



# **SRI VASAVI ENGINEERING COLLEGE**

## **(AUTONOMOUS)**

(Sponsored by Sri Vasavi Educational Society)

(Approved by AICTE, New Delhi & Recognized by UGC under section 2(f) & 12(B))

(Permanently affiliated to JNTUK, Kakinada, Accredited by NBA and NAAC with 'A' Grade)  
Pedatadepalli, **TADEPALLIGUDEM-534 101.W.G.Dist. (A.P)**

## **V18 REGULATION COURSE OUTCOMES**

### **DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

## I-SEMESTER

**NAME OF THE COURSE: ENGLISH-I**

**COURSE CODE : V18ENT01**

**Course Outcomes:**

- **CO-1:** Understand human resources and their contribution to the society, listen to and read a text to comprehend, interpret and answer questions, and use prepositions and tenses appropriately.
- **CO-2:** Appraise the problems of transport and the solutions, write the gist of a short-story, know the etymological roots of words, use prefixes and exhibit basic skills in writing.
- **CO-3:** View Solar Energy as a viable alternative source, and read for comprehension, analysis and interpretation and present narratives in writing.
- **CO-4 :** Evaluate various alternative sources of energy, spell words appropriately, pronounce them with proper stress, punctuate sentences correctly and narrate instances and stories.
- **CO-5:** Realize the value of our living environment, describe animals, birds, objects, events, processes, etc., write paragraphs coherently and use connectors effectively.
- **CO-6:** Grasp the vital role of training in industrial organizations, use prepositions, take notes, follow the of ice etiquette and write impressive narrations.

**NAME OF THE COURSE: MATHEMATICS-I**

**COURSE CODE : V18MAT01**

**Course Outcomes:**

**At the end of the course student will be able to:**

**C01:** Apply matrix technique to solve system of linear equation.

**C02:** Find Eigenvalues and Eigen vectors

**C03:** Solve the ordinary differential equations of first order & first degree

**C04:** Solve the linear differential equations of higher order

**C05:** Calculate maxima and minima of functions of two variables

**C06:** Solve first order partial differential equations.

## NAME OF THE COURSE: ENGINEERING CHEMISTRY

**COURSE CODE : V18CHT01**

### Course Outcomes:

At the end of the course, the student should be able to:

**C01:** Apply different plastics and rubbers for various engineering applications.

**C02:** Assess the quality of fuels and apply the knowledge of fuels for the preservation of natural fuels.

**C03:** Understand relevant concepts of Electro Chemistry to apply them in designing electrochemical energy systems.

**C04:** Analyze boiler troubles arising due to poor water quality and suggest suitable water treatment methods for different industrial applications.

**C05:** Analyze the causes for practical corrosion problems and apply corrosion principles for protection of metallic structures from corrosion.

**C06:** Identify the important applications of advanced engineering materials.

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## NAME OF THE COURSE: PROGRAMMING IN C FOR PROBLEM SOLVING

**COURSE CODE : V18CST01**

### Course Outcomes:

**C01:** Describe various problem solving strategies such as Algorithms and Flowcharts (K2)

**C02:** Develop various programming constructs using Control Structures. (K3)

**C03:** Summarize the process of modular programming approach (K5)

**C04:** Illustrate the usage of String handling functions and pointers (K3)

**C05:** Construct Programs using Structures and Unions. (K3)

**C06:** Distinguish between Sequential files and Random access files. (K4)

## NAME OF THE COURSE: ENGINEERING GRAPHICS

**COURSE CODE : V18MET01**

### Course Outcomes:

After successful completion of the course, the student will be able to

**C01:** Demonstrate the usage of drawing instruments and sketch conic sections (K3)

**C02:** Construct different types of scales and special curves (K5)

**C03:** Draw the projections of the points, lines and planes with reference to the principal planes. (K2)

**C04:** Develop the projections of solids and its surfaces. (K3)

**C05:** Draw the Isometric projections of solids. (K2)

**C06:** Convert the isometric view to orthographic view and vice versa. (K2)

## **NAME OF THE COURSE: ENGLISH COMMUNICATION SKILLS LAB-I**

**COURSE CODE : V18ENL01**

### **Course Outcomes**

**CO-1:** Listen to and make inquiries on phone, thank and respond to thanks in appropriate spoken idiom.

**CO-2:** Make requests, give permissions and directions in fluent English

**CO-3:** Articulate well in the contexts of clarifying, inviting, complaining, congratulating, apologizing, advising, agreeing and disagreeing in conversational mode

**CO-4:** Distinguish and pronounce letters and sounds of English phonetically

**CO-5:** Practice and pronounce consonants, vowels and diphthongs and consonant clusters

**CO-6:** Listen to and understand different accents in English, and pronounce English words and speak sentences with right stress and intonation.

## **NAME OF THE COURSE: PROGRAMMING LAB IN 'C' FOR PROBLEM SOLVING**

**COURSE CODE : V18CSL01**

### **Course Outcomes:**

**CO 1:** Demonstrate problem solving techniques using Control Structures. **(K3)**

**CO 2:** Construct Programmes using the concepts of Arrays, Strings and Pointers. **(K3)**

**CO3:** Apply the concepts of Functions, Structures and Unions. **(K3)**

**CO4:** Use various file processing operations to develop real time applications. **(K4)**

## **NAME OF THE COURSE: ENGINEERING CHEMISTRY LABORATORY**

**COURSE CODE : V18CHL01**

### **Course Outcomes:**

At the end of the course, the student will be able to:

**CO1:** Analyse quantitatively a variety of samples using volumetric methods and instrumental methods.

**CO2:** Applying volumetric and instrumental methods for the determination of water quality parameters namely Alkalinity, Hardness and pH.

**CO3:** Prepare polymeric materials and analyse the given coal samples.



## II SEMESTER

**NAME OF THE COURSE: ENGLISH-II**

**COURSE CODE : V18ENT02**

### **Course Outcomes**

**CO-1:** Understand the real import of education and work of noble men, use nouns, verbs and adjectives appropriately, identify and correct common errors in usage and write of icial letters.

**CO-2:** Derive inspiration from real life samples, interpret and speak on them, use synonyms and antonyms of words properly and do E-correspondence with required netiquette.

**CO-3:** Assimilate and adjust to new cultural environments, write on life-sketches, make the right use of tense and aspect and concord in sentences and plan and develop speech-writing.

**CO-4:** Imbibe ideas from the lives and works of successful men, use adverbs, develop view-points and topics and write different types of essays.

**CO-5:** Emulate personality-development inputs, elaborate on inspiring scientists use one-word substitutes, develop précis writing and write for the media.

**CO-6:** Learn from the paradigm of great contributors, use collocations and write professional and technical reports in standard formats.

**NAME OF THE COURSE: MATHEMATICS -II**

**COURSE CODE : V18MAT02**

**Course Outcomes:** At the end of the Course student will be able to:

**CO1:** Estimate approximate root of algebraic and transcendental equations

**CO2:** Compute interpolating polynomial for the given data

**CO3:** Solve ordinary differential equations using numerical methods

**CO4:** Evaluate multiple integrals and improper integrals

**CO5:** Calculate gradient of a scalar function, divergence and curl of a vector function.

**CO6:** Apply the knowledge of vector integral concepts to ind characteristics of vector ields

**NAME OF THE COURSE: OPTO-ELECTRONICS & SEMICONDUCTORS**

**COURSE CODE : V18PHT02**

**A student who successfully ful ills the course requirements will be able to**

1. Expose the students to the basic concepts of Lasers, optical ibers and their properties.
2. Interpret wavelike behavior of matter and how this motivates the need to replace classical mechanics by a wave equation of motion for matter (the Schrödinger equations)
3. Distinguish fundamental physical laws for better understanding of materials and their properties for engineering applications.
4. Apply fundamental principles and processes to operational semiconductor devices and their uses.

## **NAME OF THE COURSE: INTRODUCTION TO ENGINEERING MECHANICS**

**COURSE CODE : V18MET02**

### **Course Outcomes:**

After successful completion of the course, the student will be able to

- C01:** Compute the resultant force of a given system of forces (K3)
- C02:** Calculate Equilibrium of different force systems by using free body diagrams (K3)
- C03:** Solve the 2D equilibrium problems by considering friction (K3)
- C04:** Find the Centroid, Center of Gravity and Moment of Inertia for plane figures and bodies (K3)
- C05:** Illustrate the different types of plane motions of a particle to compute its velocity, acceleration and force. (K3)
- C06:** Illustrate the concept of Work and Energy (K3)

## **NAME OF THE COURSE: ENVIRONMENTAL STUDIES**

**COURSE CODE : V18CHT02**

### **Course Outcomes:**

At the end of the course, the student should be able to:

- CO1: Identify the global environmental challenges and the possible means to combat them.
- CO2: Examine the natural resources, their availability for the sustenance of the life and conservation.
- CO3: Assess the concepts of the ecosystem and the need for protecting various ecosystems.
- CO4: Discuss the biodiversity, threats and conservation practices to protect the biodiversity
- CO5: Explain various attributes of the pollution and waste management practices.
- CO6: Outline the environmental management and environmental legislations in India.

## **NAME OF THE COURSE: ENGLISH COMMUNICATION SKILLS LABORATORY-II**

**COURSE CODE : V18ENL02**

### **Course Outcomes:**

- CO-1:** Listen to people critically and argue rationally to present a view-point confidently in formal debates.
- CO-2:** Exhibit team spirit and communicative skill and participate effectively in group discussions.
- CO-3:** Plan, structure and give presentations in professional manner.
- CO-4:** Face and perform well in interviews with required etiquette.
- CO-5:** Compose E-mails in standard formats to communicate clearly and write different types of CV in vogue that befit today's career needs.
- CO-6:** Make apt use of idiomatic expressions and recognize and correct typical errors that Indian speakers of English make in pronunciation, spelling, vocabulary and grammar.

**NAME OF THE COURSE: ELECTRICAL ENGINEERING WORKSHOP****COURSE CODE : V18EEL03****Course Outcomes:**

After successful completion of this course, the students will be able to

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
C01	Design different wiring circuits	K4
C02	Use electrical parameter measuring instruments	K3
C03	Construct the circuits on PCB board	K4
C04	Test the domestic appliances	K4
C05	Identify the parts of the Machine	K3
C06	Analyze electrical circuits through simulation	K4

**NAME OF THE COURSE: OPTO- ELECTRONICS & SEMICONDUCTORS LAB****COURSE CODE : V18PHL02****Course Outcomes:**

After successful completion of this course, the students will be able to

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
C01	Analyze the physical principle involved in the various instruments, also relate the principle to new application.	K4
C02	Demonstrate the various experiments in the areas of optics and Electronics in all branches of Engineering.	K3
C03	Think innovatively and also apply the creative skills that are essential for Engineering.	K4

## **NAME OF THE COURSE: ENGINEERING & IT WORKSHOP PRACTICE LAB**

**COURSE CODE : V18MEL01**

### **Engineering Workshop**

#### **Course Outcomes:**

After successful completion of the course, the student will be able to

**C01:** prepare different models in the carpentry trade such as Cross lap joint, Dove tail joint. **(K3)**

**C02:** make various basic prototypes in the trade of Tin smithy such as rectangular tray, and open Cylinder **(K3)**

**C03:**model various basic prototypes in the trade of fitting such as Straight fit, V-fit. **(K3)**

**C04:** prepare different models in the Black smithy such as Round rod to Square, S-Hook.. **(K3)**

**C05:** perform various basic House Wiring techniques such as connecting one lamp with one switch, connecting two lamps with one switch, connecting a fluorescent tube, Series wiring, Go down wiring. **(K3)**

**C06:** prepare various basic prototypes in the trade of Welding such as Lap joint, Butt joint. **(K3)**

### **IT WORKSHOP LAB**

#### **Course Outcomes:**

After successful completion of the course, the student will be able to

- Demonstrate Disassemble and Assemble a Personal Computer and its peripherals(K3)
- Practice installation of operating system.(K3)
- Connect peripherals and install required drivers(K4)
- Demonstrate internet connectivity and usage of internet as per his/her requirement.(K3)
- Prepare the Documents for their projects(K3)
- Prepare Slide shows for their presentations (K3)

### III-SEMESTER

NAME OF THE COURSE: ELECTRICAL CIRCUIT ANALYSIS-I

COURSE CODE : V18EET03

**Course Outcomes**

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C201.1	Apply various network reduction techniques for solving electrical circuits.	K3
C201.2	Apply the principles of magnetism for solving different kind of magnetic circuits with and without dot conventions.	K3
C201.3	Calculate different parameters of single phase alternating quantities.	K3
C201.4	Determine various parameters in series and parallel resonant circuits.	K3
C201.5	Apply the network theorems for solving electrical circuits.	K3
C201.6	Calculate two-port network parameters for any type of electrical networks	K3

NAME OF THE COURSE: ANALOG ELECTRONICS

COURSE CODE : V18ECT05

**COURSE OUTCOMES:**

**After successful completion of the course, the student will be able to:**

- CO 1: Explain the working principle of diode and Construct Diode rectifier circuits with and without filters. **[K2]**
- CO 2: Sketch V-I characteristics of BJT and FET in different configurations. **[K3]**
- CO 3: Explain the operation of Feedback Amplifiers and oscillators. **[K2]**
- CO 4: Construct wave shaping circuits for various applications **[K3]**
- CO 5: Construct circuits for different applications using ICs. **[K3]**
- CO 6: Explain the operation of Data Converters using IC 741 OP-AMP. **[K2]**

**NAME OF THE COURSE: ELECTRICAL MACHINES-I****COURSE CODE : V18EET04****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
<b>C203.1</b>	Understand the basic fundamentals of electromechanical energy conversion and various DC machines	K2
<b>C203.2</b>	Predict and mitigate the ill-effects of armature reaction and improve commutation in dc machines	K3
<b>C203.3</b>	Understand the torque production mechanism and control the speed of dc motors	K2
<b>C203.4</b>	Analyze the performance of single phase transformers	K4
<b>C203.5</b>	Calculate the regulation, losses and efficiency of single phase transformers	K3
<b>C203.6</b>	Understand the parallel transforms, control voltages with tap changing methods and achieve three phase to two phase transformation	K2

Activate Windows  
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After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
<b>C204.1</b>	Compute the electric field and potential due to different configurations of static charges and electric dipole.	K3
<b>C204.2</b>	Calculate the capacitance of various configurations and understand the concept of conduction and convection current densities.	K3
<b>C204.3</b>	Apply the Biot-Savart's law for finding MFI for different cables and develop the Maxwell's second equation.	K3
<b>C204.4</b>	Compute MFI for different cables by applying Ampere's circuital law and develop the Maxwell's third equation.	K3
<b>C204.5</b>	Determine the magnetic forces, torque produced by currents in magnetic fields, self-inductance of solenoid and toroid.	K3
<b>C204.6</b>	Calculate the induced E.M.F's and understand the concept of fields varying with time.	K3

**NAME OF THE COURSE: ELECTRICAL & ELECTRONIC MEASUREMENTS****COURSE CODE : V18EET06****Course Outcomes**

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C205.1	Identify the proper instrument for measurement of AC or DC voltage and current	K2
C205.2	Choose the suitable instrument for the measurement of power and energy.	K3
C205.3	Understand the operation of potentiometer.	K2
C205.4	Compute the electrical parameters by using appropriate bridge.	K3
C205.5	Calculate different magnetic parameters by using magnetic instruments and illustrate the instrument transformers.	K3
C205.6	Understand the operation of various digital instruments.	K2

**NAME OF THE COURSE: DATA STRUCTURES & ALGORITHMS LAB****COURSE CODE : V18CSL31****Course Outcomes: At the end of the Course student will be able to:**

- CO1:** Construct Sorting and searching methods. (K3)
- CO2:** Implement programs using Singly Linked Lists, Double Linked List. (K3)
- CO3:** Construct Basic Data Structures, Stacks, Queues and Applications. (K3)
- CO4:** construct Binary search tree (K3)
- CO5:** Implement various graph operations and shortest path algorithm. (K3)



## NAME OF THE COURSE: ANALOG ELECTRONICS LAB

COURSE CODE : V18ECL03

### COURSE OUTCOMES:

**After successful completion of the course, the student will be able to:**

CO-1: Interpret the Characteristics of various semiconductor devices. [K2]

CO-2: Examine the Performance of Rectifiers with and without Filters. [K3]

CO 3: Construct circuit for linear wave shaping circuits. [K3]

CO 4: Construct different RC and LC oscillators using BJT based on the frequency range.

[K3]

CO 5- Construct circuits for verifying linear and nonlinear applications using IC741op-amp

and IC 555 timer [K3]

CO 6- Verify the Characteristics of 4 bit Digital to Analog Converter [K3]

## NAME OF THE COURSE: PROFESSIONAL ETHICS & HUMAN VALUES

COURSE CODE : V18ENT12

### COURSE OUTCOMES:

**After successful completion of the course, the student will be able to:**

CO No.	Course Outcome	Knowledge Level
C212.1	Understand and assimilate human values to grow as responsible human beings with proper personality.	K2
C212.2	Understand different ethical theories	K2
C212.3	Interpret engineering as social experiment	K2
C212.4	Explain Engineers' responsibilities towards Safety and Risk	K2
C212.5	Understand ethical conduct and discharge their professional duties	K2
C212.6	Understand ethics in view of globalization	K2

## NAME OF THE COURSE: PROFESSIONAL COMMUNICATION SKILLS-I

COURSE CODE : V18ENT03

### **COURSE OUTCOMES:**

**After successful completion of the course, the student will be able to:**

**CO1:** Summarize one's introduction in an appropriate manner, exhibit grammatical competence through correction of sentences, analyze noun and pronoun dispositions and develop pre-reading strategies to improve comprehension skills.[K5]

**CO2:** Distinguish singular and plural in different contexts and display knowledge through accurate usage of sentences, build conversations which befit the situations, comprehend the passages well and, use different kinds of idioms. [K4]

**CO3:** Classify various kinds of adjectives and adverbs, learn natural occurrence of paired words of native speakers, infer the referential and inferential aspects of the passages and make use of idioms while narrating personal experiences. [K4]

**CO4:** Judge and assess the behaviour of people in day to day life using kinesics and proxemics that disclose their disposition and be aware of their personal traits that promote good relations. (K2)

**CO5:** Articulate their goals and have a constructive plan of executing them properly and become adept in oral presentations as well as poster presentations that enhance their professional skills. (K3)

**CO6:** Evaluate various happenings by thinking out of the box and display their latent talent. They can also reduce the stress levels by applying various stress management techniques. (K4)

## IV-SEMESTER

**NAME OF THE COURSE: ELECTRICAL CIRCUIT ANALYSIS-II**

**COURSE CODE : V18EET07**

### **Course Outcomes**

After successful completion of this course, students will be able to

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C210.1</b>	Compute electrical parameters for 3-phase balanced systems	K3
<b>C210.2</b>	Determine electrical parameters for 3-phase unbalanced systems	K3
<b>C210.3</b>	Analyse circuit parameters under transient conditions	K3
<b>C210.4</b>	Apply Foster and Cauer methods for Network Synthesis	K3
<b>C210.5</b>	Apply Fourier Series and Transforms for analysing electrical circuits	K3
<b>C210.6</b>		K3

**NAME OF THE COURSE: DIGITAL ELECTRONICS**

**COURSE CODE : V18EET08**

### **Course Outcomes**

After successful completion of this course, students will be able to

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C211.1</b>	Understand various number systems, conversion from one radix to another radix.	K2
<b>C211.2</b>	Solve the boolean functions using K-map and tabular minimization	K3
<b>C211.3</b>	Construct the combinational logic circuits	K3
<b>C211.4</b>	Apply PLD's for realization of Boolean	K3
<b>C211.5</b>	Develop the sequential logic circuits such as flip flops, counters and registers.	K3
<b>C211.6</b>	Analyse clocked sequential circuits, finite state machines, Mealy to Moore conversion and vice-versa.	K4

**NAME OF THE COURSE: ELECTRICAL MACHINES-II****COURSE CODE : V18EET09****Course Outcomes**

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
<b>C212.1</b>	Explain the operation and performance of three phase induction motor	K3
<b>C212.2</b>	Analyze the torque-speed relation, performance of induction motor and induction generator	K4
<b>C212.3</b>	Explain the torque production mechanism and starting of single phase induction motors	K3
<b>C212.4</b>	Analyze the performance of synchronous generators by determining its voltage regulation.	K4
<b>C212.5</b>	Examine the parallel operation and control of real and reactive powers for synchronous generators.	K3
<b>C212.6</b>	Understand the operation, performance, starting and power factor corrections of synchronous motors and Mathematical Analysis of power developed, hunting and its suppression	K4

**NAME OF THE COURSE: PROBABILITY & STATISTICS****COURSE CODE : V18MAT04****Course Outcomes: At the end of the Course student will be able to:**

- CO1:** Find measures of central tendency and dispersion for real data sets.
- CO2:** Find parameters of given function
- CO3:** Apply probability distribution to real time problems
- CO4:** Plot a best fit curve to an experimental data and find the correlation and regression
- CO5:** Create good estimators to various parameters
- CO6:** Apply the principles of Statistical Inference to practical problems

**NAME OF THE COURSE: ELECTRICAL POWER GENERATION & TRANSMISSION****COURSE CODE : V18EET10****Course Outcomes**

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C214.1	Understand the working of conventional power generating stations	K2
C214.2	Choose the proper turbine for a particular power generating station	K3
C214.3	Calculate the performances parameters of various load and insulation resistance and power factor of the cables.	K3
C214.4	Compute the resistance, inductance and capacitance of transmission lines	K3
C214.5	Determine the various transmission line parameters	K3
C214.6	Understand different effects occurred and calculate the corona loss, sag and tension in transmission lines	K3

**NAME OF THE COURSE: ELECTRICAL CIRCUITS & MEASUREMENTS LAB****COURSE CODE : V18EEL04****Course Outcomes**

After successful completion of this course, the students will be able to

CO No.	Course Outcome	Knowledge Level
C215.1	Compute response in the electrical circuits using various Network theorems and determine two port network parameters	K3
C215.2	Sketch Locus Diagrams of RL and RC Series Circuits	K3
C215.3	Find parameters of the circuit under resonance conditions	K3
C215.4	Analyse the measuring parameters of Anderson & Schering bridge.	K3
C215.5	Calibrate voltmeters, ammeters, single phase energy meters	K3
C215.6	Apply various methods to calculate 3phase power and choke coil parameters	K3

**NAME OF THE COURSE: ELECTRICAL MACHINES LABORATORY- I****COURSE CODE : V18EEL05****Course Outcomes**

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
<b>C216.1</b>	Apply and Deduce the principles of Electrical Machines through laboratory experimental work	K3
<b>C216.2</b>	Connect the circuit to perform experiments and measure the required parameters	K3
<b>C216.3</b>	Analyse the observed data & come to a conclusion	
<b>C216.4</b>	Organize reports based on performed experiments with effective demonstration of diagrams and characteristics /graph	K4
<b>C216.5</b>	Demonstrate the performance of Electrical Machines.	K4
<b>C216.6</b>	Troubleshoot the operation of Electrical machines.	K3

**NAME OF THE COURSE: PYTHON PROGRAMMING LAB****COURSE CODE : V18CSL33****COURSE OUTCOMES:****After successful completion of the course, the student will be able to:**

- CO1:** Demonstrate Basic Python Programs **[K3]**
- CO2:** Construct control structures in python **[K3]**
- CO3:** Demonstrate functions and packages. **[K3]**
- CO4:** Construct python programs using structured data types. **[K3]**
- CO5:** Demonstrate Text Files **[K3]**



**NAME OF THE COURSE: ELECTRICAL SAFETY & IE RULES****COURSE CODE : V18EET56****Course Outcomes**

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
<b>C218.1</b>	Understand the types of electrical hazards and its impact on human body	K2
<b>C218.2</b>	Identify various electrical safety equipment required in power industries.	K2
<b>C218.3</b>	Explain different types of safety methods needed for safe operation of power system	K2
<b>C218.4</b>	Demonstrate the electrical accident rescue techniques and required first aid	K3
<b>C218.5</b>	Understand the departmental procedure for obtaining service connection	K2
<b>C218.6</b>	Describe various IE rules in Indian Electricity Act	K2

**NAME OF THE COURSE: PROFESSIONAL COMMUNICATIONS SKILLS-II****COURSE CODE : V18ENT04****COURSE OUTCOMES:****After successful completion of the course, the student will be able to:**

**CO1:** Correlate individual words into one whole sentence using new vocabulary and focus on the error analysis of prepositions and conjunctions. **[K4]**

**CO2:** Distinguish and acquire knowledge of using words of same category in a sentence and learn new words that promote communicative finesse. **[K5]**

**CO3:** Find errors in sentences where the modifiers are misplaced and put them at the appropriate place, use hit pair words and send an email that is concise and lucid **[K5]**

**CO 4:** Interpret the importance of Attire and Etiquette in societal context and manage their time. **[K2]**

**CO5:** Discover the team working abilities among themselves and display their leadership qualities. **[K3]**

**CO6:** Identify various elements of emotional balance that have positive impact on work-life-balance. **[K2]**



## V-SEMESTER

**NAME OF THE COUSE: SWITCH GEAR & PROTECTION**

**COURSE CODE : V18EET12**

### Course Outcomes

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C301.1	Understand the arc interruption phenomenon in circuit breakers of oil, air, vacuum, SF6 gas type.	(K2)
C301.2	Extract the constructional features and working of different types of electromagnetic relays	(K2)
C301.3	Use suitable relay for different types of protection	(K3)
C301.4	Relate protective schemes of generators and transformers against different faults	(K3)
C301.5	Apply suitable protective scheme for the protection of feeders & bus bars	(K3)
C301.6	Illustrate the operation of static & digital relays and the concept of grounding	(K2)

**NAME OF THE COURSE: POWER ELECTRONICS**

**COURSE CODE : V18EET13**

### Course Outcomes

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C302.1	Sketch the characteristics of various power semiconductor devices and Illustrate various firing circuits for SCR.	(K3)
C302.2	Operate various 1-phase AC-DC Controlled rectifiers for R and RL Loads and compare their performances.	(K3)
C302.3	Operate various 3-phase AC-DC Controlled rectifiers for R and RL Loads and compare their performances.	(K3)
C302.4	Understand the operation of various DC-DC Converters.	(K2)
C302.5	Explain the working of AC-AC Regulators and Estimate their output voltages.	(K3)
C302.6	Understand the operation of various DC-AC Converters for R & RL Loads.	(K2)

**NAME OF THE COURSE: POWER SYSTEM ANALYSIS****COURSE CODE : V18EET14****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C303.1	Compute $Y_{BUS}$ matrix for a power system network	(K3)
C303.2	Find the load flow solution of a power system network using load flow methods	(K3)
C303.3	Develop the $Z_{BUS}$ for a power system network	(K3)
C303.4	Calculate the fault currents for symmetrical faults	(K3)
C303.5	Compute the sequence components of currents for unbalanced power system network	(K3)
C303.6	Understand the concepts of power system stability	(K2)

**NAME OF THE COURSE: CONTROL SYSTEMS****COURSE CODE : V18EET15****Course Outcomes**

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C304.1	Determine the mathematical modelling of physical systems	(K3)
C304.2	Calculation of Time Domain Specification of first and second order systems and understand the effect of Controllers	(K3)
C304.3	Investigate the stability of closed loop systems using Routh's stability criterion and root locus method.	(K3)
C304.4	Find the stability of control systems using frequency response approaches.	(K3)
C304.5	Discuss the basic aspects of design and compensation of linear control systems using bode plot.	(K3)
C304.6	Analyze physical systems using state space approach.	(K4)

**NAME OF THE COURSE: SIGNALS & SYSTEMS****COURSE CODE : V18EET16****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C305.1	Understand and estimate various types of signals and systems.	(K2)
C305.2	Understand the basic principles of Sampling Theorem.	(K2)
C305.3	Understand the characteristics of LTI and LTV Systems and Determine the Transfer Function of LTI.	(K3)
C305.4	Understand the concepts of Cross-Correlation and Auto-Correlation of Functions	(K2)
C305.5	Differentiate Laplace Transform, Fourier Transform and apply the concept of Laplace Transform to certain signals using waveform synthesis.	(K4)
C305.6	Distinguish Laplace Transform, Fourier Transform and Z-Transforms by understanding the principles and properties of Z-Transform and its Inverse Transform.	(K4)

**NAME OF THE COURSE: MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS****COURSE CODE : V18MBT51****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C306.1	Understand the basic concepts of managerial economics, demand, and elasticity of demand and methods of demand forecasting.	(K2)
C306.2	Estimate the production function with one, two and infinite variables. Understand various cost concepts and calculating breakeven point	(K2)
C306.3	Understand and showing a price output determination in different types of market structures and knowing various pricing methods	(K2)
C306.4	Understand various forms of business organizations	(K2)
C306.5	Prepare financial statements and its analysis.	(K3)
C306.6	Appraise the projects by using various capital budgeting methods	(K4)

**NAME OF THE COURSE: ELECTRICAL MACHINES LABORATORY-II****COURSE CODE : V18EEL06****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
<b>C307.1</b>	Pre-determine the performance parameters of 3-phase induction motor by conducting no-load and blocked rotor tests.	(K3)
<b>C307.2</b>	Sketch the performance characteristics of 3-phase induction motor by conducting brake test.	(K3)
<b>C307.3</b>	Pre-determine the performance parameters of cylindrical pole synchronous machine by conducting OC and SC tests.	(K3)
<b>C307.4</b>	Determine the direct and quadrature axis reactances by conducting slip test.	(K3)
<b>C307.5</b>	Determine V and inverted V curves through synchronization of synchronous machine to mains.	(K3)
<b>C307.6</b>	Calculate the equivalent circuit parameters of a 1-phase transformer by conducting OC and SC Tests.	(K3)

**NAME OF THE COURSE: CONTROL SYSTEMS LABORATORY****COURSE CODE : V18EEL07****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
<b>C308.1</b>	Find time response of given control system model.	(K3)
<b>C308.2</b>	Analyze the performance and working of Magnetic amplifier, D.C. servo motors, A.C. Servo motors and synchronous motors.	(K4)
<b>C308.3</b>	Analyze PID controllers for given control system model.	(K4)
<b>C308.4</b>	Analyze lead, lag and lead-lag systems in control system	(K4)
<b>C308.5</b>	Determine the transfer function of D.C. motor and D.C Generator.	(K4)
<b>C308.6</b>	Examine the control of temperature using PID controller.	(K3)

**NAME OF THE COURSE: PROFESSIONAL COMMUNICATION SKILLS-III****COURSE CODE : V18ENT05****COURSE OUTCOMES**

	After successful completion of the course, students will be able to	Knowledge Level
<b>CO1</b>	Distinguish the subtle meanings of various words in different contexts, recognize similar words as well as words with contrast meanings and use them appropriately.	K2
<b>CO2</b>	Interpret the passage using different strategies and answer the questions with ease.	K3
<b>CO3</b>	Compare different pairs of words and draw analogy between the words. Choose an appropriate word to make a sentence meaningful.	K4
<b>CO4</b>	Recognize the easiest and best possible way of solving problems in the area of Number and Letter Series, Analogy, Classification, Coding & Decoding Symbols, Ranking and Analytical Reasoning.	K1
<b>CO5</b>	Investigate the different types of logics involved in Mirror and Water Images, Logical Reasoning & Arithmetical Reasoning.	K4
<b>CO6</b>	Find the common traps in the questions and errors likely to be made from the concepts of Blood Relations, Directions, Average, Clock and Calendar, Data Sufficiency, Permutations-Combinations and Probability.	K3

## VI-SEMESTER

**NAME OF THE COURSE: ELECTRICAL DRIVES**

**COURSE CODE : V18EET17**

### Course Outcomes

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
<b>C311.1</b>	Understand the fundamentals concept about an electric drive and different electric braking methods	(K2)
<b>C311.2</b>	Operate Chopper fed DC motor drives in various quadrants	(K4)
<b>C311.3</b>	Understand the closed loop operation of chopper fed dc motor drives	(K2)
<b>C311.4</b>	Compute the change in speed of three phase induction motor using solid state converters	(K3)
<b>C311.5</b>	Illustrate the speed control of induction motor using scalar control methods	(K3)
<b>C311.6</b>	Analyze the speed control of induction motor using rotor resistance control and various slip power recovery schemes	(K4)

**NAME OF THE COURSE: FUNDAMENTALS OF MICROPROCESSORS & MICROCONTROLLERS**

**COURSE CODE : V18ECT23**

**Course Outcomes: After Successful completion of the Course, the student will be able to:**

**CO-1:**Describe the basic architecture of 8086 microprocessor along with signal Descriptions modes of operation ,stack structure and interrupt responses**(K2)**.

**CO-2:**Construct assembly language programs using the concepts of addressing Modes and instructions with a programming tool- **(K3)**.

**CO-3:**Demonstrate interfacing of 8086 with memory and programmable peripheral Devices- **(K3)**.

**CO-4:**Examine the Architecture and operation of 8051 Microcontrollers, timers and ports **(K2)**

**CO-5:**Explain about PIC Microcontrollers with their architecture - **(K2)**.

**CO-6:**Describe the Data types, I/O programming, logical operations, data conversion **(K2)**

**NAME OF THE COURSE: UTILIZATION OF ELECTRICAL ENERGY****COURSE CODE : V18EET18****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C311.1	Choose a suitable motor for electric drives and industrial applications	(K3)
C311.2	Identify appropriate heating techniques for different applications	(K3)
C311.3	Identify appropriate welding techniques for different applications	(K3)
C311.4	Recognise lightning system for particular inputs and constraints in view	(K2)
C311.5	Determine the speed-time characteristics of traction motors	(K3)
C311.6	Estimate energy consumption levels at various modes of operation	(K3)

**NAME OF THE COURSE: ADVANCED CONTROL SYSTEMS****COURSE CODE : V18EET19****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C311.1	Understand the concepts of State Space Analysis	(K2)
C311.2	Find the concepts of Controllability, Observability and development of pole placement techniques	(K3)
C311.3	Demonstrate the non-linear systems behaviour by Phase Plane and describing function analysis	(K3)
C311.4	Compute the stability of linear and non-linear systems by Lypunov's Method	(K3)
C311.5	Illustrate the principle of Calculus of Variation, Optimality and its Applicants	(K3)
C311.6	Develop the Linear quadratic Regulator (LQR) and Optimal regulator design by using Lypunov's Method	(K3)



**NAME OF THE COURSE: RENEWABLE ENERGY SYSTEMS****COURSE CODE : V18EET20****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
<b>C311.1</b>	Understand the solar radiation and calculate geometric angle	(K3)
<b>C311.2</b>	Understand the working of solar thermal collectors	(K2)
<b>C311.3</b>	Understand the working of solar photo voltaic systems and develop the maximum power point techniques	(K3)
<b>C311.4</b>	Understand the wind energy conversion systems ,Betz coefficient and tip speed ratio	(K2)
<b>C311.5</b>	Understand the basic principle and working of hydro and tidal systems.	(K2)
<b>C311.6</b>	Understand the basic principle and working of, biomass, fuel cell and geothermal systems.	(K2)

**NAME OF THE COURSE: ADVANCED POWER ELECTRONICS****COURSE CODE : V18EET21****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
<b>C309.1</b>	Analyze and design power converter configurations for specific applications	(K3)
<b>C309.2</b>	Design power electronic converters to improve power quality	(K3)
<b>C309.3</b>	Analyze and design resonant converters	(K3)
<b>C309.4</b>	Develop power converter models under steady state and small signal conditions	(K3)
<b>C309.5</b>	Determine duty cycle and transfer functions for buck, boost and buck-boost converters	(K3)
<b>C309.6</b>	Synthesize and design magnetic components for power converters	(K4)

**NAME OF THE COURSE: HVAC & HVDC TRANSMISSION****COURSE CODE : V18EET22****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C312.1	Calculate electrical parameters of EHVAC lines	(K3)
C312.2	Compute corona loss , radio interference and excitation function	(K3)
C312.3	Understand the phenomena of HVDC transmission systems	(K2)
C312.4	Choose suitable converter configuration for HVDC converters and system control	(K4)
C312.5	Understand the requirements of reactive power control in HVDC systems	(K2)
C312.6	Calculate various parameters required for designing filters	(K3)

**NAME OF THE COURSE: PROGRAMMABLE LOGIC CONTROLLERS & ITS APPLICATIONS****COURSE CODE : V18EET23****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C312.1	Understand working of PLC, I/O Modules of PLC and PLC Ladder design	(K2)
C312.2	Understand different types of devices to which PLC Input and Output modules are connected	(K2)
C312.3	Apply of PLC timers and counters for the control of Industrial process	(K3)
C312.4	Illustrate the program control instructions	(K3)
C312.5	Demonstrate the Data Manipulation, Arithmetic, Logical and Sequential Instructions of PLC's	(K3)
C312.6	Development of different Applications using PLC's	(K3)

**NAME OF THE COURSE: ELECTRICAL ENERGY CONSERVATION, MANAGEMENT & AUDITING**

**COURSE CODE : V18EET24**

**Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C312.1	Describe the concepts and procedures for Energy Audit & Management	(K2)
C312.2	Understand the necessity of Energy efficient lighting systems	(K2)
C312.3	Understand the operation of Energy instruments and their use in energy audit	(K2)
C312.4	Explain Energy Conservation measures in HVAC system	(K2)
C312.5	Understand various economic aspects of Energy systems	(K2)
C312.6	Apply life cycle costing analysis for various system or organizations	(K3)

**NAME OF THE COURSE: SPECIAL ELECTRICAL MACHINES**

**COURSE CODE : V18EET25**

**Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C312.1	Describe the operation and characteristics of permanent magnet dc motor	(K2)
C312.2	Understand the operation and control of stepper motors	(K2)
C312.3	Understand the operation and control of switched reluctance motor	(K2)
C312.4	Describe the operation and characteristics of brush less dc motor	(K2)
C312.5	Distinguish between square wave and sine wave brush less dc motor	(K3)
C312.6	Understand the construction and operation of linear induction motors	(K2)

**NAME OF THE COURSE: POWER ELECTRONICS LABORATORY****COURSE CODE : V18EEL08****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C313.1	Sketch the characteristics of various power electronics devices and analyse the firing circuits	(K4)
C313.2	Analyze the performance of 1-phase and 3-phase full converter and 1-phase dual converter for resistive and inductive loads	(K4)
C313.3	Experiment the single phase AC voltage controller and cyclo converter with resistive and inductive loads.	(K4)
C313.4	Operate the DC-DC buck converter and boost converter	(K3)
C313.5	Analyze the performance of the single phase bridge inverter	(K4)
C313.6	Analyze the performance of the PWM inverter	(K4)

**NAME OF THE COURSE: ELECTRICAL SIMULATION LABORATORY****COURSE CODE : V18EEL09****Course Outcomes**

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C314.1	Simulate integrator circuit, differentiator circuit	(K3)
C314.2	Simulate Boost converter, Buck converter, full convertor and PWM inverter	(K3)
C314.3	Simulate transmission line by incorporating line, load and transformer models	(K3)
C314.4	Plot of Bode plots, root locus and nyquist plots	(K3)
C314.5	Perform transient analysis of RLC circuit	(K3)
C314.6	Perform transient analysis of single machine connected to infinite bus(SMIB)	(K4)

**NAME OF THE COURSE: MICROPROCESSORS & MICROCONTROLLERS LAB****COURSE CODE : V18ECL10****Course Outcomes: After Successful completion of the Course, the student will be able to:****CO-1:** Develop algorithm and logic for different operations using 8086 Instructions. **(K3)****CO-2:** Construct simple programs for 8086 using Assembler directives (MASM)/Machine control Instructions. **(K3)****CO-3:** Develop ALP to perform arithmetic and logical operations using various instructions. **(K3)****CO-4:** Develop ALP to perform conversions, finding squares of a numbers by using Loop, Jump instructions. **(K3)****CO-5:** Develop the ALP to Interface the various peripherals to 8086 microprocessors. **(K3)****CO-6:** Develop ALP to perform arithmetic and logical operations using 8051 Microcontroller Instruction set **(K3)****NAME OF THE COURSE: PROFESSIONAL COMMUNICATION SKILLS-IV****COURSE CODE : V18ENT06****COURSE OUTCOMES**

	After successful completion of the course, the students will be able to	Knowledge Level
<b>CO1</b>	Express writer's tone and relevant ideas using different types of writing skills and prepare resume to show case skills and accomplishments.	<b>K2</b>
<b>CO2</b>	Organize thoughts in the discussions and express views without reticence and face interviews with aplomb.	<b>K3</b>
<b>CO3</b>	Infer the meaning of the picture by thinking out of the box and speak without inhibitions.	<b>K4</b>
<b>CO4</b>	Demonstrate problem solving skills through the concepts of Percentages, Profit and loss, Simple Interest & Compound Interest and Allegation.	<b>K3</b>
<b>CO5</b>	Analyze appropriate methods of logical thinking on Ratio and Proportion, Partnership, LCM and HCF, Number System, Areas & Volumes.	<b>K4</b>
<b>CO6</b>	Calculate the end results of Cubes, Dice and Data Analysis, Time & Work, Time & Distance, Race & Games.	<b>K4</b>

**NAME OF THE COURSE: BASIC MECHANICAL ENGINEERING**

**COURSE CODE : V18MEOE1**

Course Outcomes:

After successful completion of the course, the student will be able to,

CO1	Understand classification and working of major components in thermal power plants.	K2
CO2	Discuss various metal joining processes	K2
CO3	Classify types of air compressors and refrigeration systems.	K2
CO4	Illustrate the working of internal combustion engines	K2
CO5	Understand basics of heat transfer	K2
CO6	Discuss about functions and operations of machine tools including milling, shaping, grinding and lathe machines	K2

**NAME OF THE COURSE: GREEN ENGINEERING SYSTEMS****COURSE CODE : V18MEOE2**

Course Outcomes:

After successful completion of the course, the student will be able to,

CO1	Understand about solar radiation and its collection	K2
CO2	Discuss about various solar energy storage systems and applications.	K2
CO3	Explain about bio-mass, geothermal energy and ocean energy	K2
CO4	Classify the energy efficient systems.	K2
CO5	Describe different energy efficient processes.	K2
CO6	Discuss about features of green buildings	K2

**NAME OF THE COURSE: INTRODUCTION TO ROBOTICS****COURSE CODE : V18MEOE3**

Course Outcomes:

After successful completion of the course, the student will be able to,

CO1	Explain various automations and components.	K2
CO2	Discuss the anatomy of the robot with its components	K2
CO3	Illustrate robot configurations	K3
CO4	compute trajectory planning system	K3
CO5	Discuss various robot actuation and feedback sensors	K2
CO6	Explain different robot applications in industrial purpose	K2

## **NAME OF THE COURSE: INTERNET OF THINGS**

**COURSE CODE : V18ECTOE1**

**Course Outcomes: After Successful completion of the Course, the student will be able to:**

- CO- 1:** Describe M2M and IOT Technologies. (K2)
- CO- 2:** Identify the layers and protocols in IOT. (K2)
- CO- 3:** Describe various communication technologies used in IOT. (K2)
- CO- 4:** Demonstrate various hardware components required for IOT applications. (K2)
- CO- 5:** Identify the cloud technologies. (K2)
- CO- 6:** Explain the applications of IoT. (K2)

## **NAME OF THE COURSE: PRINCIPLES OF COMMUNICATION SYSTEMS**

**COURSE CODE : V18ECTOE2**

**Course Outcomes: After Successful completion of the Course, the student will be able to:**

- CO-1:** Demonstrate the fundamentals of communication systems ( K2 )
- CO-2:** Compare the various analog modulation and demodulation schemes ( K2 )
- CO-3:** Compare the various digital modulation and demodulation schemes ( K2 )
- CO4:** Explain the wireless communication system concepts( K2 )
- CO-5:** outline the satellite communication system principles ( K2 )
- CO-6:** outline the Optical communication system principles ( K2 )

## **NAME OF THE COURSE: INTRODUCTION TO VLSI DESIGN**

**COURSE CODE : V18ECTOE3**

**Course Outcomes: After Successful completion of the Course, the student will be able to:**

- CO1:** Demonstrate the fundamentals of IC technology such as various MOS fabrication technologies. (K2)
- CO2:** Compute electrical properties of MOS circuits such as  $I_{ds} - V_{ds}$  relationship, And MOS circuit parameters (K3)
- CO3:** Develop stick diagrams, layouts using design rules of various MOS Technologies. (K3)
- CO4:** Compute the sheet resistance, area capacitance of various MOS layers And inverter delays.(K3)
- CO5:** Explain the various MOS circuit parameters scaling and assess the Effects of scaling.(K2)
- CO6:** Demonstrate VHDL synthesis, simulation, design capture tools design Verification tools.(K2)



**NAME OF THE COURSE: DATABASE MANAGEMENT SYSTEMS**

**COURSE CODE : V18CSTOE01**

**Course Outcomes: After Successful completion of the Course, the student will be able to:**

**CO1:** Demonstrate Database Systems, various Data Models and Database Architecture. (K2)

**CO2:** Apply ER Modeling to Design Relational Databases for Real Time Applications. (K3)

**CO3:** Apply SQL Constructs to Perform Database Operations. (K3)

**CO4:** Apply Normalization Techniques to Refine Schema. (K3)

**CO5:** Explain Transaction Management and Concurrency Control. (K2)

**CO6:** Experiment with various database indexing techniques. (K3)

**NAME OF THE COURSE: SOFTWARE ENGINEERING**

**COURSE CODE : V18CSTOE02**

**Course Outcomes: After Successful completion of the Course, the student will be able to:**

**CO1:** Demonstrate Software Process Models. (K3)

**CO2:** Illustrate Requirement Engineering Process. (K3)

**CO3:** Discuss Software architecture and Design. (K2)

**CO4:** Apply Coding principles and Testing techniques. (K3)

**CO5:** Discuss Software Estimation and Maintenance. (K2)

**CO6:** Describe Quality Management and Metrics. (K2)

**NAME OF THE COURSE: PYTHON PROGRAMMING**

**COURSE CODE : V18CSTOE03**

**Course Outcomes: After Successful completion of the Course, the student will be able to:**

**CO1:** Illustrate basic concepts of Python Programming (K2)

**CO2:** Describe control structures in python (K2)

**CO3:** Demonstrate functions and packages. (K3)

**CO4:** Construct python programs using structured data types. (K3)

**CO5:** Compare TextFiles and Binary Files (K4)

**CO6:** Apply OOPs concepts to Develop Test cases (K3)

## VII-SEMESTER

**NAME OF THE COURSE: POWER SYSTEM OPERATION & CONTROL**

**COURSE CODE : V18EET26**

**Course Outcomes:**

**After successful completion of this course, the students will be able to**

CO No.	Course Outcome	Knowledge Level
C01	Analyze the optimal scheduling of power generating thermal units	K4
C02	Compute optimal hydro and thermal scheduling.	K3
C03	Predict the optimal unit commitment problem	K3
C04	Calculate the transfer function of single area and two area load frequency control.	K4
C05	Evaluate the steady state response of single area load control with PI controller.	K5
C06	Assess the reactive power control and compensation of transmission lines.	K3

**NAME OF THE COURSE: AI TECHNIQUES FOR POWER SYSTEM**

**COURSE CODE : V18EET27**

**Course Outcomes:**

**After successful completion of this course, the students will be able to**

CO No.	Course Outcome	Knowledge Level
C01	Understand fundamentals concepts of artificial neural networks.	K2
C02	Understand concepts of different algorithms ANN paradigms.	K2
C03	Understand fundamentals of fuzzy set properties and membership functions.	K2
C04	Understand the concept of evolutionary techniques operation.	K2
C05	Understand fundamentals of optimization techniques.	K2
C06	Apply optimization techniques to power system applications.	K4

**NAME OF THE COURSE: POWER QUALITY****COURSE CODE : V18EET28****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Explain different types of power quality phenomena	<b>K2</b>
<b>C02</b>	Illustrate sources for voltage sag, voltage swell, interruption, transients, long duration over voltages & harmonics in a power system	<b>K3</b>
<b>C03</b>	Describe power quality terms & study power quality standards	<b>K2</b>
<b>C04</b>	Discuss principle of voltage regulation & power factor improvement methods	<b>K2</b>
<b>C05</b>	Assess the relationship between distributed generation & power quality	<b>K3</b>
<b>C06</b>	Discuss the power quality monitoring concepts & the usage of measuring instruments	<b>K2</b>

**NAME OF THE COURSE: HIGH VOLTAGE ENGINEERING****COURSE CODE : V18EET29****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Describe the electric field stress on different configuration of electrodes.	<b>K2</b>
<b>C02</b>	Understand the breakdown phenomena in various dielectric materials.	<b>K2</b>
<b>C03</b>	Illustrate the generation of high DC, AC and Impulse voltages and Currents.	<b>K2</b>
<b>C04</b>	Explain various methods available for measurement of high DC, AC and Impulse voltages and currents.	<b>K2</b>
<b>C05</b>	Describe different methods for measuring DC Resistivity, Dielectric Constant, Loss Factor & explain the phenomena of Partial Discharge.	<b>K2</b>
<b>C06</b>	Illustrate the testing techniques for various equipment's used in High Voltage Engineering.	<b>K2</b>

**NAME OF THE COURSE: MODELLING & SIMULATION OF POWER ELECTRONICS****COURSE CODE : V18EET30****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Understand the background activities i.e. numerical solution used in the simulation software.	<b>K3</b>
<b>C02</b>	Describe the transient analysis in circuit simulation	<b>K2</b>
<b>C03</b>	Explain the concepts of simulation of power electronic converters	<b>K2</b>
<b>C04</b>	Compute properties of switching functions in single and parallel switch	<b>K3</b>
<b>C05</b>	Express mathematical modelling of different converters	<b>K2</b>
<b>C06</b>	Develop state space averaging technique and Hybrid Modelling for DC-DC converter	<b>K3</b>

**NAME OF THE COURSE: FLEXIBLE AC TRANSMISSION SYSTEMS****COURSE CODE : V18EET31****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Determine power flow control in transmission lines by using FACTS controllers.	<b>K3</b>
<b>C02</b>	Explain operation and control of voltage source converter.	<b>K2</b>
<b>C03</b>	Discuss compensation methods to improve stability and reduce power oscillations in the transmission lines.	<b>K2</b>
<b>C04</b>	Explain the method of shunt compensation by using static VAR compensators.	<b>K2</b>
<b>C05</b>	Appreciate the methods of compensations by using series compensators..	<b>K3</b>
<b>C06</b>	Explain the operation of two modern power electronic controllers (Unified Power Quality Conditioner and Interline Power Flow Controller)	<b>K2</b>

**NAME OF THE COURSE: MODERN CONTROL THEORY****COURSE CODE : V18EET32****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Describe and analyse systems in state space model	<b>K2</b>
<b>C02</b>	Model a system in various canonical forms	<b>K3</b>
<b>C03</b>	Design a controller and observer using state feedback	<b>K4</b>
<b>C04</b>	Analyse non-linear system using describing functions	<b>K3</b>
<b>C05</b>	Analyse non-linear system using Phase plane analysis	<b>K3</b>
<b>C06</b>	Analyse non-linear system using Lypanov method	<b>K3</b>

**NAME OF THE COURSE: SMART GRID****COURSE CODE : V18EET33****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Understand concept of smart grid and its advantages over conventional grid.	<b>K2</b>
<b>C02</b>	Explain the architecture of smart Grid	<b>K2</b>
<b>C03</b>	Illustrate the concept of Micro Grid and its integration	<b>K3</b>
<b>C04</b>	Understand smart metering techniques and measuring techniques	<b>K2</b>
<b>C05</b>	Examine different communication technologies that can be used for smart grid	<b>K3</b>
<b>C06</b>	Identify the power quality problems associated with smart grid	<b>K2</b>

**NAME OF THE COURSE: ELECTRICAL MACHINE MODELLING & ANALYSIS****COURSE CODE : V18EET34****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Analyze Kroon's Primitive Machine	K2
<b>C02</b>	Develop modeling of dc machine	K3
<b>C03</b>	Explain linear Transformation	K4
<b>C04</b>	Apply mathematical modeling concepts to 3-phase Induction machines	K3
<b>C05</b>	Design control strategies based on dynamic modeling of 3-ph Induction machines and 3-phase Synchronous machine	K4
<b>C06</b>	Analyze BLDC Machine and switched reluctance machine based on Mathematical modeling of BLDCM and SRM	K4

**NAME OF THE COURSE: CONTROL OF GRID CONNECTED CONVERTERS FOR PV & WIND ENERGY SYSTEMS****COURSE CODE : V18EET35****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Understand the basic requirements of grid for connecting PV and WT converters.	K2
<b>C02</b>	Describe various grid synchronization techniques for single phase power converters.	K2
<b>C03</b>	Describe various grid synchronization techniques for three phase power converters.	K2
<b>C04</b>	Illustrate various filter topologies and control techniques for grid connected converters.	K2
<b>C05</b>	Explain different MPPT Control Methods and limitations of standard MPPT.	K2
<b>C06</b>	Illustrate the control of grid converter for renewable energy interface	K2

**NAME OF THE COURSE: POWER SYSTEMS LAB**

**COURSE CODE : V18EEL10**

**Course Outcomes:**

**After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Calculate the sequence impedances of 3 phase Transformer	<b>K4</b>
<b>C02</b>	Determine the power Angle Characteristics of 3-phase Alternator with infinite bus bars	<b>K4</b>
<b>C03</b>	Calculate the dielectric strength of Transformer oil	<b>K4</b>
<b>C04</b>	Explain load flow studies using N-R method	<b>K5</b>
<b>C05</b>	Assess load frequency control with & without controller	<b>K5</b>
<b>C06</b>	Evaluate economic load dispatch with & without losses	<b>K5</b>

## VIII-SEMESTER

**NAME OF THE COURSE: ELECTRICAL DISTRIBUTION SYSTEMS**

**COURSE CODE : V18EET36**

**Course Outcomes:**

**After successful completion of this course, the students will be able to**

CO No.	Course Outcome	Knowledge Level
C01	Understand various factors of distribution system	K2
C02	Construct the distribution substation and feeders	K3
C03	Calculate the voltage drop and power loss calculations on Distribution System	K3
C04	Understand the distribution system protection and its coordination.	K2
C05	Understand the effect of compensation for power factor improvement.	K2
C06	Understand the effect of voltage control on distribution system.	K2

**NAME OF THE COURSE: DIGITAL SIGNAL PROCESSING**

**COURSE CODE : V18EET37**

**Course Outcomes:**

**After successful completion of this course, the students will be able to**

CO No.	Course Outcome	Knowledge Level
C01	Classify Discrete Time Signals, systems, estimate the response of various Systems	K2
C02	Compute DFT for discrete time signals using FFT Algorithm.	K3
C03	Describe the various implementations of digital filter structures.	K2
C04	Analyze and design a Digital filter (FIR&IIR) from the given specifications.	K4
C05	Use the Multi-rate Processing concepts in various applications.	K2
C06	Describe the concepts of DSP Processor.	K3



**NAME OF THE COURSE: DIGITAL CONTROL SYSTEMS****COURSE CODE : V18EET38****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Understand the concepts of digital signal processing	<b>K2</b>
<b>C02</b>	Solve difference equations and determine pulse transfer functions	<b>K3</b>
<b>C03</b>	Analyze a discrete time system using state space model	<b>K3</b>
<b>C04</b>	Determine the stability of a discrete time system	<b>K4</b>
<b>C05</b>	Design a controller for discrete time system using conventional methods	<b>K4</b>
<b>C06</b>	Design a controller for discrete time system using state feedback	<b>K4</b>

**NAME OF THE COURSE: ELECTRICAL & HYBRID VEHICLES****COURSE CODE : V18EET39****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Differentiate between Electric vehicles and Hybrid Electric Vehicles	<b>K2</b>
<b>C02</b>	Discriminate between various Drive-Train Topologies	<b>K2</b>
<b>C03</b>	Identify different motors used for hybrid electric vehicles.	<b>K2</b>
<b>C04</b>	Explain the Sizing of Drive Train	<b>K2</b>
<b>C05</b>	Illustrate different batteries and other energy storage systems.	<b>K3</b>
<b>C06</b>	Discuss Various issues of energy management strategies	<b>K2</b>

**NAME OF THE COURSE: POWER SYSTEM REFORMS****COURSE CODE : V18EET40****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Understand fundamentals of power system deregulation and restructuring.	<b>K2</b>
<b>C02</b>	Compute Available Transfer Capability (ATC)	<b>K3</b>
<b>C03</b>	Apply methods to reduce congestion	<b>K3</b>
<b>C04</b>	Compute electricity pricing in deregulated environment	<b>K3</b>
<b>C05</b>	Understand the power system operation in deregulated environment	<b>K2</b>
<b>C06</b>	Understand importance of ancillary services	<b>K2</b>

**NAME OF THE COURSE: ENERGY STORAGE & BATTERY MANAGEMENT****COURSE CODE : V18EET41****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Understand need of energy storage systems	<b>K3</b>
<b>C02</b>	Determine various types of energy storage and various devices used for the purpose	<b>K3</b>
<b>C03</b>	Examine various real time applications	<b>K3</b>
<b>C04</b>	Interpret the role of battery management system	<b>K3</b>
<b>C05</b>	Illustrate the requirements of Battery Management System	<b>K3</b>
<b>C06</b>	Interpret the concept associated with battery charging / discharging process	<b>K3</b>

**NAME OF THE COURSE: SWITCHED MODE POWER CONVERTERS****COURSE CODE : V18EET42****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Compute the operation and control of non-isolated switch mode converters	<b>K3</b>
<b>C02</b>	Explain the operation and control of isolated switch mode converters	<b>K2</b>
<b>C03</b>	Describe the concepts of resonant converters	<b>K2</b>
<b>C04</b>	Compute control strategies of switching converters	<b>K3</b>
<b>C05</b>	Develop modeling of DC-DC converters	<b>K3</b>
<b>C06</b>	Illustrate controller design based on linearization	<b>K3</b>

**NAME OF THE COURSE: ELECTRICAL MACHINE DESIGN****COURSE CODE : V18EET43****Course Outcomes:****After successful completion of this course, the students will be able to**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
<b>C01</b>	Study mmf calculation and thermal rating of various types of electrical machines.	<b>K2</b>
<b>C02</b>	To design armature and field systems for D.C. machines.	<b>K3</b>
<b>C03</b>	To design core, yoke, windings and cooling systems of transformers.	<b>K3</b>
<b>C04</b>	To design stator and rotor of induction machines.	<b>K3</b>
<b>C05</b>	To design stator and rotor of synchronous machines and study their thermal behavior	<b>K3</b>
<b>C06</b>	The importance of computer aided design method.	<b>K3</b>