize the intensity of the magnetic field of circular coil carrying current with distance
	C128.5			Evaluate the acceptance angle of an optical fiber and numerical aperture
				Determine the resistivity of the given semiconductor using four probe method
				Identify the type of semiconductor i.e., n-type or p-type using hall effect
				Determine the band gap of a given semiconductor.
19	C129.1	Data Structures Lab		Demonstrate the concept of Recursion for solving a problem
	C129.2			Choose and implement linear data structure to solve problems
	C129.3			Develop programs for searching and sorting algorithms
	C129.4			Select and implement suitable nonlinear data structure for solving a problem.
20	C1210.1	Universal Human Values		Understanding the value of education to become more aware of themselves, and their surroundings (family, society, nature).
	C1210.2			Utilize the concepts of human being-harmony in myself become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind
	C1210.3			Understanding the concepts of society-harmony in human for better critical ability
				Understanding the human values, human relationship and human society to become sensitive to their commitment
				Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction
21	C1211.1	Logical Skills for Professionals-I		Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Averages - Percentages - Ratio
	C1211.2			Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Partnership - Simple Interest and Compound Interest and time and distance
	C1211.3			Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of time ad work, problems on trains and Boats and streams.
	C1211.4			Analyze the techniques in series, coding and decoding and blood relations
	C1211.5			Analyze the techniques in directions, problems on ages and analogy.
22	C211.1	Discrete Mathematics & Graph Theory	II-I	Apply mathematical concepts and logical reasoning to solve problems in different fields of Computer science and information technology
	C211.2			Apply the properties of Set theory to find Equivalence and Partial Ordering relations and Hasse Diagrams for different functions
	C211.3			Analyse the properties of Algebraic Structures to find the given sets are Semi group, Monoids and Groups
	C211.4			Analyse the concepts of Generating and Recurrence relations for solving Homogeneous and In-Homogeneous equations
	C211.5			Investigate the graphs are Isomorphic Graphs, Euler and Hamilton Graphs

23	C212.1	Design & Analysis of Algorithms		Analyze the complexity of the algorithms.
	C212.2			Make use of various design techniques like divide and conquer, greedy, dynamic programming, backtracking, branch and bound to solve the problems
	C212.3			Identify and analyze criteria and specifications appropriate to new problems, and choose the appropriate algorithmic design technique for their solution
	C212.4			Able to prove that a certain problem is NP-Complete
24	C213.1	Computer Organization & Architecture		Understand the computer organization concepts related to design of modern processors, memories and I/Os
	C213.2			Identify the hardware requirements for cache memory and virtual memory
	C213.3			Understand the importance and tradeoffs of different types of memories
	C213.4			Design algorithms to exploit pipelining and multiprocessors
				Identify pipeline hazards and possible solutions to those hazards
25	C214.1	Database Management Systems		Design a database for a real world informationsystem
	C214.2			Define transactions which preserve the integrity of thedatabase
	C214.3			Generate tables for a database
	C214.4			Organize the data to preventredundancy
	C214.5			Pose queries to retrieve the information fromdatabase

26	C215.1	Python Programming		Apply the features of Python language in various real applications
	C215.2			Select appropriate core data structure of Python for solving a problem
	C215.3			Design object-oriented programs using Python for solving real-world problems
	C215.4			Apply modularity to programs
				Design graphics using turtle module
27	C216.1	Algorithms Lab		Apply the Divide andConquer strategy to solve searching, sorting problems
	C216.2			Analyze the efficiency of Greedy and Dynamic Programming design techniques to solve the optimizationproblems
	C216.3			Relate Backtracking technique for solving constraint satisfaction problems
28	C217.1	Database Management Systems Lab		Work with the concepts of DDL, DML, DCL Commands
	C217.2			Design of databases for real life systems using Oracle
	C217.3			Learning of SQL queries on the real-life systems
	C217.4			Execution of PL/SQL programs for different problems
29	C218.1	Python Programming Lab		Design solutions to mathematical problems
	C219.2			Organize the data for solving the problem
	C218.2			Develop Python programs for numerical and text-based problems
	C219.3			Select appropriate programming construct for solving the problem
				Illustrate object-oriented concepts
30	C219.1	Linux Administration(Skill Oriented Course		Understand shell script to create files and handle text documents
	C219.2			Analyze various methodologies in Linux administration.
	C219.3			Implementation of IPC through shell programming in the Linux environment.
	C219.4			Create child processes and background processes
31	C2110.1	Environmental Science		Understanding multidisciplinary nature of environmental studies and various renewable and nonrenewable resources
	C2110.2			Understand flow and bio-geo- chemical cycles and ecological pyramids.
	C2110.3			Understand various causes of pollution and solid waste management and related preventive measures.
	C2110.4			Apply the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation
	C2110.5			Apply the concepts of population explosion, value education and welfare programmes in society
32	C2111.1	Enhancing English Language Skills		Use English language, both written and spoken, competently and correctly
	C2111.2			Improve comprehension and fluency of speech.
	C2111.3			Hone the communication skills to meet the challenges of their careers successfully
				Gain confidence in using English in verbal situations
				Strengthen communication skills in different contexts like formal and informal

33	C221.1	Numerical Methods, Probability & Statistics	II-II	Apply different methods to find roots of algebraic and transcendental equations.
	C221.2			Apply different methods to find approximate solution of ordinary differential equations and Numerical Integration
	C221.3			Analyse the concepts of probability and their applications.
	C221.4			Apply discrete and continuous probability distributions in practical problems
	C221.5			Analyse the statistical inferential methods based on small and large sampling tests.
34	C222.1	Object Oriented Programming Through Java		To solve real world problems using OOP techniques
	C222.2			To apply code reusability through inheritance, packages and interfaces
	C222.3			To solve problems using java collection framework and I/O classes
	C222.4			To develop applications by using parallel streams for better performance
	C222.5			To build GUIs and handle events generated by user interactions
35	C223.1	Operating Systems		Understand theOS design structures, its services and basics of a Process
	C223.2			Analyze various scheduling algorithms and examine concurrency mechanisms in Operating Systems.
	C223.3			Apply memory management techniques in the design of operating systems
	C223.4			Compare and contrast various structures and organization of the file system and secondary storage structure
				Apply different concepts of Protection and Security services in OS
36	C224.1	Digital Electronics & Microprocessors		To understand the concept of Logic circuits and analyze various Boolean algebra functions
	C224.2			To understand the concept of CombinationalLogicand SequentialLogic Circuits
	C224.3			To create combinational circuits using PLD's
	C224.4			To understand the concepts of 8085, 8086 Microprocessor and 8051 Microcontroller
				Apply knowledge and demonstrate programming proficiency using various addressing modes and instruction sets of 8086 & 8051
37	C225.1	Object Oriented Programming Through Java Lab		Recognize the Java programming environment
	C225.2			Select appropriate programming construct to solve a problem
	C225.3			Develop efficient programs using multithreading
	C225.4			Design reliable programs using Java exception handling features
				Extend the programming functionality supported by Java
38	C226.1	Operating Systems Lab		Trace different CPU Scheduling algorithm
	C226.2			Implement Bankers Algorithms to Avoid and prevent the Dead Lock.
	C226.3			Evaluate Page replacement algorithms.
	C226.4			Illustrate the file organization techniques
				Illustrate shared memory process.
				Design new scheduling algorithms
39	C227.1	Digital Electronics & Microprocessors Lab		Analyze the concepts ofLogic Gatesand Boolean functions
	C227.2			Analyze CombinationalLogicand SequentialLogic Circuits
	C227.3			Analyze the logic circuits using Programmable Logic Devices
	C227.4			Apply knowledge and demonstrate programming proficiency using various addressing modes and instruction sets of 8086 & 8051

40	C228.1	Operating Systems Laboratory		Analize differnt types of CPU scheduling algorithms which makes always CPU busy.
	C228.2			Analyze and apply different types of file system management.
	C228.3			Implement various process synchronization techniques for operating system.
41	C229.1	Exploratory Data Analysis with R		Install and use R for simple programming tasks
	C229.2			Extract data from files and other sources and perform various data manipulation tasks on them
	C229.3			Explore statistical functions in R
	C229.4			Use R Graphics and Tables to visualize results of various statistical operations on data
	C229.5			Apply the knowledge of R gained to data Analytics for real-life applications
42	C2210.1	Design Thinking for Innovation		Generate and develop different design ideas
	C2210.2			Appreciate the innovation and benefits of design thinking
	C2210.3			Experience the design thinking process in IT and agile software development
	C2210.4			Understand design techniques related to variety of software services.
43	C2211.1	Engineering Mathematics		Develop the use of matrix algebra techniques that is needed by engineers for practical applications
	C2211.2			Utilize mean value theorems to real life problems
	C2211.3			Solve the differential equations related to various engineering fields
	C2211.4			Apply multiple integrals to find the area and volumes for different functions
	C2211.5			Estimate the work done against a field, circulation and flux using vector calculus.

HEAD OF THE DEPARTMENT
COMPUTER SCIENCE & ENGINEERING
S.V. COLLEGE OF ENGINEERING
KARAKAMBADI ROAD, TIRUPATI-517 507.

SRI VENKATESWARA COLLEGE OF ENGINEERING

(Autonomous)

Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507.

Accredited by NBA (B.Tech – CSE, ECE,EEE,Mech.,Civil and IT) & NAAC with 'A' Grade

Approved by AICTE, New Delhi permanently affiliated to JNTUA, Ananthapuram.

DEPARTMENT OF MCA

PROGRAMME OUTCOMES

PO1: An ability to apply knowledge of mathematics, computer science and management in practice

PO2: An ability to identify, critically analyze, formulate and develop computer applications

PO3: An ability to select modern computing tools and techniques and use them with dexterity

PO4: An ability to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability

PO5: An ability to devise and conduct experiments, interpret data and provide well informed conclusions

PO6: An ability to understand the impact of system solutions in a contemporary, global, economical, environmental, and societal context for sustainable development.

PROGRAMME SPECIFIC OUTCOMES

PSO1: Understand, analyze and develop computer programs in the areas related to algorithms, Process and solutions for specific application Development using appropriate data modeling concepts.

PSO2: Apply standard Software Engineering practices and strategies in software project development using open-source programming environment To deliver quality product for business success.

PSO3: Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions To existing problems.

H.O.D. M.C.A.
S.V. COLLEGE OF ENGINEERING
KARAKAMBADI ROAD, TIRUPATI - 517 507

SRI VENKATESWARA COLLEGE OF ENGINEERING
(Autonomous)
Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507.
Accredited by NBA (B.Tech – CSE, ECE,EEE,Mech.,Civil and IT) & NAAC with 'A' Grade
Approved by AICTE, New Delhi permanently affiliated to JNTUA, Ananthapuram.

DEPARTMENT OF MCA

S. No	COURSE NAME	COs	COURSE OUTCOMES
1	Computer Organization (CA20FPC101)	C111.1	Explain the organization of basic computer, its design & the design of control unit and trade-offs between hardware and software.
		C111.2	Students will formulate and solve problems, understand the performance requirement of the systems and the operations & languages of the register transfer, micro operations and input-output organization.
		C111.3	Students can understand how computer stores positive and negative numbers
		C111.4	Understand the organization of memory and memory management hardware.
		C111.5	Elaborate advanced concepts of computer architecture, Parallel Processing, inter- processor communication and synchronization.
2	Data Structures Using C (CA20FPC102)	C112.1	Analyze the basic concepts of C Programming language.
		C112.2	Design applications in C, using functions, arrays, pointers and structures.
		C112.3	Apply various operations of Stacks and Queues in solving the problems.
		C112.4	Explain operations on Linked lists.
		C112.5	Demonstrate various tree traversals and graph traversal techniques.
3	Database Management Systems (CA20FPC103)	C113.1	Design a database for a real-world information system
		C113.2	Define transactions which preserve the integrity of the database
		C113.3	Generate tables for a database

		C113.4	Organize the data to prevent redundancy
		C113.5	Pose queries to retrieve the information from database
4	**Accounting and Financial Management(BA20FHS101)**	**C114.1**	The student will be able to understand the basic accounting principles
		C114.2	Get exposure to the fundamental concepts, techniques and tools of Financial Management,
		C114.3	Enable to prepare and analyze financial statements of business enterprises for taking sound financial decisions.
5	**Mathematical Foundations for Computer Science (CA20FPC104)**	**C115.1**	Able to apply mathematical concepts and logical reasoning to solve problems in different fields of Computer science and information technology.
		C115.2	Able to apply the concepts in courses like Computer Organization, DBMS, Analysis of Algorithms, Theoretical Computer Science, Cryptography, Artificial Intelligence
6	**Computer Networks (CA20FPC105)**	**C116.1**	Ability to choose the transmission media depending on the requirements.
		C116.2	Ability to design new protocols for computer network.
		C116.3	Ability to configure a computer network logically.
7	**Database Management Systems Lab (CA20FPC106)**	**C117.1**	Design database for any real world problem
		C117.2	Implement PL/SQL programs
		C117.3	Define SQL queries
		C117.4	Decide the constraints
		C117.5	Investigate for data inconsistency
8	**Data Structures Using C Lab (CA20FPC107)**	**C118.1**	Demonstrate basic concepts of C programming language.
		C118.2	Develop C programs using functions, arrays, structures and pointers.
		C118.3	Illustrate the concepts Stacks and Queues.
		C118.4	Design operations on Linked lists.

		C118.5	Apply various Binary tree traversal techniques.
			Develop searching and sorting methods
9	**Office Automation & Trouble shooting Lab (CA20FPC108)**	**C119.1**	Preparing a Govt. Order / Official Letter / Business Letter / Circular Letter Covering formatting commands - font size and styles - bold, underline, upper case, lower case, superscript, subscript, indenting paragraphs, spacing between lines and characters, tab settings etc.
		C119.2	Printing envelopes and mail merge. To print envelopes with from addresses and to addresses to use mail merge facility for sending a circular letter to many persons to use mail merge facility for printing mailing labels
		C119.3	Create an advertisement Prepare a resume. Prepare a Corporate Circular letter inviting the shareholders to attend the Annual Meeting
		C119.4	Using formulas and functions: To prepare a Worksheet showing the monthly sales of a company in different branch offices (Showing Total Sales, Average Sales). Prepare a Statement for preparing Result of 10 students in 5 subjects (using formula to get Distinction, I Class, II Class and Fail under Result column against each student
		C119.5	Creating a Chart: To create a chart for comparing the monthly sales of a company in different branch offices.
		C119.6	Troubleshoot the following OS problems Unable to copy and paste Replacing Windows Splash Screens Out of memory error Windows cannot find Program.exe to open ... Windows Installer error
10	**Mandatory Course(Corporate Communication Skills) (CA20FMC101)**	**C11A.1**	Understand verbal and non-verbal features of communication and hold formal / informal conversations
		C11A.2	The significance of paralinguistic features will be understood by the students and they will try to be intelligible.
		C11A.3	Become good at Inter-personal skills

		C124.5	Utilize the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.
15	**Software Engineering (CA20FPC204)**	**C125.1**	Define and develop a software project from requirement gathering to implementation.
		C125.2	Ability to code and test the software
		C125.3	Ability to plan, Estimate and Maintain software systems
16	**Artificial Intelligence (CA20FPC208)**	**C126.1**	Possess the ability to formulate an efficient problem space for a problem expressed in English
		C126.2	Possess the ability to select a search algorithm for a problem and characterize its time and space complexities.
		C126.3	Possess the skill for representing knowledge using the appropriate technique
		C126.4	Possess the ability to apply AI techniques to solve problems of Game Playing, Expert Systems and Machine Learning.
17	**Operating Systems Lab (CA20FPC210)**	**C127.1**	Ensure the development of applied skills in operating systems related areas.
		C127.2	Able to write software routines modules or implementing various concepts of operating system.
18	**Python Programming Lab (CA20FPC211)**	**C128.1**	Use python basic concepts to develop problems to solve computational problems.
		C128.2	Apply lists, dictionaries, sets and functions in python programming
		C128.4	Experiment module design and text files in python programming
19	**Java Programming Lab (CA20FPC212)**	**C129.2**	Solve simple problems using the fundamental syntax and semantics of Java
		C129.3	Analyze and design Java programs using object-oriented principles
		C129.4	Develop simple GUI interfaces with event handling capabilities
		C129.5	Develop and debug java programs using an IDE

		C11A.4	Achieve neutral accent and be free from mother tongue influence
		C11A.5	Being an active participant in debates and group discussion, showing ability to express agreement, argument to summarize ideas to elicit the views of others and present own ideas.
11	**Operating Systems (CA20FPC201)**	**C121.1**	Able to use operating systems effectively.
		C121.2	Write System and application programs to exploit operating system functionality.
		C121.3	Add functionality to the exiting operating systems
		C121.4	Design new operating systems
12	**Python Programming (CA20FPC202)**	**C122.1**	Apply the features of Python language in various real applications.
		C122.2	Select appropriate data structure of Python for solving a problem.
		C122.3	Design object-oriented programs using Python for solving real-world problems.
		C122.4	Apply modularity to programs.
13	**OOPS through JAVA (CA20FPC203)**	**C123.1**	Use object-oriented approach for solving problems and implementing them
		C123.2	Ability to write Efficient programs that handle exceptions
		C123.3	Create user friendly interface
14	**Probability and Statistics (MA20FBS201)**	**C124.1**	Make use of the concepts of probability and their applications
		C124.2	Apply discrete and continuous probability distributions to analyze statistical data.
		C124.3	Design the components of a classical hypothesis test for large samples.
		C124.4	Infer the statistical inferential methods based on small sampling tests.

20	Design and Analysis of Algorithms (CA20FPC301)	C12A.1	Ability to analyse the performance of algorithms.
		C12A.2	Ability to choose appropriate algorithm design techniques for solving problems.
		C12A.3	Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.
21	Data Science & Analytics (CA20FPC302)	C12B.1	Understand business intelligence and business and data analytics.
		C12B.2	To understand the business data analysis through the powerful tools of data application.
		C12B.3	Understand the methods of data mining.
		C12B.4	Apply basic tools (plots, graphs, summary statistics) to carry out EDA.
		C12B.5	Understand the key elements of a data science project
		C12B.6	Identify the appropriate data science technique and/or algorithm to use for the major data science tasks
22	Web Technologies (CA20FPC303)	C211.1	Ability to design websites and do client side validations
		C211.2	Share information over a network
		C211.3	Ability to write server side programs
23	Cloud Computing (CA20FPC304)	C212.1	Understand the concepts of cloud computing and its related techniques.
		C212.2	Provide a pleasant and effective user interface
24	Software Testing (CA20FPC305)	C213.1	Understand the basic testing procedures.
		C213.2	Able to support in generating test cases and test suites.
		C213.3	Able to test the applications manually by applying different testing methods and automation tools.
		C213.4	Apply tools to resolve the problems in Real time environment.
25	Big data Analytics	C214.1	Analyse the big data analytics techniques for useful business application.

	(CA20FPC312)	C214.2	Design efficient algorithms for mining the data from large volumes.
		C214.3	Analyse the HADOOP and Map Reduce technologies associated with big data analytics.
		C214.4	Explore on big data applications using Pig and Hive.
26	Design and Analysis of Algorithms Lab(CA20FPC315)	C215.1	Ability to analyse the performance of algorithms.
		C215.2	Ability to choose appropriate algorithm design techniques for solving problems.
		C215.3	Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.
27	Data Science and Analytics Lab (CA20FPC316)	C216.1	Understand and use appropriate and relevant, fundamental and applied mathematical and statistical knowledge, methodologies and modern computational tools;
		C216.2	Recognise and use research principles and methods applicable to data science.
		C216.3	Extract an interpretation of data using exploratory data analysis
		C216.4	Visualise and plot graphical representations of data.
28	Web Technologies Lab (CA20FPC317)	C217.1	Ability to apply object oriented concepts for programming and its use.
		C217.2	Practical WEB Development using java by using JDBC and ODBC connectivity.
		C217.3	Implementation of servlets and PHP connectivity by using MYSQL applications.
		C217.4	Learning how to use PHP in different operating systems with different editors like eclipse and net beans.
		C217.5	Acquire skills to develop final project by acquired knowledge during curriculum.
29	Mandatory	C218.1	Students are expected to become more aware of themselves, and their surroundings (family, society, nature)

	Course(Universal Human Values) (CA20FMC318)	**C218.2**	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
		C218.3	They would have better critical ability.
		C218.4	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
		C218.5	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

H.O.D. M.C.A.
S.V. COLLEGE OF ENGINEERING
KARAKAMBADI ROAD,TIRUPATI - 517 507