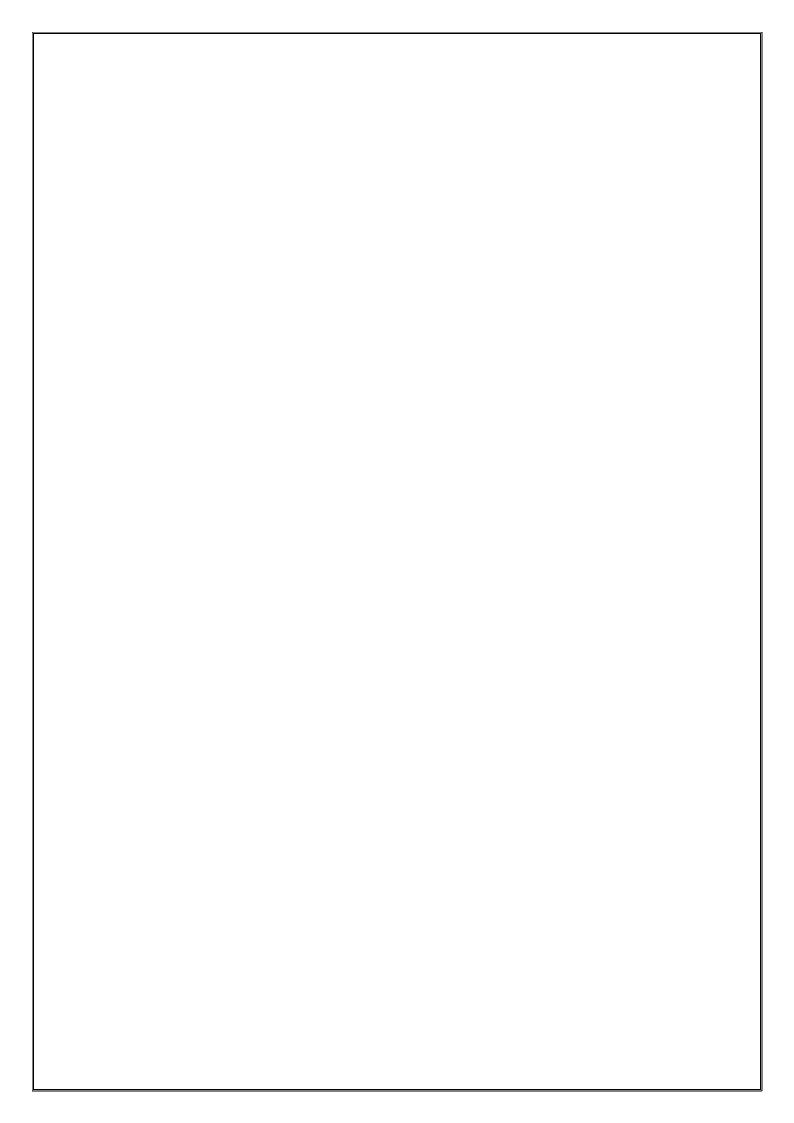


Department of Electrical and Electronics Engineering

Minutes of 5th Meeting of BoS (UG)

Venue	:	Seminar Hall,
		Department of EEE,
		Sri Manakula Vinayagar Engineering College
Date & Time		13 th September, 2022 at 10:00 A.M





SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE (An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University) (Accredited by NBA-AICTE, New Delhi, Accredited by NAAC with "A" Grade) Madagadipet, Puducherry - 605 107

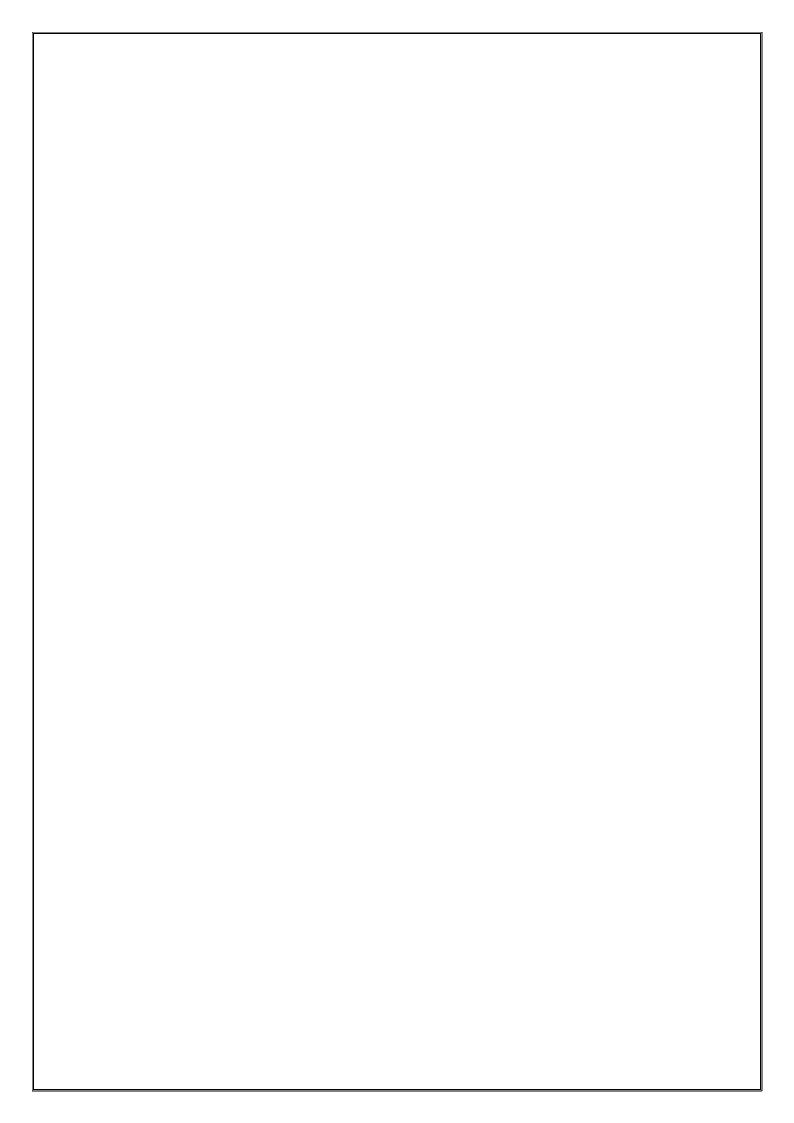


Department of Electrical and Electronics Engineering

Minutes of 5th Meeting of BoS

Table of Content

SI.No	Content				
1.	Minutes of 5 th Meeting of BoS (UG)				
	Annexure – I	Modified Syllabi after 5 th Meeting of BoS	10-39		
	Annexure – II	Academic Calendars	40-59		
	Annexure – III	On-line SWAYAM/MOOCS courses details	60-64		
	Annexure – IV	Panel of examiners	65-71		
2.	Minutes of 5 th	1-33			
	Annexure – I	Academic Calendars	7-13		
	Annexure – II	Panel of examiners	14-20		
	Annexure – III	On-line SWAYAM/MOOCS courses details	21		
	Annexure – IV	Ph.D Research scholar - Course work details and syllabi	22-30		
	Annexure – V	Ph.D Research scholar - Evaluation procedures for Course work	31-33		





DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Minutes of 5th Meeting of Board of Studies (UG)

The Fifth meeting of Board of Studies in Electrical and Electronics Engineering Department was held on **13th Sep 2022 at 10:00 A.M** in the Seminar Hall, Department of EEE, Sri Manakula Vinayagar Engineering College, with Head of Department in the Chair.

The following members were present for the BoS meeting

SI. No.	Name of the Member	Designation
Head of	the Department (Chairman)	
1	Dr. S. Anbumalar, M.E., Ph.D., Professor and Head Specialization: Control System Years of Experience: 29 years Sri Manakula Vinayagar Engineering College saravanan.anbumalar@gmail.com 9443179533	Chairman
The ent	ire faculty of each specialization	
2	Dr. P. Jamuna, M.E., Ph.D., Professor Specialization: Power Electronics and Drives Years of Experience: 16 Sri Manakula Vinayagar Engineering College jamuna1981@gmail.com 9789544379	Member
3	Dr. D. Raja, M.Tech., Ph.D., Professor Specialization: Electrical Drives and Control Years of Experience: 15 Sri Manakula Vinayagar Engineering College rajaapeee@gmail.com 9944337970	Member
4	Dr. K. Gowrishankkar, M.Tech., Ph.D., Professor Specialization: Instrumentation and control Years of Experience: 16 Sri Manakula Vinayagar Engineering College gowri200@yahoo.com 9095555412	Member
5	Dr. S. Ganesh Kumaran, M.E., Ph.D., Associate Professor Specialization: Electrical Machines Years of Experience:10 Sri Manakula Vinayagar Engineering College ganeshphd4u@gmail.com 9677624378	Member

	aculty Dr. T. Gayathri	
6	Professor, Dept. of Mathematics, SMVEC	Member
	Dr. K. Kathikeyan	
7	Associate Professor, Dept. of Chemistry, SMVEC	Member
	Mrs. G. Namita	
8	Associate Professor, Dept. of English, SMVEC	Member
	Dr. T. Jayavarthanan	
	Professor and Head	
9	Dept. of Physics, SMVEC,	Member
	Madagadipet-605107	
「wo si	ubject experts from outside the Parent University nominate	ed by the Academic Council
	Dr. J. Kanagaraj, M.E., Ph.D.,	· · · · · · · · · · · · · · · · · · ·
	Professor & Head (In charge)	
	Specialization: Control System	
	Years of Experience:22	
10	PSG College of Technology (Autonomous)	Subject Expert
	Coimbatore – 641 004.	
	Jkr.eee@psgtech.ac.in	
	94436 54496	
	Dr. P. Lakshmi, M.E., Ph.D.,	
	Professor	
	Specialization: Electrical Engineering	
11	Years of Experience:20	Subject Export
11	College of Engineering Guindy, Anna University,	Subject Expert
	Chennai. 600 025.	
	p_lakshmi@annauniv.edu	
	9444266117	
	opert nominated by the Vice-Chancellor from a panel of six	recommended by the
college	e principal.	
	Dr. A. Kavitha, M.Tech., Ph.D	
	Professor	
	Specialization: Electrical Engineering	
12	Years of Experience: 22	Subject Expert
	College of Engineering Guindy, Anna University,	
	Chennai-600025	
	akavitha@annauniv.edu,	
)no ro	9444388778	ating to placement
Jue re	presentative from industry/corporate sector/allied area rel	
	Er. S. Selva Kumar, B.Tech.	
13	Senior Engineer Qualcomm India Private Limited	Member
15	Bengaluru,	Member
	Karnataka - 560001	
)no ní	ostgraduate meritorious alumnus nominated by the Chairr	nan Board of Studios with
-	proval of the principal of the college	
	Er. K. Ramraj, M.Tech	
	Technical Director,	
11	Specialization: Power Electronics	
	Years of Experience:8	Member
14		
14	•	
14	LED FORSE India, Poornankuppam, Puducherry – 605 007.	

Agenda of the Meeting

Agenda 1/ BoS/ 5 /2022 /EEE /UG	Confirmation of minutes of 4 th meeting of BoS and the syllabi of B.Tech Electrical and Electronics Engineering of R-2020 Regulations – Modifications if any.
Agenda 2 / BoS/ 5 /2022 /EEE /UG	To discuss the modifications in the syllabi of III and IV year (V to VIII semesters), under Autonomous Regulations R-2020 for the B.Tech – Electrical and Electronics Engineering students admitted from the Academic Year 2020-21.
Agenda 3 / BoS/ 5 /2022 /EEE /UG	To discuss and approve the Academic Calendar for the ODD/EVEN Semester of Academic year 2022-23.
Agenda 4 / BoS/ 5 /2022 /EEE /UG	To discuss and approve the on-line SWAYAM/MOOCS courses for the IV year/ VIII semester students under R-2019 regulations during the period August 2022 to December 2022.
Agenda 5 / BoS/ 5 /2022 /EEE /UG	To approve the Professional and Open Elective courses offered to the III year/ V semester students under R-2020 regulations and IV year / VIII semester students under R-2019 regulations during the period November 2022 to March 2023
Agenda 6 / BoS/ 5 /2022 /EEE /UG	 To discuss the Research activities in the department Implementation of AICTE-MODROB during the period 2021-2023. Power Electronics and Drives Lab Sanctioned amount - Rs.11 Lakhs Project started on 06.10.2021 Patents Publications Journal Paper publications
Agenda 7 / BoS/ 5 /2022 /EEE /UG	To discuss and recommend the panel of examiners to the Academic Council

Agenda 8 / Any other additional points to be discussed with the permission of BoS/ 5 /2022 /EEE /UG Chair.

Minutes of the Meeting

Dr. S. Anbumalar, Chairman, BoS opened the meeting by welcoming the external members, the internal members and the meeting thereafter deliberated on agenda items that had been approved by the Chairman.

Agenda 1/ BoS /5 /2022 /EEE /UG

Confirmation of minutes of 4th meeting of BoS and the syllabi of B.Tech Electrical and Electronics Engineering of R-2020 Regulations – Modifications if any.

Chairman, BoS, apprised the minutes of 4th BoS, its implementation and then it is confirmed with the approval in 5th BoS meeting.

Agenda 2/ BoS /5 /2022 /EEE /UG

To discuss the modifications in the syllabi of III and IV year (V to VIII semesters), under Autonomous Regulations R-2020 for the B.Tech – Electrical and Electronics Engineering students admitted from the Academic Year 2020-21.

The modifications to be carried out in the syllabi of III and IV year, (V to VIII semesters) (R-2020 Regulations) are discussed and the following suggestions are given by BoS members.

S. No.	Regulations	Semester	Course Name with Code	Unit	Changes incorporated
1	R2020	V	Control Systems U20EET514	I	 The topic "transfer function" is shifted after the topic "Open loop and Closed loop"
2	R2020	V	Transmission and Distribution U20EET515	-	 Included the Text book "Electrical Power Systems", 6th edition, New Age International (P) Limited, New Delhi, 2018.
3	R2020	V	Power Electronics and Drives Lab U20EEP510	-	 Replaced the experiment "Microcontroller based control schemes for Stepper Motor" with "Multilevel inverter using PIC microcontroller"
4	R2020	×	Control Systems Lab U20EEP511	-	 The following three simulation experiments Simulation of RC lead / lag compensating network for the given specifications and to obtain its frequency response Simulation of open loop and closed loop control of DC buck converter Simulation of open loop and closed loop speed control of 3 phase induction motor Implementation of RC lead / lag compensating network for the given specifications and to obtain its frequency response Implementation of RC lead / lag compensating network for the given specifications and to obtain its frequency response Implementation of open loop and closed loop control of DC buck converter Implementation of open loop and closed loop control of DC buck converter
5	R2020	VI	Embedded System U20EET616	IV	The topic "Digital sensors" is removed due to repetition.
6	R2020	VI	Power System Analysis	V	The topic "Introduction to automatic voltage regulator

			U20EET618		systems" is included.
7	R2020	VI	Electrical Machine Design U20EET619	V	 The title of the unit "Design of synchronous machines and BLDC motors" is changed as "Design of synchronous machines"
8	R2020	VI	Embedded System Lab U20EEP612	-	 The experiment "Interfacing SPI Flash with interrupt" is replaced with "Interfacing of stepper motor"
9	R2020	VI	Power System Analysis Lab U20EEP614	-	 Replaced the experiment "Modeling and Analysis of Load frequency control" with "Analysis of power-flow problem using Fast Decoupled Load Flow method"
10	R2020	VII	Electric and Hybrid vehicle U20EET721		 The topic "Electric drives used in EV/HEV" is changed as "Electric drives and its Configuration used in EV/HEV"
11	R2020	VII	Industrial Automation and Control Lab U20EEP715		 Modifications are done in Industrial Automation and Control Lab course in order to focus more on Electrical related application experiments. The following two experiments Develop/ Execute ladder program for sequential control of DC motor Develop/ Execute ladder program for automated car parking system or elevator system PLC program for Sequential Motor Control PLC based automated car parking system or elevator system Removed the following seven experiments Multiple push button operation with delayed lamp for ON/OFF operation DOL Starter and Star Delta Starter operation by using PLC PLC based temperature sensing using RTD Develop/ Execute ladder program for the Control of automatic bottle filling system Parameter reading of PLC in SCADA Implementation of Distribution automation system using SCADA Included the following nine experiments

					 Implementation of Latching and Unlatching concepts in PLC DOL and Star Delta Starter operation for Three Phase Induction Motor using PLC PLC program for Forward and Reverse Control of Motors PLC based Stair case lighting control system PLC based Traffic Light Control system Design and development of solar tracking control system using PLC PLC program for speed control of DC motor IoT – based Street light monitoring and control IoT-based Industrial
12	R2020	V (Profession al Elective)	Utilization of Electrical Energy U20EEE506	I	 pollution monitoring system The topic "illumination calculation (for residential, industrial, commercial, health care, street lightings, sports, administrative complexes)" is replaced as "illumination calculation (residential, industrial, street, flood lighting)" The topics "Domestic appliances: Electric iron, Electric iron,
13	R2020	V (Profession al Elective)	Industrial Electrical System U20EEE510	-	 Electric toaster" are replaced as "Domestic appliances: Washing Machine, Water heater" Included the Reference book H.Joshi, "Residential Commercial and Industrial Systems", McGraw Hill Education 2009
14	R2020	VI (Profession al Elective)	Smart Grid U20EEE611	IV V	 Education, 2008. Removed the topic "Storage technologies" The topic "Renewable Energy Technologies" is replaced as "Introduction to Renewable Energy Technologies" The topic "Audit" is replaced as "Energy Audit"
15	R2020	VII (Profession al Elective)	Distributed Generation and Microgrids U20EEE716	-	 The reference book "Power Switching Converters: Medium and High Power" by Dorin Neacsu is replaced with Zobaa, Ahmed F., and Ramesh C.Bansal, "Handbook of renewable energy Technology", World Scientific, 2011.

The above corrections are incorporated and the Syllabi (Given in Annexure- I) are approved by the BoS members. Agenda 3/ BoS /5 /2022 /EEE /UG

To discuss and approve the Academic Calendar for the ODD/EVEN Semester of Academic year 2022-23.

The Academic Calendars are prepared for ODD/EVEN Semester of Academic year 2022-23 and it includes the schedule for CAT, Model Exam, QCM, Project review and Internal Marks distributions were discussed and approved **(given in Annexure-II)**

Agenda 4/ BoS /5 /2022 /EEE /UG

To discuss and approve the on-line SWAYAM/MOOCS courses for the IV year/ VIII semester students under R-2019 regulations during the period August 2022 to December 2022.

- The list of online SWAYAM / MOOCS courses chosen by IV year / VIII semester students under R-2019 regulations during the period August 2022 to December 2022 was presented and approved by the BoS members.
- The list of online SWAYAM / MOOCS courses chosen by the Faculty of EEE department during the period August 2022 to December 2022 was presented and approved by the BoS members. (given in Annexure- III)

Agenda 5/ BoS /5 /2022 /EEE /UG

To approve the Professional and Open Elective courses offered to the III year/ V semester students under R-2020 regulations and IV year / VIII semester students under R-2019 regulations during the period November 2022 to March 2023.

 The Professional Elective and Open Elective courses opted by III year / V semester students under R-2020 regulations and IV year / VIII semester students under R-2019 regulations during the period November 2022 to March 2023 is listed below are approved by the BoS members.

S. No.	Course Name	Course Code			
	Professional Elective – II				
1	Automotive Electronics for Electrical U20EEE509				
I	Engineering	02022209			
2	Utilization for Electrical Energy	U20EEE506			
	Open Elective – II				
1	Product Development and Design	U20HSO501			

Table 2: R-2019 regulations

S. No.	Course Name Course Code		
	Professional Elective - V		
1	Power System Economics	U19EEE80	
2	Soft Computing Techniques	U19EEE83	
	Professional Elective - VI		
1	1 Robotics and Control U19EEE89		
2	EHV AC and DC transmission	U19EEE86	

Agenda 6/ BoS /5 /2022 /EEE /UG

To discuss the Research activities in the department

- Implementation of AICTE-MODROB during the period 2021-2023.
 - Power Electronics and Drives Lab
 - Sanctioned amount Rs.11 Lakhs
 - Project started on 06.10.2021
- Patents Publication
 - Journal Paper publications

The efforts taken to improve the Research activities in the department were presented and the

BoS noted the Agenda.

- Received quotations from various vendors and submitted to the MODROB program evaluation committee for placing the purchase order.
- The Department has published 10 design patents and Planned to improve in the forthcoming years.
- Each Faculty in the department is advised to publish one SCI and one Scopus Journal for this semester.

Agenda 7/ BoS /5 /2022 /EEE /UG

To discuss and recommend the panel of examiners to the Academic Council.

• The list of Question Paper Setters and Evaluators (given in Annexure-IV) was presented and recommended by the BoS members to the academic council.

The Fifth meeting of BoS approval was concluded at 11.45 AM by **Dr. S. Anbumalar**, Chairman, Board of Studies, Department of Electrical and Electronics Engineering, Sri Manakula Vinayagar Engineering College.

SI.No	Name of the Member with Designation and official Address	MEMBERS AS PER UGC NORMS	Signature
1	Dr.S.Anbumalar Professor and Head Department of EEE SMVEC,Madagadipet-605107	Chairman	1982
2	Dr.A.Kavitha Professor, Department of EEE College of Engineering Guindy Anna University Chennai. 600 025.	Subject Expert (University Nominee)	Low the
3	Dr. P. Lakshmi Professor, Department of EEE College of Engineering Guindy Anna University Chennai. 600 025.	Subject Expert (Academic Council Nominee)	P. Jahl-
4	Dr. J. Kanakaraj Professor & Head Department of EEE PSG College of Technology (Autonomous) Coimbatore – 641 004.	Subject Expert (Academic Council Nominee)	J. Konort-j
5	Er.S. Selva Kumar Senior Engineer Qualcomm India Private Limited Bengaluru, Karnataka - 560001	Representative from Industry	S. S.L.
6	Er.K.Ramraj Technical Director LED FORSE India Poornankuppam Puducherry – 605 007.	Postgraduate Alumnus (nominated by the Principal)	E. Rom Roy

7	Dr. P. Jamuna Professor Department of EEE,SMVEC	Internal Member	Farmy .
8	Dr.D.Raja Professor Department of EEE,SMVEC, Madagadipet-605107	Internal Member	(alayar
9	Dr. K. Gowrishankar Professor Department of EEE,SMVEC , Madagadipet-605107	Internal Member	J.h.n_
10	Dr.S.Ganesh Kumaran Associate Professor Department of EEE, SMVEC, Madagadipet-605107	Internal Member	S. Somit
11	Dr.T.Gayathri Professor and Head Dept of Mathematics,SMVEC, Madagadipet-605107	Internal Member	T. G2
12	Dr.K.Kathikeyan Associate Professor Dept. of Chemistry, SMVEC, Madagadipet-605107	Internal Member	8- Step Bolming
13	Mrs.G.Namita Associate Professor Dept. of English, SMVEC Madagadipet-605107,	Internal Member	Nag
14	Dr. T. Jayavarthanan Professor and Head Dept. of Physics, SMVEC, Madagadipet-605107	Internal Member (Science & Humanity)	j.B.J-

Annexure – 1

U20EET514

CONTROL SYSTEMS

L T P C Hrs 2 2 0 3 60

Course Objectives

- To provide the use of transfer function models for analysis of physical systems.
- To provide adequate knowledge in the time response of systems and error analysis.
- To provide basic knowledge for obtaining the open loop and closed-loop frequency responses of systems.
- To get an exposure in the design of P/I/D controllers.
- To introduce about the state variable representation and stability analysis.

Course Outcomes

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

CO1- Develop the transfer function for the block diagram / signal flow graph model of electrical / mechanical / electro-mechanical systems. (K3)

CO2- Analyze the performance of control system using time-domain approach. (K4)

CO3- Analyze performance characteristics of system using Frequency response methods. (K3)

CO4- Design P/I/D controllers for the System in order to meet design specifications. (K4)

CO5 -Express the control systems into state space models and analyze the performance of the system. (K2)

UNIT I MODELING OF LINEAR TIME INVARIANT SYSTEMS

Control systems - Open loop and Closed loop – Transfer functions - Feedback control system characteristics - Mathematical modeling of Electrical, Mechanical and Electro-Mechanical systems - electrical analogues systems - Block diagrams reduction techniques - Signal flow graphs

UNIT II TIME DOMAIN ANALYSIS

Standard test signals – Transient analysis of first and second order systems using step input - Time responses – Time domain specifications – Error Analysis - Stability analysis - Concept of stability – Routh Hurwitz stability criterion - Root locus Techniques - Effect of adding poles and zeros.

UNIT III FREQUENCY DOMAIN ANALYSIS

Frequency response analysis – Correlation between frequency response and time-response analysis - frequency domain specifications - Bode plot - Polar plot - Nyquist stability criterion.

UNIT IV CONTROLLER DESIGN

Introduction to controllers - P-I-D controllers - Tuning methods - Ziegler-Nichol's Tuning - Performance criteria – Compensator design - Lead, Lag, Lead-Lag compensation using Bode Plot.

UNIT V STATE VARIABLE ANALYSIS

State Space Representation, Concept of state variables – State models for linear and time invariant Systems – Controllable, Observable, Jordan Canonical Forms - Solution of State Equation, State Transition Matrix – controllability and observability – Transfer function to State space model.

Text Books

- 1. I. J. Nagarath and M. Gopal, "Control Systems Engineering", New Age International Publishers, 6th Edition (Multi colour Edition), 2018.
- 2. Katsuhiko Ogata, "Modern Control Engineering", Pearson, 5th Edition, 2015.

Reference Books

- 1. Richard C. Dorf and Robert. H. Bishop, "Modern Control Systems", Pearson Education, 12th Edition, 2011.
- 2. John J. D'Azzo, Constantine H. Houpis and Sttuart N. Sheldon, "Linear Control System Analysis and Design with MATLAB", CRC Taylor and Francis Reprint, 6th Edition, 2014.
- 3. Benjamin C. Kuo, "Automatic Control Systems", PHI Learning Private Ltd, 9th Edition 2014.

Web References

- 1. https://www.tutorialspoint.com/control_systems/control_systems_useful_resources.html
- 2. http://www.controlsystemsacademy.com/
- 3. https://nptel.ac.in/courses/108/102/108102043/
- 4. https://www.isa.org/technical-topics/control-systems/
- 5. https://nptel.ac.in/courses/108/106/108106098/

Page | 10

(12 Hrs)

(12 Hrs)

(12 Hrs)

(12 Hrs)

(12 Hrs)

COs/POs/PSOs Mapping

COs					Prog	ram O	utcom	es (PO	s)					ram Spe omes (P	
	PO1	PO2	PO3	PO12	PSO1	PSO2	PSO3								
1	2	3	3	3	2	-	-	-	-	-	-	1	3	3	3
2	2	3	3	3	1	3	3	3							
3	2	3	3	3	2	-	-	-	-	-	-	1	3	3	3
4	2	3	3	3	2	-	-	-	-	-	-	1	3	3	3
5	2	3	3	3	2	-	-	-	-	-	-	1	3	3	3

TRANSMISSION AND DISTRIBUTION

Course Objectives

U20EET515

- To provide the structure of the electrical power system with various types of A.C/D.C Transmission and distribution systems
- To explain about the classification of transmission lines and their technical parameters.
- To understand the concept of transmission line models and its performance.
- To understand the necessity and importance of various insulators and cables used in power system.
- To have an overview of the modern electrification schemes and recent technologies in Transmission and Distribution systems

Course Outcomes

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

- **CO1** Summarize the structure of Generation, Transmission and Distribution with real time connection schemes. **(K2)**
- CO2 Calculate the line parameters in the transmission system and their effects in the overhead lines.(K3)
- CO3 Analyze on different types of transmission lines (short, medium, long) and its performance. (K2)
- CO4 Choose the adaptable types of insulators and cables for transmission and distribution systems. (K3)
- CO5 Compare various schemes of electrification and gain knowledge on High Voltage AC / DC systems (K2)

UNIT I DISTRIBUTION SYSTEMS

Structure of electric power systems - Single Line Diagram of Generation, Transmission and Distribution Systems - Comparison of distribution systems – Radial and Ring main – DC two wire, AC single phase and three phase systems – Selection of Feeders and Distributors– secondary distribution system - Kelvin's law and its limitations.

UNIT II LINE PARAMETERS AND EFFECTS ON TRANSMISSION SYSTEM

Resistance, inductance and capacitance of single and three phase transmission lines - symmetrical and unsymmetrical spacing – transposition - single and double circuits - stranded and bundled conductors - application of self and mutual GMD–Skin, Proximity and Corona effect - inductive and radio interference - Computation of line parameters.

UNIT III PERFORMANCE ANALYSIS ON TRANSMISSION SYSTEMS

Development of equivalent circuits for short, medium and long lines – Calculation of efficiency and voltage regulation – Tuned power lines - Power circle diagrams for sending and receiving ends - transmission capacity, steady state stability limit – voltage control of lines.

UNIT IV INSULATORS AND CABLES FOR DISTRIBUTION SYSTEMS

Insulators: types and comparison – voltage distribution in string insulator – string efficiency – Methods of improving string efficiency – Stress and sag calculations – effect of wind and ice – supports at different levels. Cables: types – capacitance of cables – insulation resistance - dielectric stress and grading - dielectric loss - thermal characteristics - capacitance of three core cables.

UNIT V RECENT TRENDS IN TRANSMISSION

Design of Rural distribution, planning and design of town electrification schemes – Need for power system interconnections systems – Components of a HVDC system - Types of DC links — Modern trends in DC Transmission systems – Comparison of HVDC and HVAC Transmission systems – Introduction to FACTS - FACTS controllers – Shunt and Series – Grounding methods in power stations.

Text Books

- 1. C.L.Wadhwa, Electrical Power Sytems, 6th edition, New Age International (P) Limited, New Delhi, 2018.
- 2. V. K. Metha and Rohit Metha, "Principles of Power System", S. Chand, 3rd Edition, 2005.
- 3. R. Padiyar, "HVDC Power Transmission Systems Technology and System Interactions", New Age International Publishers, 2012.
- 4. A. K. Theraja and B. L. Theraja, "Text Book of Electrical Technology: Volume 3: Transmission, Distribution and Utilization", S. Chand, 23rd Edition, 2004.

(9 Hrs)

(9 Hrs)

(9 Hrs)

(9 Hrs)

(9 Hrs)

L T P C Hrs 3 0 0 3 45

Reference Books

- 1. Hadi Saadat, 'Power System Analysis,' PSA Publishing; Third Edition, 2010.
- 2. J.Brian, Hardy and Colin R.Bayliss 'Transmission and Distribution in Electrical Engineering', Newnes, Fourth Edition, 2012.
- 3. Luces M.Fualken berry Walter Coffer, 'Electrical Power Distribution and Transmission', Pearson Education, 2007.

Web References

- 1. https://swayam.gov.in/nd1_noc20_ee39/preview
- 2. https://swayam.gov.in/nd1_noc20_ee86/preview
- 3. https://www.eei.org/ourissues/ElectricityTransmission/Documents/
- 4. https://www.osha.gov/SLTC/etools/electric_power/illustrated_glossary/index.html
- 5. http://solareis.anl.gov/documents/docs/APT_61117_EVS_TM_08_4.pdf

COs					Pro	gram O	utcome	es (POs	i)					gram Sp comes (F	
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	-	2	-	-	-	-	-	-	3	3	2	3
2	3	3	3	-	2	-	-	-	-	-	-	3	3	2	3
3	3	3	3	-	2	-	-	-	-	-	-	3	3	2	3
4	3	3	3	-	2	-	-	-	-	-	-	3	3	2	3
5	3	3	3	-	2	-	-	-	-	-	-	3	3	3	3

COs / POs and PSOs Mapping

LT P C Hrs POWER ELECTRONICS AND DRIVES LAB U20EEP510 0 2 30 1

Course Objectives

- To introduce the concepts involved in power semiconductor devices and its characteristics and to understand the basics of triggering circuits.
- To analyze the basic Power electronic circuit topologies including AC-DC, DC-DC, DC-AC and AC-AC converters.
- To enable the students to do simulation of Converter circuits and experimentally verify the results.
- To study and analyze the operation of the DC and AC drives.
- To introduce the industrial control of power electronic circuits as well as safe electrical connection and measurement practices.

Course Outcomes

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

CO1- Analyze the fundamental operations of power semiconductor devices and its characteristics. (K3)

- CO2- Demonstrate the operation of various power converters circuits. (K4)
- CO3- Illustrate the operating characteristics of AC and DC Drives. (K4)
- CO4 Acquire knowledge on design and implementation of Microcontroller based control schemes for electrical drives. (K5)
- CO5- Design and implement the closed loop controllers for converters. (K5)

List of Experiments

- 1. Characteristics of SCR and TRIAC,
- 2. Characteristics of MOSFET and IGBT.
- Single phase half and fully controlled converter
- 4. Three phase half and fully controlled converter.
- 5. Step Down chopper, Step up Chopper and Multi-guadrant chopper
- 6. Single phase AC voltage controller
- 7. Single phase step up and step down cycloconverter
- 8. Single phase and three phase IGBT based PWM inverter
- 9. Converter/ Chopper fed DC motor.
- 10. Speed control of Inverter fed Induction motor.
- 11. Multilevel inverter using PIC microcontroller
- 12. Study of microcontroller based BLDC Motor Drive.
- 13. Study of voltage regulation of DC buck converter

Reference Books

- 1. G. K. Dubey, "Fundamentals of Electrical Drives", Narosa Publishing House, 2nd Edition, 2010.
- 2. M. H. Rashid, "Power Electronics: Circuits, Devices and Applications", Pearson Education, PHI, New Delhi, 4th Edition, 2017
- 3. P. S. Bimbhra, "Power Electronics", Khanna Publishers, New Delhi, 6th Edition, 2018.
- 4. M. D. Singh and K. B. Khachandani, "Power Electronics", McGraw-Hill Education, 2nd Edition, 2017. 5. R .Krishnan, "Electric Motor Drives - Modeling, Analysis, and Control", Pearson Education India, 1st
- Edition, 2015.
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COs/POs/PSOs Mapping

COs					Prog	gram O	utcome	es (POs)				Pr Ou	ogram Speci tcomes (PS	ific Os)
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	2	2	3	1	-	-	2	2	-	1	3	2	3
2	3	3	2	2	3	1	-	-	2	2	-	1	3	2	3
3	3	3	2	2	3	1	-	-	2	2	-	1	3	2	3
4	3	3	2	2	3	1	-	-	2	2	-	1	3	2	3
5	3	3	2	2	3	1	-	-	2	2	-	1	3	2	3

U20EEP511

Course Objectives

- To provide the concepts of modeling and simulation of physical systems.
- To provide adequate knowledge in time response of systems and error analysis.
- To give basic knowledge in obtaining the open loop and closed–loop frequency responses of systems.
- To understand the concept of stability and its analysis.
- To get adequate knowledge about practical tuning of P/I/D controllers for motors/converters.

Course Outcomes

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

- CO1 Interpret different electrical and mechanical systems with its modeling. (K2)
- CO2 Use the time domain analysis, to predict stability of a system performance of the system. (K3)
- CO3 Demonstrate frequency domain analysis of a system. (K3)
- CO4 Familiarize with the tuning procedure of P/I/D controllers for converter/motor applications. (K4)

CO5 - Design a controller for any system to meet the desired performance. (K4)

List of Experiments

- 1. Mathematical modeling and simulation of physical systems
 - Mechanical
 - Electrical
- 2. Implementation of a RC lead/lag compensating network for the given specifications and to obtain its frequency response.
- 3. Determination of Transfer function of a separately excited DC Motor.
- 4. Implementation of open loop and closed loop control of DC buck converter
- 5. Design and implementation of PID controller for DC motor
- 6. Stability analysis of a system using Root Locus
- 7. Determination of transfer functions of a physical system using frequency response and Bode's asymptotes.
- 8. Position and speed control of DC servo motor
- 9. Design of Lead/Lag/Lead-Lag Compensator for DC Motor
- 10. Stability analysis using routh- hurwitz method
- 11. Time domain analysis of first order and second order system
- 12. Simulation of Controllability and Observability of a system
- 13. Implementation of open loop and closed loop speed control of 3 phase induction motor.

Reference Books

- 1. Hasan Saeed, "Automatic Control Systems (With MATLAB Programs)", S. K. Kataria & Son, 1st Edition, 2010.
- 2. I. J. Nagarath and M. Gopal, "Control Systems Engineering", New Age International Publishers, 6th Edition, 2018.
- 3. Katsuhiko Ogata, "Modern Control Engineering", Pearson, 5th Edition, 2015.
- 4. Benjamin C. Kuo, "Automatic Control Systems", PHI Learning Private Ltd, 9th Edition, 2014.

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- 2. https://www.quanser.com/solution/control-systems/
- 3. http://ncr.mae.ufl.edu/papers/te02.pdf
- 4. https://futureengineering.in/control-system-lab/
- 5. http://vlabs.iitb.ac.in/vlab/

COs/POs/PSOs Mapping

COs					Prog	ram O	utcom	es (PC)s)					ram Spo omes (P	
	PO1	PO2	PO3	PO12	PSO1	PSO2	PSO3								
1	3	3	3	3	3	1	-	-	3	2	-	1	2	2	3
2	3	3	3	1	2	2	3								
3	3	3	3	3	3	1	-	-	3	2	-	1	2	2	3
4	3	3	3	3	3	1	-	-	3	2	-	1	2	2	3
5	3	3	3	3	3	1	-	-	3	2	-	1	2	2	3

Page | 18

EMBEDDED SYSTEM

Course Objectives

U20EET616

- To gain knowledge about the fundamentals of embedded systems and its communication protocols.
- To understand the architectural features of ARM processor.
- To learn about the different programming techniques for ARM processor
- To impart knowledge on ARM processor peripherals with device driver and its interface circuits
- To provide a platform for the student to design, implement, integrate, and develop software and hardware applications with the real time system.

Course Outcomes

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

CO1 - Explain the basic building process of embedded system.(K2)

- CO2 Analyze any type of Microcontroller Architecture in detail.(K4)
- CO3 Apply the instruction sets to program ARM processor using Embedded C in KEIL software/ Micro C. (K3) CO4 - Provides the experience to integrate hardware and software for any microprocessor / microcontroller for product designing such as smart-phones, microcomputers etc. (K4)
- CO5 Impart the concepts of RTOS in accessing shared resources for optimized CPU performance, timing based operations, video streaming and audio streaming etc. (K3)

UNIT I OVERVIEW OF EMBEDDED SYSTEMS

Basics of Embedded Systems - I/O Devices: Types and Examples - Synchronous, ISO- Synchronous and Asynchronous Communication – Serial Communication devices and Protocols: I²C, SPI, UART - Parallel Device Ports.

UNIT II ARM ARCHITECTURE

ARM Programmer's model - Registers - Processor modes - Pipeline - Interrupts - ARM organization - ARM processor families – Instruction sets – Thumb Instruction Set: Register Usage, Other Branch Instructions, Data Processing Instructions – ARM Memory Management Unit.

UNIT III ARM PROCESSOR PROGRAMMING

Writing and optimizing the embedded C Code – Profiling and Cycle Counting – Instruction Scheduling -Register Allocation - Conditional Execution - Looping Constructs - Bit Manipulation -Timers and counters - Watchdog timer. Programming Tools: IDE and Programmer Interface.

UNIT IV ARM PROCESSOR PERIPHERALS

Clocking and Power Management - I/O handling - SPI and I²C - UART - Analog to Digital conversion temperature sensor - light sensor - accelerometer - Digital to Analog conversion

UNIT V RTOS FOR EMBEDDED SYSTEMS

Introduction to RTOS - Task and Task Scheduler - Scheduling policies - Interrupt Service Routines - Inter process communication mechanisms - Design issues- Introduction to Microcontroller/ Operating System.

Text books

- 1. Agus Kurniawan, "Getting Started With STM32 Nucleo Development", Agus Kurni, 1st Edition, 2016.
- 2. Sepehr Naimi, Sarmad Naimi, Muhammad Ali Mazidi, "The STM32F103 Arm Microcontroller and Embedded Systems-Using Assembly and C", Microdigitaled, 1st Edition, 2020.
- Brian Amos, "Hands-On RTOS with Microcontrollers: Building Real-time Embedded Systems Using 3. FreeRTOS, STM32 MCUs, and SEGGER Debug Tools", Thomas Learning, 1st Edition, 2020.
- 4. Geoffrey Brown, "Discovering the STM32 Microcontroller", Indiana University, Free Edition, 2016.

Reference books

- 1. Yifeng Zhu, "Embedded Systems with ARM Cortex-M Microcontrollers in Assembly Language", E-Man Press LLC, 2nd Edition, 2016.
- 2. Elicia White, "Making Embedded Systems", O' Reilly Series, 1st Edition, 2011.
- 3. Andrew N. Sloss, Dominic Symes, Chris Wright, "ARM Systems Developer's Guides Designing and Optimizing System Software", Elsevier, 2008.
- 4. Peckol, "Embedded system Design", John Wiley and Sons, 2nd Edition, 2010.
- 5. Frank Vahid, "Embedded System Design–A Unified Hardware and Software Introduction", John Wiley, 1st Edition, 2002.

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- 2. https://developer.arm.com/architectures/learn-the-architecture/introducing-the-arm-architecture/single-page
- 3. https://www.coursera.org/lecture/iot/lecture-1-1-what-are-embedded-systems-Gah7g
- 4. https://nptel.ac.in/courses/108102045/
- 5. https://www.eeweb.com/app-notes/tags/arm
- 6. https://en.wikibooks.org/wiki/Embedded_Systems/Real-Time_Operating_Systems

COs/POs/PSOs Mapping

COs					Prog	ram O	utcom	es (PC)s)					jram Spo omes (F	
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	3	3	3	2	-	-	-	-	-	2	3	3	3
2	3	2	3	3	2	3	3	3							
3	3	2	3	3	3	2	-	-	-	-	-	2	3	3	3
4	3	2	3	3	3	2	-	-	-	-	-	2	3	3	3
5	3	2	3	3	3	2	-	-	-	-	-	2	3	3	3

POWER SYSTEM ANALYSIS

Course Objectives

U20EET618

- To create computational models for power system using per unit analysis.
- To perform load flow analysis using Gauss Seidal and Newton-Raphson methods.
- To analyze the sequence network using symmetrical components.
- To import the knowledge about symmetrical and unsymmetrical faults in power system.
- To demonstrate different methods and factors influencing on power system stability

Course Outcomes

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

CO1 - Compute the reactance diagram and network matrices. (K4)

CO2 - Apply the iterative techniques to solve the power flow analysis used in power system planning. (K3)

- CO3 Analyze the Sequence networks using positive, negative and zero sequence network. (K4)
- CO4 Carry out short circuit studies to design the circuit breaker ratings in power system (K4)
- CO5 Analyze stability problems in power system during pre-fault and post-fault conditions (K4)

UNIT I MODELING OF POWER SYSTEM COMPONENTS

Need for system planning and operational studies - Power system components – Representation - Single line diagram - Per unit quantities - P.U. impedance / reactance diagram - Formulation of network matrices for the power systems - Bus impedance and bus admittance matrices - Reduction techniques on network matrices for network changes - Z bus Building algorithm.

UNIT II LOAD FLOW STUDIES

Classification of buses - formulation of load flow problem - Load flow solution by Gauss - Seidal, Newton - Raphson and Fast Decoupled Load Flow (FDLF) Analysis - Comparison - Computation of slack bus power, transmission loss and line flow - Voltage Control Methods - Tap-changing and phase - shifting transformers.

UNIT III SYMMETRICAL COMPONENTS AND SEQUENCE NETWORKS

Symmetrical components – Simple problems to calculate symmetrical voltages and currents - Sequence networks - positive, negative and zero sequence networks - Sequence networks of Series impedance, loads and Rotating machines – Advantages and Limitations.

UNIT IV FAULT ANALYSIS

Need for fault analysis - Types of faults - Symmetrical fault analysis through bus impedance matrix - Analysis of unsymmetrical faults- LG, LL and LLG - Analysis of simultaneous unbalanced short circuit and open conductor faults in power systems – short circuit capacity – circuit breaker selection - Representation of various types of faults in sequence networks.

UNIT V STABILITY STUDIES

Definition - Importance of stability analysis- classifications - Steady state and transient stability - Angle and voltage stability - Single Machine Infinite Bus (SMIB) system - swing equation – Swing Curve - Numerical integration methods - Equal area criterion - Critical clearing angle and time - Factors affecting stability - Methods of improving transient stability. Introduction to automatic voltage regulator systems.

Text Books

- 1. P. Kundur, "Power System Stability and Control", Tata McGraw Hill Education Pvt. Ltd., New Delhi, 10th Reprint, 2013.
- 2. D. P. Kothari and I. J. Nagrath, "Power System Engineering", Tata McGraw-Hill Education, 3rd Edition, 2019.
- 3. Hadi Saadat, "Power System Analysis", Tata McGraw Hill Education Pvt. Ltd., New Delhi, 21st Reprint, 2010.

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Reference Books

- 1. M. A. Pai, "Computer Techniques in Power System Analysis", Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2nd Edition, 2012.
- 2. J. Duncan Glover, Mulukutla S. Sarma, Thomas J. Overbye, "Power System Analysis and Design", Cengage Learning, 5th Edition, 2016.
- 3. John J. Grainger, Jr. William D. Stevenson, "Power System Analysis", McGraw Hill Education (India) Private Limited, New Delhi, 2nd Edition, 2015.

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- 2. https://nptel.ac.in/courses/108/107/108107127/
- 3. https://pserc.wisc.edu/webinars/systems_webinars.aspx
- 4. https://www.classcentral.com/course/swayam-power-system-analysis-14243

COs/POs/PSOs Mapping

COs					Prog	jram O	utcom	es(PO	s)					am Spec mes(PS	
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	2	2	3	1	-	-	-	-	-	1	3	2	2
2	3	2	2	2	3	1	-	-	-	-	-	1	3	2	2
3	3	3	2	2	3	1	-	-	-	-	-	1	3	2	2
4	3	3	2	2	3	1	-	-	-	-	-	1	3	2	2
5	3	3	2	2	3	1	-	-	-	-	-	1	3	2	2

Page | 22

U20EET619

Course Objectives

 To understand the design considerations, thermal rating, insulation requirements and magnetic circuit calculations of static and rotating electrical machines.

ELECTRICAL MACHINE DESIGN

- The course refreshes the construction details and design aspects of various parts of DC machines.
- To provide the knowledge on the design aspects of transformer with minimum cost. •
- The course refreshes the construction details and design aspects of various parts of induction motor. •
- To equip the students with construction details and design aspects of synchronous machines and BLDC motor.

Course Outcomes

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

- CO1 Design the machines with proper thermal rating and insulation requirements.(K3)
- **CO2** Analyze and evaluate the various design parameters of a DC machine for variable speed motor applications in industry.(K4)
- CO3 Analyze the various parameters of transformer and to design distribution and power transformers for real time applications. (K4)
- CO4- Analyze and formulate the suitable design for three phase induction motor. (K4)
- CO5- Apply the design concepts of Synchronous machines and BLDC motors. (K3)

UNIT I INTRODUCTION

Design Factors and Limitations – Modern Trends - Major considerations in Electrical Machine Design – Biot Savart law - soft magnetic materials, Electrical steel sheets, Classification of insulating materials - Design of Magnetic circuits - Magnetizing current - Flux leakage - real and apparent flux densities -, heating and cooling curves - rating of electric machines- calculation of effective magnetic flux in a motor- Magnetic circuit and reluctance calculation with two different materials.

UNIT II DESIGN OF DC MACHINES

Construction - Output Equation - Main Dimensions - Choice of specific loadings -Selection of number of poles -Dimensions of yoke, main pole and air gap - Estimation of ampere turns for the magnetic circuits - Design of lap winding and wave winding - Design of Armature - Design of Commutator and brushes - Design of shunt and series field system - reduction of eddy current in conductors in rotating machine.

UNIT III DESIGN OF TRANSFORMERS

Construction – Output Equation (1- ϕ and 3- ϕ) – Expression for volts/ turn, estimation of no. of turns – choice of specific loadings - Overall dimensions -design of yoke, core and winding for core and shell type transformers -Estimation of No load current and Voltage regulation- Temperature rise in Transformers - Design of Tank and cooling tubes of Transformers – Expression for the leakage reactance of core type transformer with concentric coils.

UNIT IV DESIGN OF THREE PHASE INDUCTION MOTORS

Construction - Output equation- Main dimensions - choice of specific loadings - Design of squirrel cage rotor and wound rotor - Design of stator slots and Winding, Choice of Length Air Gap, Estimation of Number of Slots for Squirrel Cage Rotor. Design of Rotor Bars and end Ring. Magnetic leakage calculations - Operating characteristics: Magnetizing current - Short circuit current.

UNIT V DESIGN OF SYNCHRONOUS MACHINES

Construction - Output equations - choice of specific loadings - Design of salient pole machines - Short circuit ratio -Armature design – Estimation of air gap length – Design of salient and non-salient pole rotors – Design of damper winding - Determination of full load field MMF - Design of field winding - Design of turbo alternators. Computer Aided Design: Design of DC machines, Design of single phase Transformer

Text Books

- 1. A. K. Sawhney "A Course in Electrical Machine Design", Dhanpat Rai & Sons, New Delhi, 6th Edition, 2016.
- 2. M. V. Deshpande, "Design and Testing of Electrical Machines", PHI learning Pvt. Ltd, 3rd Edition, 2010.
- 3. S. K. Sen. "Principles of Electrical Machine Designs with Computer Programmes", Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 2nd Edition, 2009.

Reference Books

- A. Shanmugasundaram, G. Gangadharan, R. Palani, "Electrical Machine Design Data Book", New Age 1. International Pvt. Ltd., 1st Edition, 2011.
- 2. A.Nagoor kani, "A Simplified text in Electrical Machine Design", RBA publications, Second Edition, 2013.

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- Thomas A. Lipo, "Introduction to AC Machine Design", John wiley & sons inc., 1st Edition, 2017.
 K. M. Vishnumurthy, "Computer aided design of electrical machines", B S Publications, 1st Edition, 2015.

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- 2. https://nptel.ac.in/courses/108/106/108106023.
- 3. https://www.windings.com/technical-reference/basic-motor-design-tutorial.
- 4. https://ndl.iitkgp.ac.in/homestudy/engineering.
- 5. http://electrical-engineering-portal.com/

COs/POs/PSOs Mapping

COs					Progr	am O	utcom	es (Po	Os)					ram Spo omes (F	
COS	P01	PO2	PO3	PO12	PSO1	PSO2	PSO3								
1	2	3	2	2	2	1	1	-	-	-	-	1	3	2	2
2	3	2	2	1	3	2	3								
3	3	3	2	3	2	1	1	-	-	-	-	1	3	3	3
4	3	3	3	3	2	1	1	-	-	-	-	1	3	2	3
5	3	3	3	2	2	1	1	-	-	-	-	1	2	3	3

U20EEP612

EMBEDDED SYSTEM LAB

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Course Objectives

- To study and Identify hardware and software components to build an embedded system.
- To demonstrate the interfacing of peripherals with ARM7 Processor.
- To understand the key concepts of embedded systems such as I/O, timers, interrupts and interaction with peripheral devices.
- To gain knowledge and design of microcontroller based embedded system.
- To create a real-time system for particular applications.

Course Outcomes

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

- **CO1** Explain the working of ARM Processor, FPGA and raspberry pi.(K3)
- CO2 Interface ARM7 Processor, FPGA and raspberry pi Microcontrollers with external Peripheral devices.(K4)
- **CO3** Handle interrupts for real time control applications using ARM Processor.(K4)
- CO4 Generate PWM signals for motor control applications. (K4)
- CO5 Design and develop interface between controller and device.(K4)

LIST OF EXPERIMENTS

1. Study on ARM Cortex M series Controller starter kit

Conduction of following experiments using ARM Cortex M series Controller

- 2. Interfacing ADC and DAC
- 3. Interfacing real time clock
- 4. Interfacing Keyboard and LCD
- 5. Interfacing of stepper motor
- 6. Interfacing of PWM based LED lighting board
- 7. Interfacing DC motor
- 8. Interfacing temperature sensor
- 9. Interfacing with PC via UART interface
- 10. Interfacing EEPROM via I2C
- 11. Study on FPGA developer board for PWM generation
- 12. Study on Raspberry pi for IoT application
- 13. Study on Real Time Operating Systems

Reference Books

- 1. Agus Kurniawan, "Getting Started With STM32 Nucleo Development", Agus Kurni, 1st Edition, 2016.
- 2. Sepehr Naimi, Sarmad Naimi, Muhammad Ali Mazidi, "The STM32F103 Arm Microcontroller and Embedded Systems-Using Assembly and C", Microdigitaled, 1st Edition, 2020.
- 3. Brian Amos, "Hands-On RTOS with Microcontrollers: Building Real-time Embedded Systems Using FreeRTOS, STM32 MCUs, and SEGGER Debug Tools", Thomas Learning, 1st Edition, 2020.
- 4. Geoffrey Brown, "Discovering the STM32 Microcontroller", Indiana University, Free Edition, 2016.
- 5. Raj Kamal, "Embedded Systems-Architecture, Programming and Design", Tata McGraw Hill, 3rd Edition, 2017.
- 6. Lyla B. Das, "Embedded Systems-an integrated approach", Pearson Education, 1st Edition, 2013.
- 7. K.V. Shibu, "Introduction to Embedded Systems", Tata McGraw Hill, 2nd Edition, 2016.
- 8. Michael J. Pont, "Embedded C", Addison Wesley, 1st Edition, 2002.
- 9. David E. Simon, "An Embedded Software Primer", Pearson Education, 1st Edition, 2012.

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- 2. https://nptel.ac.in/courses/106/105/106105193/
- 3. https://nptel.ac.in/courses/108/105/108105057/
- 4. https://nptel.ac.in/courses/117/106/117106112/
- 5. https://nptel.ac.in/courses/106/103/106103182/
- 6. https://developer.arm.com/architectures/learn-the-architecture/introducing-the-arm-architecture/single-page
- 7. https://www.eeweb.com/app-notes/tags/arm
- 8. https://www.tutorialspoint.com/embedded_systems/es_overview.htm

COs/POs/PSOs Mapping

COs					Pro	gram O	utcome	es (POs)					ogram Speci tcomes (PS	
	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	2	2	3	2	-	-	2	2	-	2	3	2	3
2	3	3	2	2	3	2	-	-	2	2	-	2	3	2	3
3	3	3	2	2	3	2	-	-	2	2	-	2	3	2	3
4	3	3	2	2	3	2	-	-	2	2	-	2	3	2	3
5	3	3	2	2	3	2	-	-	2	2	-	2	3	2	3

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Course Objectives

- To analyze the electrical power system using per unit analysis.
- To apply iterative techniques for power flow analysis of power system.
- To carry out short circuit studies and Economic load dispatch on power system.
- To analyze Load curve and Load duration curve.
- To model and analyze the voltage and frequency control loops in power system.

Course Outcomes

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

- **CO1-** Calculate the reactance values of power system components
- **CO2-** Formulate Bus Admittance and Impedance matrices, used in power flow analysis.
- **CO3-** Analyze the voltage and power flow condition of power system using Gauss Seidal and Newton Raphson methods.
- **CO4** Analyze Symmetrical and Unsymmetrical faults in power system used to design relays and circuit breakers.
- **CO5** -Develop the load and load duration curves for calculating average load, unit generated load factor, etc.

List of Experiments

- 1. Computation of power system components in per units.
- 2. Modeling and Computation of Transmission Line Parameters
- 3. Formulation of a bus impedance matrix and admittance Matrix
- 4. Symmetrical components for different case studies
- 5. Short circuit studies of Power System.
- 6. Analysis of power-flow problem using Gauss-Seidel method.
- 7. Analysis of power-flow problem using Newton Raphson method.
- 8. Analysis of power-flow problem using Fast Decoupled Load Flow method.
- 9. Analysis of Economic load dispatch in power system.
- 10. Load curve and load duration curve
- 11. Numerical Integration of Swing equation
- 12. Modeling and Analysis of Automatic Voltage Regulator system
- 13. Stability analysis of SMIB System

Reference Books

- 1. Hadi Saadat, "Power System Analysis", Tata McGraw Hill Education Pvt. Ltd., New Delhi, 21st Reprint, 2010.
- M. A. Pai, "Computer Techniques in Power System Analysis", Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2ndEdition, 2012.
- P. Kundur, "Power System Stability and Control", Tata McGraw Hill Education Pvt.Ltd., New Delhi, 10th Reprint, 2010

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- 1. https://nptel.ac.in/courses/108/105/108105067/
- 2. https://nptel.ac.in/courses/108/107/108107127/

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)	Program Specific
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													Outo	comes (P	SOs)
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	3	2	2	1	1	-	-	3	2	1	2	3	2	2
2	1	3	2	2	1	1	-	-	3	2	1	2	3	2	2
3	1	3	2	2	1	1	-	-	3	2	1	2	3	2	2
4	1	3	2	2	1	1	-	-	3	2	1	2	3	2	2
5	1	3	2	2	1	1	-	-	3	2	1	2	3	2	2

Page | 28

ELECTRIC AND HYBRID VEHICLE

Course Objectives

U20EET721

- To familiarize with the fundamental concept of electric vehicle
- To overview the energy storage technologies used for electric and hybrid vehicle.
- To determine various electric drives suitable for electric vehicles.
- To understand about the different power converter topologies used in electric vehicle
- To understand the concept of hybrid and electric vehicle architecture, component sizing and electric motor drive.

Course Outcomes

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

- CO1 Summarize the basics of electric vehicle and its working principle. (K2)
- CO2 Combine the different energy storage technologies and its implementation in hybrid vehicle. (K4)
- CO3 Develop the hybrid electric vehicle with different power converter topology. (K2)
- CO4 Review the working of different configurations of electric vehicle and its concepts (K2)
- CO5 Describe the working of different configurations of hybrid vehicles. (K2)

UNIT I INTRODUCTION TO EV

History of hybrid and electric vehicles - social and environmental importance - impact of modern drive - trains on energy supplies - Fundamentals of vehicle propulsion and Braking: Dynamic Equation - Power train tractive effort - Vehicle Power Plant and Transmission Characteristics - Vehicle Performance.

UNIT II HYBRID VEHICLE

Classification - Series and Parallel HEVs - Series-Parallel Combination - Advantages and disadvantages Internal Combustion Engines: Reciprocating Engines - Gas Turbine Engine- Design of an HEV: Hybrid Drive train - Sizing of Components.

UNIT III ELECTRIC PROPULSION DRIVE SYSTEMS

Electric drives and its Configuration used in EV/HEV: Induction motor drives - DC motor drives - Permanent magnet motor drives - SRM Drives.

UNIT IV ELECTRIC VEHICLE

Configurations of EV - advantages - EV transmission configuration: Transmission components - gear ratio - EV motor sizing - EV market.

UNIT V ELECTRIC VEHICLE STORAGE TECHNOLOGY

Battery Types - Parameters - Technical characteristics - modelling and equivalent circuit - Methods of battery charging - Fuel cells: Types - Fuel cell electric vehicle - Ultra capacitors - Hydrogen storage systems -Flywheel technology.

Text Books

- 1. Mehrdad Ehsani, Yimin Gao, Sebastien E.Gay, Ali Emadi, "Modern Electric, Hybrid Electric and Fuel Cell Vehicles", CRC Press, 3rd Edition, 2019.
- Igbal Hussain, "Electric and Hybrid Vehicles Design Fundamentals", CRC Press, 2nd Edition, 2011. 2.

Reference Books

- 1. K. T. Chau, "Electric vehicle machines and drives: Design, analysis and application", John Willey and Sons Singapore pte. ltd., 1st Edition, 2015.
- 2. J. Larminie and J. Lowry, "Electric vehicle technology explained", John Willey & Son Itd., 2nd Edition, 2012.

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- 1. https://nptel.ac.in/courses/108103009/
- 2. https://www.evgo.com/why-evs/types-of-electric-vehicles/
- 3. https://www.electrichybridvehicletechnology.com/
- 4. http://www.ieahev.org/
- 5. https://www.sae.org/learn/content/acad06/
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COs/POs/PSOs Mapping

(9 Hrs)

(9 Hrs)

(9 Hrs)

(9 Hrs)

(9 Hrs)

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COs	Program Outcomes (POs)													Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	3	2	2	-	-	3	-	-	-	-	1	2	3	2	
2	2	3	3	3	-	-	3	-	-	-	-	1	2	3	2	
3	3	3	2	2	-	-	3	-	-	-	-	1	2	3	2	
4	3	3	3	2	-	-	3	-	-	-	-	1	2	3	2	
5	2	3	3	2	-	-	3	-	-	-	-	1	2	3	2	

INDUSTRIAL AUTOMATION AND CONTROL LAB

U20EEP715

Course Objectives

- To gain practical knowledge regarding the automation components.
- To perform delay operations using the PLC.
- To gain practical knowledge on interfacing of different sensors, counter, timer, RTD using PLC.
- To equip the students to provide the solution for real time industrial applications.
- To equip the students to develop a fault monitoring system using SCADA.

Course Outcomes

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

CO1 -Analyze the ladder logic programs and components used for process control.(K2)

CO2-Design PLC-relay logic for the real time applications (K3)

CO3- Implement Industrial processing system. (K3)

CO4-Design a SCADA monitoring system for real time applications.(K3)

CO5-Diagnose the fault in Power generation and distribution networks, etc. (K3)

List of Experiments

Programmable Logic Controller

- 1. Implementation of Latching and Unlatching concepts in PLC
- 2. Interfacing of lamp and button with PLC for ON/OFF operation.
- 3. Perform Delayed Operation of Lamp using Push Button.
- 4. Combination of Counter and Timer for Lamp ON/OFF operation.
- 5. PLC program for Sequential Motor Control.
- 6. PLC based automated car parking system or elevator system.
- 7. DOL and Star Delta Starter operation for Three Phase Induction Motor using PLC.
- 8. PLC program for Forward and Reverse Control of Motors
- 9. PLC based Stair case lighting control system
- 10. PLC based Traffic Light Control system
- 11. Design and development of solar tracking control system using PLC
- 12. PLC program for speed control of DC motor.

SCADA

- 1. PLC interface with SCADA and status read / Command Transfer operation
- 2. Alarm annunciation using SCADA
- 3. Experiments on Transmission Module
 - a. Local Mode
 - b. Simulation of Faults

Internet of Things IoT:

- 1. IoT based Street light monitoring and control
- 2. IoT-based Industrial pollution monitoring system.

Reference Books

- 1. S. Mukhopadhyay, S. Sen and A. K. Deb, "Industrial Instrumentation, Control and Automation", Jaico Publishing House, 1st Edition, 2013.
- 2. Gary Dunning, "Introduction to Programmable Logic Controllers", Cengage Learning, 3rd India Edition, 2007.
- 3. Frank lamb, "Industrial Automation: Hands On", McGraw-Hill Education, 1st Edition, 2013.
- 4. T. Huges, "Programmable Logic Controllers", ISA press, 1994.
- 5. R. Krishnan, "Electric Motor Drives, Modelling, Analysis and Control", Pearson Education India, 1st Edition, 2015.
- 6. Viswanandham, "Performance Modeling of Automated Manufacturing Systems", PHI, 1st Edition, 2009.
- Jose A. Romagnoli, Ahmet Palazoglu, "Introduction to Process control", CRC Taylor and Francis group, 3rd Edition, 2020.

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- 1. https://electrical-engineering-portal.com/download-center/books-and-guides/automation-control/plcladder-sequential-programming
- 2. https://www.beckhoff.com/english.asp?start/?pk_campaign=AdWords-AdWordsSearch-IndustrialAutomationEN&pk_kwd=industrial%20automation
- 3. https://www.advantech.com/solutions/ifactory
- 4. https://www.plantautomation-technology.com/articles/an-overview-of-distributed-control-systems-dcs
- 5. https://www.controleng.com/articles/scada-remains-relevant-for-industrial-automation/
- 6. https://sw.aveva.com/monitor-and-control/scada

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)													Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	3	3	2	3	-	-	-	3	2	-	1	3	3	3	
2	3	3	3	2	3	-	-	-	3	2	-	1	3	3	3	
3	3	3	3	2	3	-	-	-	3	2	-	1	3	3	3	
4	3	3	3	2	3	-	-	-	3	2	-	1	3	3	3	
5	3	3	3	2	3	-	-	-	3	2	-	1	3	3	3	

UTILIZATION OF ELECTRICAL ENERGY

Course Objectives

U20EEE506

- To design optimized illumination system for domestic and industrial applications.
- To acquire knowledge about the different types of heating and welding.
- To make awareness in the usage of refrigeration and air conditioning system.
- To familiarize with the construction and working of traction systems.
- To impart the knowledge on electroplating techniques and operations of batteries.

Course Outcomes

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

CO1 -Develop a clear idea on lighting requirement for domestic and industrial needs in an efficient way. (K3)

CO2 - Analysis the different types of heating and welding schemes used in the industries (K4)

CO3 -Repair the minor faults that occurs in refrigerator and in air conditioning system(K4)

CO4 -Analyze the speed-time characteristics and performance of the electric traction. (K4)

CO5 -Calculate the power requirement and efficiency of domestic appliances. (K4)

UNIT I ILLUMINATION

Introduction - basic terminologies - laws of illumination - polar curves - Rousseau's construction - electrical lamps – Basic principles of light control – Types – Design of lighting – illumination calculation (residential, industrial, street, flood lighting) - bureau of energy efficiency star rating for lamps.

UNIT II ELECTRIC HEATING AND WELDING

Role of electric heating for industrial applications – Types of Heating – Resistance – Induction - Arc furnace – Dielectric - solar - heating of building, domestic water heater, Electric oven. Welding methods - Resistance -Arc - Laser – Ultrasonic - Power supply equipment's for welding.

UNIT III REFRIGERATION AND AIR CONDITIONING

Electrical Circuit of Refrigerator - Trouble shooting of Refrigerator - Air conditioning types and their applications - smart air conditioning systems - Trouble shooting of air conditioning.

UNIT IV ELECTRIC TRACTION

Traction system - Power supply - Traction drives - braking - Tractive effort calculations - speed-time characteristics. Locomotives and train - Tram ways and Trolley bus - Recent trends - Metro and Mono rail systems.

UNIT V ELECTROLYSIS AND DOMESTIC APPLIANCES(9 Hrs)

Electrolysis- Laws of Electrolysis, power supply, Efficiency – Electro Plating. Batteries-Types – Components, rating of batteries - Methods of charging and maintenance. Domestic appliances: Washing Machine, Water heater - Introduction to Green Building Concept and energy auditing.

Text Books

- 1. J. B. Gupta, "Utilization of Electrical Power and Traction", Kataria Publications, Reprint Edition, 2020
- R. K. Raiput, "Utilization of Electrical Power". Lakshmi publications, 2nd Edition, 2016. 2.
- E. Openhshaw Taylor and V. V. L. Rao, "Utilization of Electric Energy", Orient Longman, New Delhi, 2nd 3. Edition, 2007.

Reference Books

- 1. S. K. Sahdev, "Utilization of electrical energy and electric traction", New Age International Publisher, 1st Edition, 2016.
- 2. H. Partap, "Art and Science of Utilization of Electrical Energy", Dhanpat Rai and Sons, Delhi, 2nd Edition, 2015.
- 3. C. L. Wadhwa, "Generation, Distribution and Utilization of Electrical Energy", New Age International Publishers, 4th Edition, 2017.
- 4. Pradip Kumar Sadhu, Soumya Das, "Modern utilization of Electric Power" CBS Publisher, 1st Edition, 2018.

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- 2. https://nptel.ac.in/courses/112/107/112107090/
- 3. https://nptel.ac.in/courses/112/105/112105129/
- 4. https://nptel.ac.in/courses/103/108/103108162/
- 5. https://beeindia.gov.in/

COs/POs/PSOs Mapping

COs					Prog	gram O	utcome	es (POs	6)					jram Spe omes (P	
	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	-	-	-	-	-	-	-	-	-	3	2	2
2	3	2	2	-	-	-	-	-	-	-	-	-	3	2	2
3	3	2	2	-	-	-	-	-	-	-	-	-	3	2	2
4	3	2	2	-	-	-	-	-	-	-	-	-	3	2	2
5	3	2	2	-	-	-	-	-	-	-	-	-	3	2	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

INDUSTRIAL ELECTRICAL SYSTEM

Course Objectives

U20EEE510

- To import basic ideas on electrical control components and electrical safety practices
- To provide the electrical wiring for residential and commercial buildings.
- To study on various illumination systems for commercial applications.
- To explain about the various components used for installation purpose.
- To import knowledge on modern techniques used for the monitoring and control.

Course Outcomes

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

- CO1 -Acquire knowledge on electrical components used in industries. (K2)
- CO2 Design residential and commercial wiring connection. (K4)
- CO3 Design the different illumination systems for industries. (K3)

CO4 - Acquire knowledge on selection of installation components for industries. (K3)

CO5 - Apply the PLC and SCADA system for the automation of industries. (K3)

UNIT I ELECTRICALCONTROL COMPONENTS

LT system wiring components - selection of cables - wires - switches - distribution box - metering system -Tariff structure - protection components - Fuse - MCB - MCCB - ELCB - inverse current characteristics symbols - single line diagram (SLD) of a wiring system - Contactor - Isolator - Relays - MPCB - Electric shock and Electrical safety practices.

UNIT II WIRING SYSTEMS

Types of residential and commercial wiring - general rules and guidelines for installation - load calculation and sizing of wire - rating of main switch - distribution board and protection devices - earthing systems requirements of commercial installation - lighting schemes - selection - sizing of components.

UNIT III ILLUMINATION SYSTEMS

Light - lumen - intensity - candle power - lamp efficiency - specific consumption - glare - space to height ratiowaste light factor - depreciation factor - various illumination schemes - Incandescent lamps and modern luminaries like CFL - LED and their operation - energy saving in illumination systems - design of a lighting scheme - flood lighting.

UNIT IV INDUSTRIAL INSTALLATION COMPONENTS

HT connection - industrial substation - Transformer selection - Industrial loads - motors - Cable and Switchgear selection - Lightning Protection - Earthing design - Power factor correction - kVAR calculations type of compensation - Introduction to PCC- MCC panels. Specifications of LT Breakers - MCB and other LT panel components. DG (Diesel Generator) Systems - Electrical Systems for the elevator - Battery banks -Sizing the DG - UPS System - Online and OFF line UPS - Battery Banks- Selection of UPS and Battery Banks.

UNIT V INDUSTRIAL AUTOMATION

Study of basic PLC - Role of automation-advantages of process automation - PLC based control system design - Panel Metering - Introduction to distributed control system (DCS) and SCADA system for distribution automation.

Text Books

- H. Partab , "Art and Science of Utilization of Electrical Energy", 2nd Edition, Dhanpat Rai and Co., 2017
 B. P. Patil, M. A. Chaudhari, "Industrial Electrical Systems I", 2nd Edition, Nirali Prakashan publications, 2015
- 3. R. K. Raiput, "Utilization of Electrical Power". Laxmi Publications., 2nd Edition, 2016.

References Books

- 1. Frank Lamb, "Industrial Automation: Hands On", McGraw-Hill Professional, 1st Edition, 2013.
- 2. C. L. Wadhwa, "Generation, Distribution and Utilization of Electrical Energy", New Age International, 4th Edition. 2017.
- 3. H.Joshi, "Residential Commercial and Industrial Systems", McGraw Hill Education, 2008.

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- 1. https://nptel.ac.in/courses/108/105/108105091/
- 2. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-061-introduction-to-electric-power-systems-spring-2011/
- 3. https://nptel.ac.in/courses/108/108/108108077/
- 4. https://nptel.ac.in/courses/108/105/108105088/
- 5. https://nptel.ac.in/courses/108/105/108105062/

COs/POs/PSOs Mapping

		Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
COs	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	2	1	-	-	2	-	-	-	-	-	2	1	2	3	
2	2	2	1	-	-	2	-	-	-	-	-	1	1	1	1	
3	2	2	1	-	-	2	-	-	-	-	-	1	1	1	3	
4	2	2	1	-	-	2	-	-	-	-	-	1	2	2	2	
5	2	2	2	-		2	-	-	-	-	-	2	2	2	2	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Page | 36

SMART GRID

Course Objectives

U20EEE611

- To familiarize with the fundamentals of smart grids technologies.
- To get exposure on Communication infrastructure and protocols.
- To study about the Wide Area Measurement Systems, Energy storage technologies for smart grid.
- To know about the various stability assessment tools in smart grid.
- To familiarize with the Power Quality issues of Grid connected Renewable Energy Sources.

Course Outcomes

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

CO1 -Compare the conventional electrical grid concepts with smart grid.(K1)

- CO2 Outline about the protocols and networks used in Smart grid.(K2)
- CO3 Explain the importance of WAM and energy storage technologies used in smart grid.(K2)
- CO4 -Acquire knowledge on distributed generation and micro grids in smart grid.(K3)

CO5 - Analyze the power quality issues in smart grid. (K3).

UNIT I INTRODUCTION

Overview of Electrical Grid – Smart Grid - Characteristics - Inventory Technologies - Operating Principles - Models of Components, Implementation - Early initiatives - Overview of technologies - Key Challenges - Self-Healing Grid - Opportunities and Barriers - Recent Research technology.

UNIT II SMART METERING AND COMMUNICATION

Smart meters - Communications infrastructure, protocols and hardware - Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) drivers - benefits – Power line communication (PLC) - Machine tomachine communication models - Home Area Networks (HAN), Wide Area Networks (WAN) and Neighborhood Area Networks (NAN) - Wired and Wireless communication technologies – Cryptosystem - Internet of things (IOT).

UNIT III WAMS AND ENERGY STORAGE TECHNOLOGIES(9 Hrs)

Synchro-Phasor Measurement Units (PMUs) – Wide Area Measurement Systems (WAMS) - Geographic Information system (GIS) and Google Mapping Tools, Multiagent Systems (MAS) Technology - Sensor Networks, Fault Detection - Phasor Data Concentrator (PDC) – Road Map for synchro-phasor technology – Operational experience and Blackout analysis using PMU. Batteries, Fuel cell, Flywheels, SMES systems and Super capacitors.

UNIT IV INTEGRATION, CONTROL AND OPERATION OF DISTRIBUTED GENERATION (9 Hrs)

Distributed Generation Technologies - benefits - Utilization Barriers –integration to power grid – Introduction to Renewable Energy Technologies – Micro grids – Advantages and disadvantages of DG – Vehicle to Grid technology and Grid to vehicle technology - Performance and stability analysis in smart grid.

UNIT V POWER QUALITY MANAGEMENT IN SMART GRID

Power Quality - issues - Conditioners - Web based monitoring – Energy Audit - Cyber Security- Power Quality Improvement methods – Introduction to EMC in smart grid.

Text Books

- 1. Janaka Ekanayake, Kithsiri Liyanage, Jianzhong Wu, Akihiko Yokoyama, Nick Jenkins, "Smart Grid Technology and Applications", John Wiley and Sons Publication, 1st Edition, 2015.
- 2. Stuart Borlase, "Smart Grids: Infra structure, Technology and Solutions", CRC Press, 1st Edition, 2013.
- 3. James A. Momoh, "Smart Grid: Fundamentals of Design and Analysis", Wiley-IEEE Press, 1st Edition, 2012.

Reference Books

- 1. Jean Claude Sabonnadiere, NouredineHadjsaid, "Smart Grids", Wiley Blackwell, 1st Edition, 2012
- Fereidoon. P. sioshansi, "Smart grid integrating renewable, distributed and efficient energy", Academic Press, 1st Edition, 2011.
- 3. Tony Flick, Justin Morehouse, "Securing the Smart Grid: Next Generation Power Grid Security", Academic Press, 1st Edition, 2011.
- 4. Krzysztof Iniewski, "Smart Grid Infrastructure and Networking", Tata McGraw Hill, 1st Edition, 2012.
- 5. SawanSen, Samarjit Sengupta, Abhijit Chakrabarti, "Electricity pricing- regulated, deregulated and smart grid systems", CRC press, 1st Edition, 2018.

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- 1. https://nptel.ac.in/noc/courses/noc18/SEM2/noc18-ee42/
- 2. https://onlinecourses.nptel.ac.in/noc19_ee64/preview
- 3. https://www.classcentral.com/course/swayam-introduction-to-smart-grid-14165
- 4. https://npti.gov.in/smart-grid-technologies
- 5. http://www.infocobuild.com/education/audio-video-courses/electronics/IntroductionToSmartGrid-IIT-Roorkee/lecture-04.html

COs/POs/PSOs	Mapping
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	Program Outcomes (POs)											Program Specific Outcomes (PSOs)			
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	3	1	-	-	-	-	-	-	2	2	1	2
2	3	2	2	3	1	-	-	-	-	-	-	2	2	1	2
3	3	2	2	3	1	-	-	-	-	-	-	2	2	1	2
4	3	2	2	3	1	-	-	-	-	-	-	2	2	1	2
5	3	2	2	3	1	-	-	-	-	-	-	2	2	1	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

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DISTRIBUTED GENERATION AND MICROGRIDS

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Course Objectives

- To study the concepts of Distributed Generation and Microgrid.
- To learn about the standards for interconnection.
- To analyze the impact of grid integration.
- To study and analyse the issues in the Microgrid.
- To learn about scenario of renewable energy scenario.

Course Outcomes

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

CO1 - Attain knowledge on the various schemes of conventional and nonconventional power generation.(K2)

CO2 - Have knowledge on the topologies and energy sources of distributed generation. (K2)

CO3 - Learn about the requirements for Microgrid interconnection and its impact. **(K2)**

CO4 - Familiarize with the techniques of control and operation of microgrid. (K2)

CO5 - Comprehend the standards and regulations of distributed generation, microgrid and grid integration. (K2)

UNIT I INTRODUCTION

Distributed generation - overview and technology trends. Working principle, architecture and application of renewable based DG technologies - Non-conventional technology based DGs.

UNIT II DISTRIBUTED GENERATIONS

Concept of distributed generations-topologies-selection of sources- regulatory standards/framework- Standards for interconnecting Distributed resources to electric power systems: IEEE 1547. DG installation classes-security issues in DG implementations - Energy storage elements: Batteries- ultra-capacitors- flywheels-Captive power plants

UNIT III MICROGRID AND IMPACT OF GRID INTEGRATION

Concept and definition -microgrid drivers and benefits- review of sources of microgrids- typical structure and configuration - AC and DC microgrids- Power Electronics interfaces - Requirements for grid interconnection, limits on operational parameters: voltage, frequency- THD- islanding issues- Impact of grid integration with NCE sources on existing power system: reliability-stability.

UNIT IV OPERATION AND CONTROL OF MICROGRID

Modes of operation and control of microgrid: grid connected and islanded mode- Active and reactive power control- protection issues, anti-islanding schemes - microgrid communication infrastructure - regulatory standards- Microgrid economics- Introduction to smart microgrids

UNIT V POWER QUALITY ISSUES

Introduction, Power quality disturbances -Transients, Voltage sags and swells, Over-voltages and undervoltages, Outage, Harmonic distortion, Voltage notching, Flicker, Electrical noise. Power quality sensitive customers, power quality improvement technologies.

Text Books

- 1. Nick Jenkins, Janaka Ekanayake, Goran Strbac, "Distributed Generation", Institution of Engineering and Technology, London, UK, 2010.
- 2. S. Chowdhury, S.P. Chowdhury and P. Crossley, "Microgrids and Active Distribution Networks", The Institution of Engineering and Technology, London, United Kingdom, 2009.
- 3. Math H. Bollen, Fainan Hassan, "Integration of Distributed Generation in the Power System", John Wiley & Sons, New Jersey, 2011.

Reference Books

- 1. Zobaa, Ahmed F., and Ramesh C.Bansal, "Handbook of renewable energy Technology", World Scientific, 2011.
- 2. Godfrey Boyle, "Renewable Energy-Power for a sustainable future", Oxford University Press, 3rd Edition, 2013.
- 3. Nikos Hatziargyriou, "Microgrids: Architectures and Control", Wiley-IEEE Press, 2013

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Page | 38

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- 2. https://www.epa.gov/energy/distributed-generation-electricity-and-its-environmental-impacts
- 3. https://www.energy.gov/eere/solar/solar-integration-distributed-energy-resources-and-microgrids
- 4. https://certs.lbl.gov/research-areas/distributed-energy-resource-0
- 5. https://www.elsevier.com/books/distributed-energy-resources-in-microgrids/chauhan/978-0-12-817774-7

COs		Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	P08	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	3	3	3	2	-	-	-	-	-	-	1	3	3	3	
2	3	3	3	3	2	-	-	1	-	-	-	1	3	3	3	
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5	3	3	3	3	2	-	-	-	-	-	-	1	3	3	3	

COs/POs/PSOs Mapping

Correlation Level: 1 - Low, 2 - Medium, 3 - High

<u>Annexure – II</u>

Academic calendar (IV Year)

Use of Cell Phones

It has been decided not to permit cell phones inside the college campus. If any student is found using the cell phone inside the college campus, it would be confiscated and will not be returned back on any circumstances. Hence the students are instructed not to attend the college with the mobile phones.

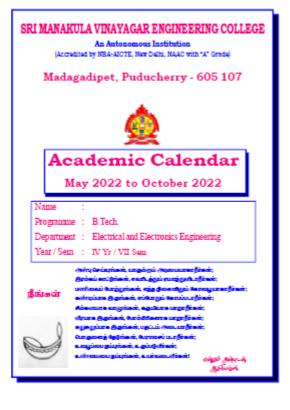
Dress Code

The students are requested to attend the college nearly dressed. While the male students should attend the college with the shirts nearly tacked in and with the shoet, the famale students are permitted to come with churidar and dupatta properly pixed. Students wearing full hand shirts should user it as such without folding it to half set. Casual wears like jeans, T-thirts set, both for boys and girls are strictly prohibited inside the comput. Each department has prescribed uniforms for the labs. The students are requested to strictly adhere to the dress codes as well as the rules and regulations of the college.

Maintenance of Discipline

Discipline is an important factor that shapes one's personality. It is considered as a golden key capable of opening many doors. This institution expects each and every student to follow the rules and regulations in total. Maintaining discipline in the campus will promote a conductive environment for studies.

	(Working hour	2
	Ihour	09.00 am to	09.50 a.m.
	Thour	09.50 a.m. to	10.40 a.m
	Breek	10.40 a.m. to	10.55 a.m
	III hour	10.55 a.m. to	11.45 a.m
	IVhor	11.45 a.m. to	12.35p.m
	Vhour	01.15pm to	02.05pm
	Vihour	02.05pm to	02.55p.m
	Breek	02.55pm to	03.10 p.m
	VIIhour	03.10pm to	04.00 p.m
	VIII hour	04.00 p.m to	04.50 p.m
L	Lanch bro	ak 12.35p.m.	to 1.15 p.m.



About Autonomous

Sri Manakula Vinayagar Engineering College has been conferred with Antonomous Status by the University Grants Commission on 26° September 2019 and the same was approved by Pondicherry University on 19° June 2020. SMVEC Antonomous Regulations R2019, is followed for the students admitted in the Academic Year 2019-20 (present Final Year). SMVEC Antonomous Regulations R2020, is followed for the students admitted from the Academic Year 2020-21 onwards (present first year) & second year)

HIGHLIGHTS OF SMVEC AUTONOMOUS REGULATIONS 2019, 2020 & CURRICULUM

- Industry 4.0 ready curriculum
- Curriculum towards skill development and to create more job opportunities
- Multidisciplinary curriculum
- Oriented towards entreprenurship development
- Choice to learn IELTS / Foreign Languages
- Department wise Gold Medals
- Results will be declared within a month after completion of examinations
- Supplementary Examination in 5ⁿ and δⁿ semester for the students having 2 arrears

Ethnotech/Mandatory course

The Institute has Established 17 Center of Excellence to provide 91 International Certification courses from IBM, Google, Cisco, e Plan, Microsoft, Antodesk, Texas instruments, Festo, Bentley, Schneider Electric, Annacon web services, Siemens, Tally, DELL EMC, Harits Techserv, PTC, LN an Excellence in Technology & Didactic solutions. All students should enroll in certification course from semaster-Ito semaster-VI.

Industrial Training / Internship

Students may undergo training or interaship during summer / winter vacation at Industry/ Research organization. Students are also permitted to undergo interaships during their eighth semester after the completion of theory classes.

SRIMANAKULAVINAYAGAR ENGINEERING COLLEGE

VISION

To be globally recognized for excelence in quality education, innovation and research for the transformation of lives to serve the society.

MISSION

M1: Quality Education: To provide comprehensive academic system that amaigamates the cutting edge technologies with best practices.

M2: Research and innovation: To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.

M3: Employability and Entrepreneurship: To incuicate the employability and entrepreneurial skills through value and skill based training.

M4: Ethioal Values: To instill deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.

DEPARTMENT OF ELECTRICALAND ELECTRONICS ENGINEERING VISION

To promote proficiency in the field of Electrical and Electronics Engineering by creating a stimulating environment for research, innovation and entrepreneurship.

MISSION

M1: Quality Education: To impart high quality technical education with problem solving capabilities by innovative pedagogy in emerging technologies.

M2: Industrial and Societal needs: To cater the dynamic needs of the industry and society by strengthening industry-institute interaction.

M3: Research and Innovation: To nurture the spirit of research attitude by carrying out innovative technologies pragmatically.

M4: Placement and Entrepreneurship: To incuicate the professionalism in career by advancing synergetic skills to compete in the corporate world.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO:)	
PE01: Profeccional Knowledge To possess strong educational foundation in Electrical and Electronic	5

Engineering to attain successful career with professional responsibility PEO2: Innovative Skills

To enrich the skills to design and develop innovative solutions for engineering problems in a multidisciplinary environment

PEO3: Ethios

To actively embrace leadership qualities for achieving professional goals with ethical values

PEO4: Adaptability

To enhance intellectual competency along with technical skills by adapting to the current trends through eternal learning

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Core Proficiency

Utilize the engineering core knowledge to identify, formulate, design, and investigate the complex engineering problems of power electronics, electrical machines and power systems.

PSO2: Cutting Edge Technologies

Explore the new cutting edge technologies in the field of Electric vehicle, Automation, Artificial intelligence, Robotics and Renewable Energy to compete in global market.

PSO3: Design and Evolution

Capability to comprehend the technological advancements with the usage of modern design tools for analysing and designing systems to contront the rapid pace of industrial innovations.

Date	Day	Schedule	Working of Holiday
1	Sat		
2	Sun		Holida
3	Mon	Tentative End Semester Practicals	
4	Tue		
5	Wed	Energy Efficiency Day	
6	Thu		
7	Fri		
8	Sat		
9	Sun		Holida
10	Mon		
11	Tue		
12	Wed		
13	Thu		
14	Fri		
15	Sat		
16	Sun		Holida
17	Mon	Tentative End Semester Theory exam	
18	Tue		
19	Wed		
20	Thu	Bloenergy day	
21	Fri		
22	Sat		
23	Sun		Holida
24	Mon		
25	Tue		
26	Wed		
27	Thu		
28	Fri		
29	Sat		
30	Sun		
31	Mon		_
		Total number of working days : - Total number of holiday : -	

		September 2022	
Date	Day	Schedule	Working day Holiday
1	Thu		78
2	Fri	Third Roview Foodback from the students 3	79
3	Sat	Third Review, OCM 3 Report submission	80
4	Sun		Holiday
5	Mon	Model Exam starts / Teacher's Day	81
6	Tue		82
7	Wed		83
8	Thu		84
9	Fri	World E-vehicle Day / Ozone Day	85
10	Sat		86
11	Sun		Holiday
12	Mon		
13	Tue		
14	Wed		
15	Thu	Engineer's Day	
16	Fri		
17	Sat		Holiday
18	Sun		Holiday
19	Mon		
20	Tue		
21	Wed		
22	Thu	Electrical Motors Day	
23	Fri		
24	Sat		
25	Sun		Holiday
26	Mon	Model practicals	
27	Tue		
28	Wed		
29	Thu		
30	Fri		
		Total number of working days : 09	
		Total number of holiday : 01	
f Gaug	gin and and and and and and and and and an	9 உள்ளைத் தமீர, 6வறு பாராஜம் தடுக்க தாபாற	∧ ú8guž

PROGRAMME 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 engineerin problems and design system components or processes that meet the specific 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 profes engineering solution in societal and environmental contexts, and de knowledge of, and need for sustainable development. onstrate the
- 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.
- POII: 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
- P012: 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 charge.

INDUSTRIAL AUTOMATION AND CONTROL U19EET71

Course Outcomes

After completion of the course, the students will be able to CO1 - Analyze the type of Automation system and its architecture in detail.(K3)

CO2 - Discuss the history of PLC, main parts and its functions. (K3) CO3 - Illustrate the operation of Relays, contactors, Motor Starters, Switched, Sensors,

Output Control Devices, etc., (K3) CO4 - Acquire knowledge about the operation of SCADA and its sub-systems. (K3) CO5 - Demonstrate the fundamentals of Human-Machine Interface. (K3)

U19EET72 ELECTRIC AND HYBRID VEHICLE

Course Outcomes

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

CO1 - Summarize the basics of electric vehicle and its working principle. (K2) CO2 - Combine the different energy storage technologies and its implem ation in hybrid vehicle. (K4)

CO3 - Develop the hybrid electric vehicle with different power converter topology. (K2) CO4 - Review the working of different configurations of electric vehicle and its concepts (K2) CO5 - Describe the working of different configurations of hybrid vehicles. (K2)

U19EEE72 DISTRIBUTED GENERATION AND MICROGRIDS

Course Outcomes

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

CO1 - Attain knowledge on the various schemes of conventional and nonconventional

power generation (K2) power generation (K2) C02 - Have knowledge on the topologies and energy sources of distributed generation (K2) C03 - Learn about the requirements for Microgrid Interconnection and Its Impact. (K2) C04 - Familiarize with the techniques of control and operation of microgrid (K2) C06 - Comprehend the standards and regulations of distributed generation, microgrid and cells interaction. (M2)

grid integration. (K2)

U19EEE73 POWER ELECTRONICS FOR RENEWABLEENERGY SYSTEMS Course Outcomes

After completion of the course, the students will be able to CO1 - Design and analyze the electrical generators for renewable energy conversion (K2) CO2 - Interpret the applications of power electronics in which and solar energy systems. (K2) CO3 - Design different power convertees for renewable energy systems. (K2) CO4 - Analyze standalone and grid connected operating modes of wind, solar energy

systems. (K2)

CO5 - Implement maximum power point tracking algorithm and gain knowledge on hybrid systems. (K2)

Date	Day	Schedule	Working day! Holiday			
1	Mon		55			
2	Tue		56			
3	Wed		57			
4	Thu		58			
5	Fri	Second Review, Feedback from the students - 2	59			
6	Sat	Second Review, QCM 2 Submission	60			
7	Sun		Holiday			
8	Mon	CAT - II	61			
9	Tue	Moharam	Holiday			
10	Wed		62			
11	Thu		63			
12	Fri		64			
13	Sat	Guest Lecture - Solar PV Installation and testing	65			
- 14	Sun		Holiday			
15	Mon	Independance Day	Holiday			
16	Tue	De Jure Transfer Day	Holiday			
17	Wed		66			
18	Thu		67			
19	Fri	Certification course - Industrial Automation	68			
20	Sat	Guest Lecture - Solar Energy (National Renewable Energy Day	69			
21	Sun		Holiday			
22	Mon		70			
23	Tue		71			
24	Wed		72			
25	Thu		73			
26	Fri		74			
27	Sat	Certification course - Effective conference paper writing	75			
28	Sun		Holiday			
29	Mon		76			
30	Tue		77			
31	Wed	Vinavagar Chathurthi	Holiday			
	Total number of working days : 23 Total number of holiday : 08 ະເຮີອ້ຽງລໍ Gastricus ຫຼື ແລ້ວ ແລະ ແມ່ນດີສູງລໍ ແລະ ແລ້ວດີສູງຣາກີ. ະເຫຼີເນລະກໍ ຄູລົດໂລະສຸດ ແລະ ແມ່ນດີແລະການ ແລ້ວດີສູຣາກີ.					

August 2022

		July 2022	
Date	Day	Schedule	Working day/ Holiday
1	Fri		30
2	Sat	Certification course - Design of converters using MATLAS	31
3	Sun		Holiday
4	Mon		32
5	Tue		33
6	Wed		34
7	Thu		35
8	Fri	First Review, Feed back from the students - 1	36
9	Sat	First Review, QCM 1 Submission	37
10	Sun	National testa day - A day of science around the world	Holiday
11	Mon	CAT-I	38
12	Tue		39
13	Wed		40
14	Thu		41
15	Fri		42
16	Sat		Holiday
17	Sun		Holiday
18	Mon		43
19	Tue		44
20	Wed		45
21	Thu		46
22	Frl		47
23	Sat	Certification course - Electric vehicles	48
24	Sun		Holiday
25	Man		49
26	Tue		50
27	Wed	Guest Lecture - Role of PLC in Industrial Automation	51
28	Thu		52
29	Frl	Guest Lecture - Advancement in Industrial Automation	53
30	Sat	Special coaching class / GP / Seminar / GL / Placement / Academic Acbritics	54
31	Sun		Holiday
-	d educe	Total number of working days : 26 Total number of holiday : 08 கட்சியத்தைப் மற்றதுகள் பற்று கொள்வது - வது	

த்தி எல்பது, கட்சயத்தைப் பல i unigi di

ELECTRIC AND HYBRID VEHICLE LAB U19EEP73 Course Outcomes

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

CO1 - Estimate electrical motor power requirement for hybrid electrical vehicle. (K4)

- CO3 Design and analyze the performance electric and hybrid vehicle. (K4) CO3 Analyze the performance of Battery in charging and discharging intervals. (K4) CO4 Troubleshoot and test the control circuits, sensors, actuators used in an E-Vehicle(K4) CO5 Evaluate the electric vehicle performance by mathematical modeling using software.
- (K4)

PROJECT PHASE - I

U19EEW71

Course Outcomes

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

CO1 - Identify the problem statement for the proposed work through the iterature survey. (K3) CO2 - Choose the proper components as per the requirements of the design/system. (K2)

CO3 - Apply the acquainted skills to develop final model/system. (K2)
 CO4 - Estimate, plan and execute the project as a team. (K3)
 CO5 - Defend the finding and conclude with oral/written reports. (K2)

U19EC075 IOT AND ITS APPLICATIONS

Course Outcomes After completion of the course, the students will be able to

CO1 - Understand Internet of Things and its hardware and software components. (K2) CO2 - Demonstrate the Interfacing of I/O devices, sensors and communication modules. (K3)

CO3 - Understand the concepts of remotely monitor data and control devices.(K2)

CO4 - Build and depky an various architecture with their elements.(K3) CO5 - Can develop real time IoT based projects.(K3)

U19ADO74 ARTIFICIAL INTELLIGENCE APPLICATIONS

Course Outcomes

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

CO1 - Apply the concept of data science. (K3) CO2 - Understand the concept of Machine learning. (K2)

CO3 - Understand the concept of Deep Learning. (K2)

CO4 - Apply the design ideas in RPA. (K3) CO5 - Make use of NLP concepts to create chatbot. (K3)

BUSINESS BASICS FOR ENTREPRENEUR U19EEP71

Course Outcomes

After competition of the course, the students will be able to CO1 - Impact comprehensive knowledge of an entrepreneurial ecosystem. (K8)

CO2 - Understand the need and significance of Business Plan in the success of an

Enterprise. (K2) CO3 - Understand the ways to judge the economic and business viability of proposed venture. (K2)

CO4 - Utilize the elements of success of entrepreneurial ventures. (K3)

CO5 - Evaluate the effectiveness of different entrepreneurial strategies. (K5)

U19EEP72 INDUSTRIAL AUTOMATION AND CONTROL LAB

Course Outcomes

After completion of the course, the students will be able to CO1 - Analyze the ladder logic programs and components used for process control.(K2) CO2 - Design PLC-relay logic for the real time applications (K3)

CO3 - Implement Industrial processing system. (K3) CO4 - Design a SCADA monitoring system for real time applications. (K3) CO5 - Diagnose the fault in Power generation and distribution networks, etc. (K3)

Date	Day	Schedule	Working da Holiday
1	Wed		5
2	Thu		6
3	Fri		7
4	Sat	Special scatching class / GP / Seminar / GL / Placement / Academic Arthrities	8
5	Sun		Holiday
6	Mon		9
7	Tue		10
8	Wed		11
9	Thu		12
10	Fri		13
11	Sat	Special spaceting place / GP / Seminar / GL / Placement / Academic Arthritis	14
12	Sun		Holiday
13	Mon		15
14	Tue	Blood Donation Day	16
15	Wed	Career Development Training Ends / National Electricity Day	17
16	Thu		18
17	Fri		19
18	Sat		Holiday
19	Sun		Holiday
20	Mon	Zeroth Review	20
21	Tue	International Yoga Day	21
22	Wed		22
23	Thu		23
24	Fri		24
25	Sat	Special coaching class / GP / Seminar / GL / Placement / Academic Arthrities	25
26	Sun		Holiday
27	Mon		26
28	Tue		27
29	Wed		28
30	Thu		29
		Total number of working days : 26 Total number of holiday : 05	

		May 2022		
Date	Day	Schedule	Working days Holiday	
1	Sun		Holiday	
2	Mon			
3	Tue	Ramzan	Holiday	
4	Wed			
5	Thu			
6	Fri			
7	Sat			
8	Sun		Holiday	
9	Mon			
10	Tue			
11	Wed			
12	Thu			
13	Fri			
14	Sat			
15	Sun		Holiday	
16	Mon			
17	Tue			
18	Wed			
19	Thu			
20	Fri			
21	Sat			
22	Sun		Holiday	
23	Mon			
24	Tue			
25	Wed			
26	Thu			
27	Fri	Commencement of VII semester classes	1	
28	Sat		2	
29	Sun		Holiday	
30	Mon	Career Development Training starts	3	
31	Tue		4	
	Total number of working days : 04 Total number of holiday : 01			
\$ Gaug	ള്ലാം	مع كالأحمة والأور فعال سودي في والله والم	ចត្រូ - ប៉ុណ្តែយដំ	

Supplementary Examinations

Supplementary examination is an additional examination conducted within a month of time after declaring the results of and semester examination. In order to complete the program within 4 years, only the student with maximum of two arrears will be permitted to appear for supplementary examination. The supplementary examination will be conducted in fifth and eighth semester only. For supplementary examination, the continuous assessment marks of the last attempt will be considered.

- stipulated time
 - The industries prefers to recruit students with no standing arrear. If the supplementary examinations is conducted then more number of students will be eligible for the recruitment.

Photo copy of answer book

After the publication of the result, photocopy of the answer books shall be provided to the student on request with stipulated fee fixed by the College from time to time Punctuality in Artendance

The students are requested to keep up punctuality in attending the college. The Inte comers will be losing their attendance and in turn the internal marks. Hence all the students are requested to attend the college in time. A student thall be parmitted to appear for the End Sensetz Examination at the end of the sensetzer only if he/ she secures not less than 75% of overall attendance.

Redo Category

A student who secures over all attendance which is less than 60% has to repeat the course with the approval, when it is next officed.

Tutor Ward System

In the tutor ward system, 30 students are allotted to a tutor who will be taking care of these students. The students are requested to utilize the facility.

Mark: Distribution of Continuous Assessment Marks (CAM) and End Semester Examination Marks (ESM) a for C

		SCE	eme tor Co	OB B B B B B B B B B B B B B B B B B B	100.000		163	t Car	1)		
			Continues Assessment components								
S. No		Test Marks	Average of pre/post test/ viva for each experiment	Average of mariator experiment report for each experiment	Model Exam / Report	Assignment	Review-1	Review-2	Review-3	Attendance	Total
1.	Theory	15	-	-	-	5	-	-	-	5	25
2	Practical	-	10	15	15	-	•	-	-	10	30
3.	Project work	-	-	-	-	-	10	10	20	-	40

The internal marks will be provided fully based on the continuous assessment tests

	Weightage of Assessment for Theory Course						
S.No.	Test	Portion for Test	Test Marks	Duration of Test	Weightage for Internal		
1	CAT 1	1% Units	50	1 % hours			
2	CAT 2	1% Units	50	1 % hours	10		
3	Model	5 Units	75	3 hours	05		
	Continuous Assessment for Theory Course 15						

Question Paper Pattern

uour super FARETR Question paper for CAT and ESE will be based on the patterns shown in Table (a) and (b) Table (a) Question Paper pattern for CAT/Model Exum

Test Type	2 Marks	5 Marks	10 Marks	Total Marks			
CAT1 to 2	5(questions) (10 Marks)	4(questions) (20 Marks)	2 (questions) (20 Marks)	50			
Model	End serve	ester Examinatio	on Question	75			
		Pattern					
Table (b)	Table (b) Question paper pattern for End semester Examination(ESE)						
2 Marks	63.C						
2 Marks	5 Mar	85	10 Marks	Total Marks			

Important point: for the kind attention of the Parent:

Dear Parent

The VII semester classes commences on 27th May 2022. The above The VII semester classes commences on 2/* Alay 2022. The show mentioned semester is a very short term, including working days meant for model exam. The student have to complete a lot of work within a short period. Hence the parents are kindly requested not to permit their wards to swall frequent leave during this semester period for the following reasons.

VII semester(IVYear) : All the VII semester papers are considered as analytical papers. Hence, regular attendance and more concentration are required to clear these semester papers.

Marks in the continuous assessment test decide the major part of the continuous assessment marks. So, availing leave for the continuous assessment test must be avoided at any cost as this would seriously affect the continuous assessment marks

Practicals are very important not only to score more marks but also it utill help to understand the theory part of the subject, hence achice your ward not to avail leaves during practical classes.

Please spare your valuable time to talk to your son/daughter every day and try to understand what he/she is doing in respect of his/her studies. Kindly extend all your support to your son/daughter which will help them to come out successfully. For any assistance from our side your may always feel free to contact the respective Coordinator / HOD any time during the working hours.

Gold Medal: and Top Ten Rank:

Your seniors were incore, hard working and got the Goldmedals of the Ponticherry University and the top ten ranks in all the branches. The details of the University Goldmedals and Top Ten Ranks won by the students are given below. 🖷 Indicates the Gold medal and University First Rank.

For the Award of Oold Medal and ranks for each branch of study, the COPA secured from 1 to 8° semester alone should be considered and it is mandatory that the candidate should have assed all the subjects from 1* to 8* semester in the first attempt. Rank certificates would be issued to the first five candidates in each branch of study.

Name of the		Year	
Course	2017	2018	2019
BTack EEE	2, 4, 6, 7	8	2346789 10
BTack ECE	2,3,4,5,6,7,8,9,10		9 3,4567,9,10
BTash CSE	👷 ,2, 3, 4, 10		P ,2,4,6,7,8,10
BTach IT	2,3,4,5,6,7,8,9,10	8	\$ 2,3,5,6,8
BTash KE	2,3,4,5,6,7,8,9,10	Ŕ	23,4,5,6,7,8,9,10
BTach Made	4, 5, 7, 9, 10		3,7,8,10
BTach Civil	2, 3, 10		2,3,4,6,7,10
MCA	3,4,7,9,10	8	R2,67,8,9,10,11
MBA	\$3,4,6,7,8		2,3,4,5,7,8,10
MTash CSE	2,3,4,5,7,8,9		R 2
MTada ECE	2, 3, 6, 7, 8, 9		23,45
MTada PED	*		R 23
MTech NW	2, 3, 4, 5, 7, 8, 9		2,3
MTech(VLSI)	*		% ,2,3,4
MTach(MF)	¶.2		*

Distribution of Attendance marks for theory : 5 marks

The distribution of 5 marks for theory class attendance is as follows : 5 marks for 95% attendance and above 4 marks for 90% attendance and above but below 95% 3 marks for 85% attendance and above but below 90% 2 marks for 85% attendance and above but below 85% 1 mark for 75% attendance and above but below 85%

Distribution of Attendance marks for practical : 10 marks

The distribution of 10 marks for practical class attendance is as follows : 10 marks for 95% attendance and above but below 95% 6 marks for 95% attendance and above but below 95% 4 marks for 80% attendance and above but below 95% 2 marks for 75% attendance and above but below 85%

Note :

Students should not be absent for the online classes/regular classes. Attendance for the online classes/regular classes are monitored regularly and it is recorded. Continuous assessment mark will be based on the performance of the students in the continuous assessment test, ent and attendance percentage. assign

Assignments : 5 marks

Out of 25 continuous assessement marks, 5 marks will be awarded for the assignment. The assignment questions will be different for each and every student. The students have to submit 3 assignments in each subject. Best of 2 $\,$ out of 3 assignments will be consider.

Women Cell

For the benefit of the girl students, a Woman Cell has been constituted in the college. The girl students may approach the Chairperson / members for assistance.

Grievance Redressal Cell

There is a Grievance Redressal Cell under the Chairmanthip of the Director of the institution. Students are requested to approach the Chairman / members to redress their grievances. Mail ID : grievance@amvec.ac.in

Importance of Continuous Assessment Marks(CAM)) Г		I	Incoment and Training	g Di	vizion	
The continuous assessment marks once earned are carried over to the subsequent	3	The placeme	nt cell fur	actions round the clock multinational compani	thro	ughout the year to est	ablish
exams also. Hence the students are requested to work hard to get the maximum contineus assessment marks. If the continuous assessment marks are lower, it will		reanizations	and play	s an important role in lo		ng parious job opports	mitios
pull down chances of getting the first class, distinction, gold medals and ranks.				or of the students every			
	I I'		~ _	ctivities of the Trainin	·		
Importance of CAT-I/CAT-II/Model Examination	I L	4		for personality and interp			
Continuous assessment marks are awarded for the performance in the CAT-I, CAT-II &				to get in plant training		uai saut development.	
Model Exam. Hence all the students are requested to prepare well for each test /		Arranges					
examination to earn the maximum continuous assessment marks.		Creates at	wareness o	in the opportunities oper lasses for GATE, GRE, T	, fg	higher studies.	
Undertaking Minor / Major Projects	'	Bacemen				Students : 2021-22	
		Andresia	Condense	MST Rober Services	_	Microchip	3
Each student is advised to take atleast one minor project. Involving in the project will be helping to understand the basics of the subject. Some of the minor / major		Year				TCS-Digital	9
project will also be benefiting the society. Moreover, the Management awards cash		2013-14		ZOHO		KAAR	2
prizes for the best projects in each department.						Virtusa	17
		2014-15	2078	CTS-Genc		EmbedUK.	1
Participation in the Curricular / Co-curricular / Extra curricular Activities		2015-16	95%	Wipro	147	AM	
All the students are encouraged to participate in the curricular / co-curricular / extra		2016-17	93%	Min Sigma		NTT Data	4
curricular activities. Involvement in these activities will improve their knowledge				Hermon		Excelacom	3
level in the subject. If a student or a team gets cash prize / award in the technical		2017-18	95%	CTS Genc-Elevate		Support Studio Tech	3
event organized by the recognised institutions, then the management of this		2018-19	95%	Econ		Secure Kloud	10
institution will also sanction an amount equivalent to the winning award / cash prize		2019-20	95%	Mindue		CEEAS	4
as a token of appreciation.		2020-21	96%	Oala		Tech Mahendra	10
Leave Account Record				MicroChip Technologies		Forbes Marshall	2
		2021-22	90%	Capganini HCL Technology		RK Power Gen Pvt.	2
For each student, leave account record has been provided. The students are						Rampal Pvt. Ltd	2
instructed to show the leave record to their parents and strictly adhere to the				Infosys India Notion Electrical		Adroit Soft	33
instructions given for availing the leave. The leave account record should be						Unisys	11
maintained properly and prior approval must be obtained for availing the leave. In				Eaton		Skolar Academy	11
exceptional cases, the students are permitted to get the approval after availing the leave.				My Medical Shop		others	59
Transport Facility				Voltech	16		
				Appasanty Associates	4		*897
61 buses have been arranged for the students to reach the college from Puducherry,	I I			Wi-Fi Campu	5	 till May 2022 	
Kanagachettikulam, Vilhpuram, Neyveli, Panruti, Cuddalore, Nellikuppam,		Our campus	has been e	anabled by high speed u	nint	errupted Wi-Fi connec	tivity.
Madukarai, Tindivanam, Tiruvannamalai and virudhachalam covering almost all the areas. Separate transport facility has been arranged fir the students who remain in the				open till 8.00 p.m. on a	ll th	e working days except (on the
college after 5p m for utilizing computer lab, library and sports facilities. The students are		lates of Univ	ersity exa	minations.			
requested to utilise the transport facility.				Library Working I	Iow	2	
All the students are requested to avoid mobile phones and travel by two wheelers	1	0.20		30 p.m. (On all the work			
considering their safety and security.		8.30	a.m. to a.	00 p.m. (On all the work). 00 p.m. (During the exc	щę	ation data)	
	, L	0.30	a.m. 10 IV	www.hum.fromm8.me.ees		acce eays)	

Academic calendar (II Year)

Use of Cell Phones

It has been decided not to permit cell phones inside the college campus. If any student is found using the cell phone inside the college campus, it would be confiscated and will not be returned back on any circumstances. Hence the students are instructed not to attend the college with the mobile phones.

Dress Code

The students are requested to attend the college nearly dressed. While the male students should attend the college with the shirts nearly tucked in and with the shoet, the female students are permitted to come with churider and dupatts properly pined. Students wearing full hand shirts should wear it as such without folding it to half etc. Casual wears like jeans, T-shirts etc., both for boys and girls are strictly prohibited inside the campus. Each department has prescribed uniforms for the labs. The students are requested to strictly adhere to the dress codes as well as the rules and regulations of the college.

Maintenance of Discipline

Discipline is an important factor that shapes one's personality. It is considered as a golden key capable of opening many doors. This institution expects each and every student to follow the rules and regulations in total. Maintaining discipline in the campus will promote a conducive environment for studies.

	Working hour	1
Ihour	09.00 a.m. to	09.50 a.m
Ilhour	09.50 a.m. to	10.40 a.m
Break	10.40 a.m to	10.55 a.m
IIIhour	10.55 a.m. to	11.45 a.m
IVhour	11.45a.m to	12.35pm
Vhour	01.15 p.m. to	02.05p.m
Vibor	02.05 p.m to	02.55p.m
Break	02.55 p.m to	03.10p.m
VII hour	03.10 p.m to	04.00p.m
VIII hour	04.00pm to	04.50 p.m
Lunch bre	ak 12.35p.m. t	o 1.15 p.m.

About Autonomous

Sri Manakula Vinayagar Engineering College has been conferred with Autonomous Status by the University Grants Commission on 26° September 2019 and the same was approved by Pondicherry University on 19° June 2020. SMVEC Autonomous Regulations R2019, is followed for the students admitted in the Academic Year 2019-20 (present final Year). SMVEC Autonomous Regulations R2020, is followed for the students admitted from the Academic Year 2020-21 onwards (present first year & second year).

HIGHLIGHTS OF SMVEC AUTONOMOUS REGULATIONS 2019, 2020 & CURRICULUM

- Industry 4.0 ready curriculum
- Curriculum towards skill development and to create more job opportunities
- Multidisciplinary curriculum
- Oriented towards entreprenurship development
- Choice to learn IELTS / Foreign Languages
- Department wise Gold Medals
- Results will be declared within a month after completion of examinations
- Supplementary Examination in 5ⁿ and 8ⁿ semester for the students having 2 arrears

Ethnotech/Mandatory course

Emmotech / Mandatory course The Institute has Established 17 Center of Excellence to provide 91 International Certification courses from IBM, Google, Cisco, e Plan, Microsoft, Antodeak, Texas instruments, Festo, Bentley, Schneider Electric, Amazon web services, Siemens, Tally, DELL EMC, Farita Techsert, PTC, LN an Excellence in Technology & Didactic solutions. All students should enroll in certification course from senseter-1to senseter-VI.

Industrial Training / Internship

Students may undergo training or interachip during summer / winter vacation at Industry / Research organization. Students are also permitted to undergo interachips during their eighth semester after the completion of theory classes.



September 2022

September 2022				
Date	Day	Schedule	Working day Holiday	
1	Thu		70	
2	Fri		71	
3	Sat		72	
4	Sun		Holiday	
5	Mon	Teacher's Day	73	
6	Tue		74	
7	Wed		75	
8	Thu	Model Practicals		
9	Fri	World E-vehicle Day		
10	Sat			
11	Sun		Holiday	
12	Mon			
13	Tue			
14	Wed	Tentative ES practical		
15	Thu	Engineer's Day		
16	Fil	World Ozone Day		
17	Sat		Holiday	
18	Sun		Holiday	
19	Mon			
20	Tue			
21	Wed			
22	Thu	Electrical Motors Day		
23	Fri			
24	Sat			
25	Sun		Holiday	
26	Mon			
27	Tue			
28	Wed			
29	Thu			
30	Fri	Tentative End Semester Theory exam starts		
		Total number of working days : 08 Total number of holiday : 01		
g Gaug	ള്ലാംക	ومنجو فالإجتباع والله والله والله والمعالية وه	j n úliguð	

August 2022

		August 2022	
Date	Day	Schedule	Working day/ Holiday
1	Mon	Certification course - Practical approach inselection of microcomboliers	47
2	Tue		48
3	Wed		49
4	Thu		50
5	Fri		51
6	Sat	Guest lecture - Electric safety	52
7	Sun		Holiday
8	Mon	Certificate course - PIC Microcontroller applications	53
9	Tue	Moharam	Holiday
10	Wed		54
11	Thu		55
12	Fri	Feedback from the students - 3	56
13	Sat	öperkel somkling riksta i BP i Somitsar i BL i Pärvon vel i Asadonis Anfrédius / BCB & Buteriatako	57
14	Sun		Holiday
15	Mon	Independance Day	Holiday
16	Tue	De Jure Transfer Day	Holiday
17	Wed	Model Exam starts	58
18	Thu		59
19	Fri		60
20	Sat	National Renewable Energy Day	61
21	Sun		Holiday
22	Mon		62
23	Tue	Model Exam ends	63
24	Wed		64
25	Thu	Certificate course - SQL	65
26	Fri		66
27	Sat	Guest lecture - Wind energy technology	67
28	Sun		Holiday
29	Mon		68
30	Tue		69
31	Wed	Vinayagar Chathurthi	Holiday
		Total number of working days : 23	
		Total number of holiday : 08	110-0
-00 jp		வன் தல்வாத வாய்ப்பிலும் உன்ன ஆபத்தைப் ப	readigent.

- கத்தும் கொண்ணை இல்லாகு வாய்பத்தும் உன்ற இருந்தைப் பார்க்கும் சாறிப்பான் தவ்வாகு ஆபத்திலும் உன்ன வாய்பிகளைப் பார்க்கிறான்.

SRIMANAKULAVINAYAGAR ENGINEERING COLLEGE VISION To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society. MISSION M1: Quality Education: To provide comprehensive academic system that amaigamates the cutting edge technologies with best practices. M2: Research and Innovation: To foster value-based research and inno in collaboration with industries and institutions globally for creating intellectuals with new avenues. M3: Employability and Entrepreneurship: To incuicate the employability and entrepreneurial skills through value and skill based training.

M4: Ethioal Values: To instil deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.

DEPARTMENT OF ELECTRICALAND ELECTRONICS ENGINEERING

VISION

To promote proficiency in the field of Electrical and Electronics Engineering by creating a stimulating environment for research, innovation and entrepreneurship.

MISSION

M1: Quality Education: To impart high quality technical education with problem solving capabilities by innovative pedagogy in emerging technologies.

M2: Industrial and Societal needs: To cater the dynamic needs of the industry and society by strengthening industry-institute interaction.

M3: Research and Innovation: To nurture the spirit of research attitude by carrying out innovative technologies pragmatically

M4: Placement and Entrepreneurship: To incuicate the professionalism in career by advancing synergetic skills to compete in the corporate world.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO:)

PE01: Professional Knowledge To possess strong educational foundation in Electrical and Electronics Engineering to attain successful career with professional responsibility PEO2: Innovative Skills

To enrich the skills to design and develop innovative solutions for engineering problems in a multidisciplinary environment

PEOS: Ethios

To actively embrace leadership qualities for achieving professional goals with ethical values

PEO4: Adaptability

To enhance intellectual competency along with technical skills by adapting to the current trends through eternal learning

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Core Proficiency

Utilize the engineering core knowledge to identify, formulate, design, and investigate the complex engineering problems of power electronics, electrical machines and power systems.

PSO2: Cutting Edge Technologies

Explore the new cutting edge technologies in the field of Electric vehicle, Automation, Artificial intelligence, Robotics and Renewable Energy to compete in global market.

PSOS: Design and Evolution

Capability to comprehend the technological advancements with the usage of modern design tools for analysing and designing systems to confront the rapid pace of industrial innovations.

Date	Day	Schedule	Working day Holiday
1	Fri		22
2	Sat	Certification course - Battery Technology	23
3	Sun		Holiday
4	Mon		24
5	Tue		25
6	Wed		26
7	Thu		27
8	Fri		28
9	Sat	Guest lecture - Advanced Software Technologies used in industries	29
10	Sun	National tesia day - A day of science around the world	Holiday
-11	Mon		30
12	Tue		31
13	Wed	Certification course - Occupational Health and Safety	32
14	Thu	Feedback from the students - 2	33
15	Fri	GCW2 submission	34
16	Sat		Holiday
17	Sun		Holiday
18	Mon	CAT-II	35
19	Tue		36
20	Wed		37
21	Thu		38
22	Fri		39
23	Sat	Quest leature - Advanced Microcontrollers for Drives	40
24	Sun		Holiday
25	Mon	Guest leature - Energy Storage System and its applications	41
26	Tue		42
27	Wed		43
28	Thu		44
29	Fri	Industrial Visit	45
30	Sat	Industrial Visit	46
31	Sun		Holiday
		Total number of working days : 26 Total number of holiday : 08	
Genty	d educes	லட்சியத்தைப் பழப்படியாகப் புரித்து கொண்டிது உதைப	

1 2 3	Wed		Holiday
			Holiday
	Thu		Holiday
	Fri		Holiday
4	Sat		Holiday
5	Sun		Holiday
6	Mon		3
7	Tue		4
8	Wed		5
9	Thu		6
10	Fri		Holiday
11	Sat		Holiday
12	Sun		Holiday
13	Mon		7
14	Tue	Blood Donation Day	8
15	Wed	National Electricity Day	9
16	Thu		10
17	Fri		11
18	Sat		Holiday
19	Sun		Holiday
20	Mon		12
21	Tue	International Yoga Day	13
22	Wed		14
23	Thu		15
24	Fri	Feedback from the students - 1	16
25	Sat	Industrial Visit	17
26	Sun		Holiday
27	Mon	CAT-I	18
28	Tue		19
29	Wed		20
30	Thu		21
		Total number of working days : 18 Total number of holiday : 11	

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 engineerin problems and design system components or processes that meet the specific 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 conte to assess societal, health, safety, legal and cultural issues and responsibilities relevant to the professional engineering practice. steal loss es and the co 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

PROGRAMME OUTCOMES (POs)

- communication: communicate a network of complex engineering activates 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.
- POII: 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
- P012: 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 charge.

PROBABILITY AND STATISTICS

U20BST430

- Course Outcomes After completion of the course, the students will be able to
- CO1 Apply the concept of probability in random variables.(K3) CO2 Apply the basic rules of continuous random variables.(K3) CO3 Understand the basic concepts of Statistics.(K2)
- CO4 Derive the inference for various problems using testing of hypothesis in large m. (K3) CO5 - Solve the problems related to testing of hypothesis in small samples. (K3)
- PROGRAMMING IN JAVA

U20EST467

Course Outcomes

Course Outcomes After completion of the course, students will be able to CO1 - Write a maintainable java Program for a given algorithm and implement the

CO1 - Write a matrixinable java Program for a given aportism and implement th same. (K2) CO2 - Demostrist the use of inhetano, induce and package in relevent applications. (K3) CO3 - Create java applications using exception handling, thread and generi programming. (K3) CO4 - Examplify simple graphical user interfaces using CUI components and databas programs. (K3) U20EET411

MEASUREMENTS AND INSTRUMENTATION

FOR ELECTRICAL ENGINEERING

After completion of the course, the students will be able to CO1 - Acquire knowledge on the characteristics of measuring instruments and their classification (K2)

classification (NZ) OO2 - Conversant in construction, working of AC / D.C meters and their proficient use. (K3) CO3 - Acquire knowledge in various methods of digital meters and its measurement. (K3) CO4 - Acquire knowledge on construction and working principle of various types of display devices and bridge comparison methods for R, L and C measurement. (K3) CO4 - Demonstrate the various types of transducers used for physical measurements.

U20EET412 MICROPROCESSOR AND MICROCONTROLLER

Course Outcomes After completion of the course, the students will be able to CO1 - Illustrate the architecture of microprocessor and to developskills in writing assembly

language program.(K3) CO2 - Have a clear understanding of microcontroller architecture with functional details of each pin.(K3)

COS - write and debug Assembly and C programs for 8 bit Microcontroller.(K3) CO4 - Interface input/output peripheral devices and to implement the advanced communication protocol like PC and SPI using PIC Microcontroller.(K4) CO5 - Design and develop microcontroller based real-time applications. (K4)

May 2022 Date Schedule rking da Day 1 Sun Holiday Mon Tue Ramzan 3 Holiday Wed 4 Thu E Frl 6 Sat 8 Sun Holiday 9 Mon 10 Tue Wed 12 Thu Fri 13 14 Sat 15 Sun 16 Mon Holiday 17 Tue Wed 18 19 Thu 21 Sat Holiday 22 Sun 24 Tue 25 Wed 26 Thu Fri Commencement of IV semester classes 27 28 Sat 2 29 Sun Holiday Mon Holiday 31 Tue Holiday Total number of working days : 02

Total number of holiday : 03

தீ வெற்றியடையதை உள்ளைத் தனிர, வேறு மாராலும் தடுக்க அடியாறு ~ ப்ரெயர்

Important points for the kind attention of the Parents

Dear Parent

Dear Parent The IV semester classes commences on 27* May 2022. The above mentioned semester is a very short term, including working days meant for model exam. The students have to complete a lot of work within a short period. Hence the parents are kindly requested not to permit their wards to avail frequent leave during this semester period for the following reasons.

IV semester (IIYear): All the IV semester papers are considered as analytical papers. Hence, regular attendance and more concentration are required to clear these semester papers.

Marks in the continuous assessment test decide the major part of the continuous assessment marks. So, availing leave for the continuous assessment test must be avoided at any cost as this would seriously affect the continuous assessment marks.

Practicals are very important not only to score more marks but also it will help to understand the theory part of the subject, hence advice your ward not to avail leaves during practical classes.

Please spare your valuable time to talk to your son/daughter every day and try to understand what he'she is doing in respect of his/her studies. Kindly extend all your support to your son/daughter which will help them to come out successfully. For any assistance from our side you may always feel free to contact the respective Coordinator / HOD any time during the working hours.

U20EEE401

ELECTRICAL SAFETY ENGINEERING

Course Outco

Course Outcomes After completion of the course, the students will be able to CO1 - Describe the Indian Electricity (IE) acts and various rules for electrical safety.(K1) CO2 - Expose safety measures to prevent electrical shock in handling of domestic

electrical appliances. (K2) CO3 - Evaluate the safety aspects during installation of plant and equipment. (K3) CO4 - Describe the various hazardous area and application of electrical safety in various

places. (K1) COS- Acquire knowledge about importance of electrical safety training to improve quality

management in electrical systems. (K2)

U20EEE406 ENERGY STORAGE TECHNOLOGY

Course Outcomes

Course Outcomes After completion of the course, the students will be able to CO1 - Familiarize the need for energy storing (K2) CO2 - Analyze the various energy storings techniques in the form of electrical, magnetic and chemical systems. (K3) CO3 - Analyze the different batteries and its characteristics used for storing the energy in electric vehicles, nano-tubes etc.(K4) CO4 - Impart the concepts of Superconducting Magnet Energy Storage Systems and super-capacitors in digital cameras, PC cards, electric vehicles, medical applications etc.(K3)

super-ca etc.(K3) etc.(K3) COS - Analyze the various energy storage techniques used in Electric vehicles and its hybridization concepts, power grid stabilization, rail-system power models etc.(K4)

ENGINEERING COMPUTATION WITH MATLAB U20ECO401

Course Outcomes

Course Outcomes After completion of the course, the students will be able to CO1 - State the basics of MATLAB. (K1) CO2 - Explain how to work with matrices, and their operations. (K2) CO3 - Use the MATLAB functions relevant to communication engineering. (K3) CO4 - Demonstrates various file operations in MATLAB. (K3) CO5 - Applying the plotting capabilities of MATLAB effectively to various systems. (K3)

WEB DEVELOPMENT

1120C80401

Course Outcomes After completion of the course, the students will be able to CO1 - Develop basic web applications. (K5) CO2 - Design the web applications using CS8. (K5) CO3 - Validate the web pages using jana scripts functions. (K5) CO4 - Demonstrate the web 2.0 application to advance scripts. (K3) CO5 - Update the knowledge of XML Data. (K4)

Supplementary Examinations

mination is an additional examination conducted within a Supples sentary exam Support the start declaring the results of end semester examination. In order to complete the program within 4 years, only the student with maximum of two arrears will be permitted to appear for supplementary examination. The supplementary examination will be conducted in fifth and eighth semester only. For supplementary examination, the continuous assessment marks of the last attempt will be considered.

Benefits

- A More number of students will receive the degree within the stipulated time
- The industries prefers to recruit students with no standing arrear. If the supplementary examinations is conducted then more number of students will be eligible for the recruitment

Photo copy of answer book

After the publication of the result, photocopy of the answer books shall be provided to the student on request with stipulated fee fixed by the College from time to time **Punctuality in Attendance**

The students are requested to keep up punctuality in attending the college. The late comers will be loting their attendance and in turn the internal marks. Hence all the students are requested to attend the college in time. A student thall be permitted to appear for the End Sensetre Examination at the senseter only if he / she secures not less than 75% of overall attendance.

Redo Category

A student who secures overall attendance which is less than 60% has to repeat the course with the approval, when it is next offered.

Tutor Ward System

In the tutor ward system, 30 students are allotted to a tutor who will be taking care of these students. The students are requested to utilize the facility.

Gold Medal: and Top Ten Rank: Your seniors were sincere, hard working and got the Gold models of the Pendicherry University and the top ten ranks in all the branches. The details of the University Goldmedals and Top Ten Ranks won by the students are given below. 🦷 Indicates the Gold medal and University First Rank. For the Award of Gold Medal and ranks for each branch of study, the COPA secured from 1" to alone should be considered and it is mandatory that the o didate should h used all the subjects from 1* to 8* semester in the first attempt. Rank certificates would be issued to the first five candidates in each branch of study. Year Name of the Course 2017 2018 2019 Blich EEE 2467 023,46,78,9,10 \$4,5,6,7,9,10 BTach ECE 2,3,4,5,6,7,8,9,10 **R**,2,4,6,7,8,10 BTach CSE 🏆 ,2, 3, 4, 10 2,3,5,6,8 2,3,4,5,6,7,8,9,10 Blich II Ÿ, 2,3,4,5,6,7,8,9,10 2,3,4,5,6,7,8,9,10 Blich IE B.Tach Mada 🧖 ,4,5,7,9,10 3,7,8,10 Blich Civil 2,3,10 23.4.67.10 R26,7,8,9,10,11 MCA 3,4,7,9,10 MBA 🖷 3,4,6,7,8 23,4,5,7,8,10 Mīksh CSE 🦷 2, 3, 4, 5, 7, 8, 9 82 23,4,5 Miksh ECE 2, 3, 6, 7, 8, 9 Milich PHD **Q**23 R MINE NW 9 2, 3, 4, 5, 7, 8, 9 **R**23 **%**,2,3,4 MTeb(MLSD 1 MTach(MF) **%**.2

Placement and Training Division							
		actions round the clock					
contact with	reputed	multinational compani	85 , 1	well established indu	istrial		
		s an important role in le					
and placing la	u de mumy	or of the students every)	ear.	at these organizations.			
	A	ctivities of the Trainin	g D	ivition			
		for personality and interp	90.00	nal skill development.	.		
		to get in-plant training		-			
 Arranges i 	ndustrial	visits	_				
♦ Creates av ♦ Arranges o	vareness (coaching (on the opportunities oper classes for GATE, GRE, T	for IOFI	higher studies. EL, TELTS, IAS, IES et	c.		
Placement	Record	Details of Pla	aced	Students : 2021-22			
Academic	Students		18	Microchip	3		
Year	Placed	VL and Engg. & Const		TCS-Digital	9		
2013-14	85%	ZOHO	8	KAAR	22		
2014-15	95%	TCS-Ninia		Virtusa	17		
		CTS-Genc	190	EmbedUK.			
2015-16	95%	Wipro	147	AMI			
2016-17	93%	Mn Sirma		NIT Data	4		
		Haman	4	Excelatom	3		
2017-18	95%	CTS Genc-Elevate	15	Support Studio Tech	5		
2018-19	95%	Econ	1	Secure Kloud	10		
2019-20	95%	Minduree	27	CEDAS	4		
2020-21	96%	Oala	1	Tech Mahendra	10		
2020-21	90%	MicroChip Technologies		Forbes Marshall	2		
2021-22	90%	Capgonini	14	RKPower GenPvt.	2		
		HCL Technology	- 5	Rampal Pot. Ltd	2		
		Infosys	14	Adroit Soft	- 33		
		India Nippon Electrical		Unisys	11		
		Eaton	4	Skolar Academy	11		
		My Medical Shop	3	others	59		
		Voltech	16				
		Appasanty Associates	2	Total	*897		
		Wi-Fi Campu		* till May 2022			
Our campus l	as been	enabled by high speed u	mint	arrupted Wi-Fi connec	tivity.		
The Computer	The Computer Centre is open till 8.00 p.m. on all the working days except on the						
dates of University examinations.							
		Library Working I	low	3			
8.30	a.m. to 8.	30 p.m. (On all the work	ing é	lays)			
8.30	a.m. to 10	0.00 p.m. (During the ex	min	ation days)			

Mark: Distribution of Continuous Assessment Marks (CAM) and End Semester Examination Marks (ESM) Scheme for Continuous Assessment Text/CAT)

9

	Scheme for Continuous Assessment Test(CAT)										
			Continues Assessment components								
S. No	Course Type	Test Marks	Average of pre/post test/ viva for each experiment	Average of mariation experiment report for each experiment	Model Exam / Report	Assignment	Review-1	Review-2	Review-3	Attendance	Total
1	Theory	15	-	-	-	5	-	-	-	5	25
2	Practical	-	10	15	15	-	-	-	-	10	50
3	Project work	-	-	-	-	-	10	10	20	-	40
The	internal marl	es sui	l be provi	ded fully be	sed a	n the	0.000	tinne			ment

Weight and Annual for Theory Co.

tests

	weightage of Assessment for Theory Course							
S.No.	Test	Portion for Test	Test Marks	Duration of Test	Weightage for Internal			
1	CAT 1	1% Units	50	1 % hours				
2	CAT2	1% Units	50	1 % hours	10			
3	Model	5 Units	75	3 hours	05			
	Continuous Assessment for Theory Course							

Question Paper Pattern Question paper for CAT and ESE will be based on the patterns shown in Table (a) and (b)

		Model Eram

Test Type	2 Marks	5 Marks	10 Marks	Total Marks	
CAT 1 to 2	5(questions) (10 Marks)	4(questions) (20 Marks)	2 (questions) (20 Marks)	50	
Model	End sem	End semester Examination Question			
Table (b) (Question paper p	attern for End s	emester Examina	tion(ESE)	
2 Marks	5 Mar	ks	10 Marks	Total Marks	
10(20 Marks)	5 (25 M		3 (30 Marks) ut of 5 questions)	75	

Distribution of Attendance marks for theory : 5 marks

The distribution of 5 marks for theory class attendance is as follows : 5 marks for 95% attendance and above

4 marks for 90% attendance and above but below 95% 3 marks for 85% attendance and above but below 90% 2 marks for 80% attendance and above but below 85%

1 mark for 75% attendance and above but below 80%

Distribution of Attendance marks for practical : 10 marks

The distribution of 10 marks for practical class attendance is as follows : 10 marks for 95% attendance and above 8 marks for 95% attendance and above but below 95% 6 marks for 85% attendance and above but below 95% 2 marks for 85% attendance and above but below 85% 2 marks for 75% attendance and above but below 85%

Note :

Students should not be absent for the online classes/regular classes Attendance for the online classes/regular classes are monitored regularly and it is recorded. Continuous assessment mark will be based on the performance of the students in the continuous assessment test, assign ent and attendance percentage.

Assignments : 5 marks

Out of 25 continuous assessment marks. 5 marks will be awarded for

the assignment. The assignment questions will be different for each and every student. The students have to submit 3 assignments in each subject. Best of 2 out of 3 assignments will be consider.

Women Cell

For the banefit of the girl students, a Woman Cell has been constituted in the college. The girl students may approach the Chairperson / members for assistance.

Grievance Redressal Cell

There is a Grievance Redressal Cell under the Chairmanship of the Director of the institution. Students are requested to approach the Chairman / members to redress their grievances. Mail ID : grievance@amvec.ac.in

Importance of Continuous Assessment Marks(CAM) The continuous assessment marks once earned are carried over to the subseque exams also. Hence the students are requested to work hard to get the maxim continuous assessment marks. If the continuous assessment marks are lower, it w mous assessment marks are lower, it will pull down chances of getting the first class, distinction, gold medals and ranks.

Importance of CAT-I/CAT-II/Model Examination

Continuous assessment marks are awarded for the performance in the CAT-I, CAT-II & Model Exam, Hence all the students are requested to prepare well for each test / examination to earn the maximum continuous assessment marks.

Undertaking Minor / Major Projects

Each student is advised to take atleast one minor project. Involving in the project will be helping to understand the busics of the subject. Some of the minor / major project will also be benefiting the society. Moreover, the Management awards cash prizes for the best projects in each department.

Participation in the Curricular / Co-curricular / Extra curricular Activities

All the students are encouraged to participate in the curricular / co-curricular / extra curricular activities. Involvement in these activities will improve their knowledge level in the subject. If a student or a team gets cash prize / award in the technical event organized by the recognized institutions, then the management of this institution will also sucction an amount equivalent to the winning sward / cash prize a status of former sidier. as a token of appreciation.

Leave Account Record

For each student, leave account record has been provided. The students are instructed to show the leave record to their parents and strictly adhere to the instructions given for availing the leave. The leave account record should be maintained properly and prior approval must be obtained for availing the leave. In exceptional cases, the students are permitted to get the approval after availing the leave.

Transport Facility

(France to the students to reach the college from Pudncherry, Kanagachettikulam, Villupuram, Neyveli, Panruti, Cuddalore, Nellikuppam, Madakarai, Tindivanam, Tiruyamannalai and tirudhachalam covering almost all the college after 5p m for reliking computer lab, library and sports facilities. The students are requested to utilise the transport facility. All the students are requested to utilise the transport facility in the phones and travel by two wheelers considering their safety and security.

Academic calendar (I Year)

Use of Cell Phones

It has been decided not to permit cell phones inside the college campus. If any student is found using the cell phone inside the college campus, it would be confiscated and will not be returned back on any circumstances. Hence the students are instructed not to attend the college with the mobile phones.

Dress Code

The students are requested to attend the college nearly dressed. While the male students should attend the college with the shirts nearly tucked in and with the shoet, the famale students are permitted to come with churidar and dupatta properly pined. Students wearing full hand shirts should user it as such without fidding it to half stc. Casual users like jeans, T-shirts etc., both for boys and girls are strictly prohibited inside the campus. Each department has prescribed uniforms for the labs. The students are requested to strictly adhere to the dress codes as well as the rules and regulations of the college.

Maintenance of Discipline

Discipline is an important factor that shapes one's personality. It is considered as a golden key capable of opening many doors. This institution expects each and every student to follow the rules and regulations in total. Maintaining discipline in the campus will promote a conductive environment for studies. (Worthise hours)

	Working hours	
Ihour	08.45 a.m. to	09.35 a.m.
II hour	09.35 a.m. to	10.25 a.m
III hour	10.25 a.m. to	11.15a.m
Break	11.15 am to	11.30 a.m
IVhor	11.30 a.m. to	12.20 p.m
Vhour	12.20p.m to	01.10p.m
Vilour	01.50 p.m to	02.40 p.m
Vilhour	02.40 p.m to	03.30p.m
VIII hour	03.30 p.m to	04 20 m m



About Autonomous

Sri Manakula Vinayagar Engineering College has been conferred with Antonomous Status by the University Grants Commission on 26° September 2019 and the same was approved by Pondicherry University on 19° June 2020. SMVEC Autonomous Regulations R2019, is followed for the students admitted in the Academic Year 2019-20 (present final Year). SMVEC Autonomous Regulations R2020, is followed for the students admitted from the Academic Year 2020-21 onwards (present first year & second year)

HIGHLIGHTS OF SMVEC AUTONOMOUS REGULATIONS 2020

- Industry 4.0 ready curriculum
- Updated towards skill development to create more job opportunities
- Multidisciplinary curriculum
- More entreprenurship opportunities
- IELTS model curriculum/Foreign Langauges learning opportunities
- Department wise Gold Medals
- Results will be declared within a month after completion of examinations

Ethnotech/Mandatory course

The Institute has Established 17 Center of Excellence to provide 91 International Cartification courses from IBM, Google, Cisco, E Plan, Microsoft, Autodesk, Texas instruments, Festo, Bentley, Schneider Electric, Amazon web services, Siemens, Tally, DELL EMC, Harita Techsers, PTC, LN an Excellence in Technology & Didactic solutions. All students should earoll in one of the cartification course in every semester

Industrial Training / Internship

Students may undergo training or interschip during summer / winter vacation at Industry/ Research organization, students are also permitted to undergo interachips during their eighth semester after the theory classes are over

September 2022

Date	Day	Schedule	Working day/		
			Holiday		
1	Thu		76		
2	Fri		77		
3	Sat		78		
4	Sun		Holiday		
5	Mon	Teacher's Day	79		
6	Tue		80		
7	Wed		81		
8	Thu	Model practicals			
9	Fri	World E-vehicle Day			
10	Sat				
11	Sun		Holiday		
12	Mon				
13	Tue				
14	Wed	Tentative End Semester Practicals			
15	Thu	Engineer's Day			
16	Fri	World Ozone Day			
17	Sat		Holiday		
18	Sun		Holiday		
19	Mon				
20	Tue				
21	Wed				
22	Thu	Electrical Motors Day			
23	Fri				
24	Sat				
25	Sun		Holiday		
26	Mon				
27	Tue				
28	Wed				
29	Thu	Tentative End Semester Theory			
30	Fri				
		Total number of working days : 06			
		Total number of holiday : 01			
g Gaug	தீ வெற்றியடையைத் உள்ளைத் தனீர, வேறு மாராலும் தடுக்க மரமாறு ^ ப்ரெய்				

August 2022

			_		
Date	Day	Schedule	Working day Holiday		
1	Mon	Certification course - Testing of DC machines	53		
2	Tue		54		
3	Wed		55		
4	Thu		56		
5	Fri	Guest Lecture - Electric Machines in Industries	57		
6	Sat	Special scaphing slass / GP / Seminar / GL / Placement / Academic Aubrities	58		
7	Sun		Holiday		
8	Mon	Certification course - Testing of transformers	59		
9	Tue	Moharam	Holiday		
10	Wed		60		
11	Thu		61		
12	Fri	Feedback from the students - 3	62		
13	Sat	Special cost ingolass (GP) Seminar (GL) Pacementi Academia Adivitas (GCSA) Submission	63		
14	Sun		Holiday		
15	Mon	Independance Day	Holiday		
16	Tue	De Jure Transfer Day	Holiday		
17	Wed	Model Exam starts	64		
18	Thu		65		
19	Fri		66		
20	Sat	National Renewable Energy Day	67		
21	Sun		Holiday		
22	Mon		68		
23	Tue	Model Exam ends	69		
24	Wed		70		
25	Thu		71		
26	Fri		72		
27	Sat	Guest Lecture - Emerging controller	73		
28	Sun		Holiday		
29	Mon		74		
30	Tue		75		
31	Wed	Vinayagar Chathurthi	Holiday		
Total number of working days : 23 Total number of holiday : 08					
	i Card	லி கல்வாக காய்ப்பேம் உள்ள அமக்கைப் ப	i i Baarta		

சலித்தும் கொல்பவன் தவ்வொரு வாய்ப்பலும் உன்ன ஆபத்தைப் பார்ம்றோன். சாறிப்பவன் தவ்வதை ஆபத்திலும் உன்ன வாய்ப்பலைப் பார்ம்தொன்.

SRIMANAKULAVINAYAGAR ENGINEERING COLLEGE VISION

To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society.

MISSION

- M1: Quality Education: To provide comprehensive academic system that amaigamates the cutting edge technologies with best practices.
- M2: Research and Innovation: To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.

M3: Employability and Entrepreneurship: To incuicate the employability and entrepreneurial skills through value and skill based training.

M4: Ethioal Values: To instil deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING VISION

To promote proficiency in the field of Electrical and Electronics Engineering by creating a stimulating environment for research, innovation and

entrepreneurship.

MISSION

M1: Guality Education: To impart high quality technical education with problem solving capabilities by innovative pedagogy in emerging technologies.

M2: industrial and Societal needs: To cater the dynamic needs of the industry and society by strengthening industry-institute interaction.

M3: Research and innovation: To nurture the spirit of research attitude by carrying out innovative technologies pragmatically.

M4: Placement and Entrepreneurship: To incuicate the professionalism in career by advancing synergetic skills to compete in the corporate world.

July 2022

PEO1: Professional Knowledge To possess strong educational foundation in Electrical and Electronics Engineering to attain successful career with professional responsibility
PEO2: Innovative Skills
To enrich the skills to design and develop innovative solutions for engineering problems in a multidisciplinary environment
PEO3: Ethios
To actively embrace leadership qualities for achieving professional goals with ethical values
PEO4: Adaptability
To enhance intellectual competency along with technical skills by

PROGRAMME EDUCATIONALOBJECTIVES (PEO:)

adapting to the current trends through eternal learning

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Core Proficiency

Utilize the engineering core knowledge to identify, formulate, design, and investigate the complex engineering problems of power electronics, electrical machines and power systems.

PSO2: Cutting Edge Technologies

Explore the new cutting edge technologies in the field of Electric vehicle, Automation, Artificial Intelligence, Robotics and Renewable Energy to compete in global market.

PSO3: Decion and Evolution

Capability to comprehend the technological advancements with the usage of modern design tools for analysing and designing systems to contront the rapid pace of industrial innovations.

Date Schedule orking day Day Fri Sat 28 Certification course - Testing of electronic devices Sun oliday 3 4 Mon 30 5 Tue 31 6 Wed 32 7 Thu 33 8 Fri Feedback from the students - 2 34 9 Sat Special ma oling data (P) Seninar (L) Paceneti Ac and south the 35 10 Sun National tesla day - A day of science around the world olidav Mon CAT-I 36 11 12 13 Tue 37 Wed 38 14 Thu 39 15 Guest Lecture - Electric Vehicles Fri 40 16 Sat Holiday Sun 17 Holiday 18 Mon 41 19 The 42 wea 43 20 21 Thu Guest Lecture - Battery management system 22 Fri 23 Sat tyskil koshing kiss /0F1 tenihari 0L / Rowned / Acatenic Advitisc 44 45 46 24 Sun Holiday 25 Mon 47 26 48 Tue 27 Wed 49 28 Thu 50 29 Frl Industrial Visit 51 30 Sat Industrial Visit 52 31 Sun Holiday Total number of working days : 26 Total number of holiday : 08

வெற்றி என்பது, கட்சியத்தைப் படிப்படியாகப் புரித்து கொள்வது ^ தைட்டிக்கிகல்

June 2022

Date	Day	Schedule	Working day Holiday
1	Wed		5
2	Thu		6
3	Fri		7
4	Sat	Special scatching place / GP / Seminar / GL / Placement / Academic Activities	8
5	Sun		Holiday
6	Mon		9
7	Tue		10
8	Wed		11
9	Thu		12
10	Fri		Holiday
11	Sat		Holiday
12	Sun		Holiday
13	Mon		13
14	Tue	Blood Donation Day	14
15	Wed	National Electricity Day	15
16	Thu	Feedback from the students - 1	16
17	Fri	QCM 1 submission	17
18	Sat		Holiday
19	Sun		Holiday
20	Mon	CAT-I	18
21	Tue	International Yoga Day	19
22	Wed		20
23	Thu		21
24	Fri		22
25	Sat	Industrial Visit	23
26	Sun		Holiday
27	Mon		24
28	Tue		25
29	Wed		26
30	Thu		27
		Total number of working days : 23 Total number of holiday : 07	I
1000		notal number of nonday . 07	a de la como

PROGRAMME 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 undestanding of the limitations.
PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural insues 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 environmential 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.
P010: 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.

P012: 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 charge.

U20BST215 ENGINEERING MATHEMATICS - II MULTIPLE INTEGRALS AND

TRANSFORMS Course Outcomes:After completion of the course, the students will be able to CO1 -Understand the concept of double and triple integrals. (K2) CO2 - Apply Laplace transform and inverse Laplace transform of simple functions. (K3) CO3 -Convert a periodic function into series form. (K3) CO4 -Compute Fourier transforms of various functions. (K3) CO5 -Solve difference equations using Z – transforms. (K3)

U20EST238 BASIC ENGINEERING SCIENCE FOR ELECTRICAL ENGINEERING

Course Outcomes: After completion of the course, the students will be able to CO1 -tehnity, analyze the properties and applications of magnetic and detectric materials. (K2) CO2 -List the properties and applications of modern engineering materials. (K1) CO3 - Appreciate concepts of conservation of mass, conservation of energy, and the

Laws of thermodynamics. (K2) CO4-Understand the construction and functioning of IC engines, refrigeration system. (K2) CO6 - Attain knowledge about types of pumps and turbines. (K2)

COS - Analyze the resonance and tuned circuits for series and parallel connections. (K4)
 COS - Analyze the resonance and tuned circuits for series and parallel connections. (K4)

ELECTRICAL MACHINES-I U20EET204

Course Outcomes:After completion of the course, the students will be able to CO1-Analyze the performance of DC machines under various operating conditions using their characteristics. (K4)

their characteristics. (K4)
CO2-Interpret the efficiency of DC machines by conducting Suitable tests. (K4)
CO3-Inspect the performance of single phase transformers using phasor diagrams and
equivalent circuts and understand the characteristics of special transformers. (K4)
CO4-Outine the different types of connections in three phase transformers and savings of
copper in autotransformers. (K2)
CO5-Interpret the efficiency of Transformers by conducting Suitable tests. (K4)
U20EET205
ELECTRONIC CIRCUITS
Course OutcomessAfter completion of the course, the students will be able to
C01 - Design cascade amplifiers and sweep circuits. (K3)
CO3-Evaluate the performance analysis of large signal ampelfer. (K4)
CO4-Design the feedback amplifiers and analyze frequency response. (K3)
LO9EET205
Design oscilators for different types of signal generation. (K3)
LO9EET205
Design cascade Course Design Suitable Suitable

U20EET206 DIGITAL ELECTRONICS

Course Outcomes:After completion of the course, the students will be able to COL-Use the Boolean laws to simplify the logical functions. (K3) CO2-Design 'n' bit counters and shift registers. (K4)

Important points for the kind attention of the Parents

Dear Pare

The II semester classes commences on 27th May 2022. The above The 11 semester claster commences on 21% May 2022. The show mentioned semester is a very short term, including working days meant for model exam. The student have to complete a lot of work within a short period. Hence the parents are kindly requested not to permit their wards to avail frequent leave during this semester period for the following reasons.

 Π semester (IYear) : All the Π semester papers are considered as analytical papers. Hence, regular attendance and more concentration are required to clear these semester papers.

Marks in the continuous assessment test decide the major part of the continuous assessment marks. So, availing leave for the continuous assessment test must be avoided at any cost as this would seriously affect the continuous assessment marks

Practicals are very important not only to score more marks but also it will help to understand the theory part of the subject, hence advice your ward not to avail leaves during practical classes.

Please spare your valuable time to talk to your sou/daughter every day and try to understand what he'she is doing in respect of his/her studies. Kindly extend all your support to your son/daughter which will help them to come out successfully. For any assistance from our side you may always feel free to contact the respective Coordinator / HOD any time during the working hours.

		May 2022			
Date	Day	Schedule	Working day Holiday		
1	Sun		Holiday		
2	Mon				
3	Tue	Ramzan	Holiday		
4	Wed				
5	Thu				
6	Fri				
7	Sat				
8	Sun		Holiday		
9	Mon				
10	Tue				
11	Wed				
12	Thu				
13	Fri				
14	Sat				
15	Sun		Holiday		
16	Mon				
17	Tue				
18	Wed				
19	Thu				
20	Fri				
21	Sat				
22	Sun		Hollday		
23	Mon				
24	Tue				
25	Wed				
26	Thu				
27	Fri	Commencement of II semester classes	1		
28	Sat		2		
29	Sun		Holiday		
30	Mon		3		
31	Tue		4		
Total number of working days : 04 Total number of holiday : 01					

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நீ வெற்றியடையதை உள்ளைத் தமிர, வேறு பாராலும் தடுக்க அடியாறு உப்பெய்

CO3 - Design and analyze the synchronous and asynchronous sequential circuits. (K4) CO4 - Gain knowledge on the design and fabrications of semiconductor memories. (K2) CO5 Design, debug and test digital logic circuits using VHDL. (K4)

U20EEP203 ELECTRIC CIRCUIT ANALYSIS LAB

Course Outcomes:After completion of the course, the students will be able to CO1- Verify the basic laws and simplify more completed circuits into simple equivalent circuits using network theorems to compute various parameters of typical DC and AC electrical circuits. (K4) CO2- Evaluate the solution of three phase AC balanced and unbalanced circuits with

rent types of loads. (K4) 116

CO3-Analyse of house, from CO3-Analyse of house response of RL, RC and RLC circuits with DC and AC input used in power converters, choppers and sweep circuits. (K4) CO4-Design tuned circuit for given frequency used in radio amplifiers for frequency tuning.

(K5) COS- Make use of simulation software for simulating various electrical circuits. (K5)

U20EEP204 ELECTRICAL MACHINES LAB - I

Course Outcomes: After completion of the course, the students will be able to

CO1-Test the performance of any DC machine (shurt, series or compound) and transformer by conducting suitable experiments and report the results. (K6) CO2- Predetermine the different performance characteristics of DC machines and transformers. (K6)

CO3-Experiment and analyze the various speed control techniques for DC motors. (K8) CO4-Experiment the parallel operation and analyze the load sharing of single phase

transformers. (K4)

CO5-Develop any prototype modules implementing different control techniques in DC machine and transformers for various applications. (K5)

U2EEP206 ELECTRONICS LAB - II Course Outcomes: After completion of the course, the students will CO1 - Design excitator excitos for different types of signal generation CO2 - Design and verify the contrastional circuits using K-Map. (K3) CO4 - Design and verify the different sequential circuits. (K4) CO5 - Design and verify the different sequential circuits. (K3) CO6 - Design and verify counters, shift registers and display devices e, the students will be able to ration. (K3)

UZDEES201 SKILL DEVELOPMENT COURSE 1: DEMONSTRATION OF BASIC ENGINEERING SCIENCE Course Outcomes: After completion of the course, the students will be able to CO1 - Datinguish between tools of various trades such as carpertry, fitting, sheet metal, welding, and foundry(H2) CO2-Describethe used of carpentry and fitting joints such as lap, but, mortise joint, various sheet metal modelsand casting processes. (H2) CO3 - Bacity on hand tools used in carpentry and preparation. (K4) CO4 - Apply on hand tools used in carpentry and preparation. (K4) CO5 - Analyze of machine tools used in sheet metal work and fabrication work. (K5)

Supplementary Examinations

Supplementary examination is an additional examination conducted within a month of time after declaring the results of and semester examination. In order to complete the program within 4 years, only the student with maximum of two arrears will be permitted to appear for supplementary examination. The supplementary examination will be conducted in fifth and eighth semester only. For supplementary examination, the continuous assessment marks of the last attempt will be considered.

Benefits

- A More number of students will receive the degree within the stipulated time
- The industries prefers to recruit students with no standing arrear. If the supplementary examinations is conducted then more number of students will be eligible for the recruitment

Photo copy of answer book

After the publication of the result, photocopy of the answer books shall be provided to the student on request with stipulated fee fixed by the College from time to time [Purchas]in in Attendance] **Punctuality in Attendance**

The students are requested to keep up punctuality in attending the college. The inte comers will be looing their attendance and in turn the internal marks. Hence all the students are requested to attend the college in time. A student thall be permitted to appear for the End Semester Examination at the end of the semester only if he/ she secures not less than 75% of overall attendance.

Redo Category

A student who secures overall attendance which is less than 60% has to repeat the course with the approval, when it is next offered.

Tutor Ward System

In the tutor ward system, 30 students are allotted to a tutor who will be taking care of these students. The students are requested to utilize the facility.

	Gold Medals and Top Ten Ranks					
	Your seniors were sincere, hard working and got the Gold medals of the Pondicherry University and the top ten ranks in all the branches. The details of the University					
		n all the branches. The d nks won by the studen				
	-	nd University First Rank	-			
		s for each branch of study, th				
		d and it is mandatory that				
		enester in the first stlempt.	Rank certificates would be			
	e first five candidates in ea	ch branch of study. Year)			
Name of the Course	2017	2018	2019			
Bligh EEE	2.4.6.7	<u> </u>	23,467,89,10			
Black ECE	2245678010	π	<u>A</u>			
Blach BCE	2,3,4,5,6,7,8,9,10		\$,3,4,5,6,7,9,10			
Blich CSE	2, 3, 4, 10		2,4,6,7,8,10			
Blich II	? ,2,3,4,5,6,7,8,9,10	The second se	2,3,5,6,8			
BTach KE	2,3,4,5,6,7,8,9,10	*	2,3,4,5,6,7,8,9,10			
BTach Made	4, 5, 7, 9, 10		3,7,8,10			
BTach Civil	2, 3, 10		2,3,4,6,7,10			
MCA	3,4,7,9,10	<u>®</u>	267,89,10,11			
MBA	3,4,6,7,8		23,4,5,7,8,10			
Millah CSE	😤 2, 3, 4, 5, 7, 8, 9		R 7			
Millach ECE	2, 3, 6, 7, 8, 9		23,45			
Millah PED	R		R 23			
MTMh NW	2, 3, 4, 5, 7, 8, 9		23			
MTath(VLSI)	*		9 ,2,3,4			
MTash(MF)	% .2		8			

Placement and Training Division						
The placeme	nt cell fin	actions round the clock	thro	ughout the year to est	ablish	
contact with	reputed	multinational compani	es, 1	well established indu	strial	
organizations and plays an important role in locating various job opportunities and						
placing large	number o	f the students every year:	аtњ	ese organizations.		
		Activities of the Training	Div	ision		
 Агтандес 	trainings	for personality and interp	arson	ial skill development.		
		to get in plant training			I	
 Arranges 					I	
 Creates at Arranges 	coaching o	in the opportunities open classes for GATE, GRE, T(FE	L, IELTS, IAS, IES etc.		
Placemen	tRecord	Details of Pla	aced	Students: 2021-22		
Academic	Students	MST Robar Services	18	Microchip	3	
Year	Placed	VL and Engg. & Const		TCS-Digital	9	
2013-14	85%	2080		KAAR	22	
2014-15	97%	TCS - Ninia		Virtusa	17	
2014-15	90%	CTS-Genc		EmbedUK		
2015-16	95%	Wipro	147	AMI		
2016-17	93%	MuSigma	31	NTT Data	4	
		Harrown		Excelacom	3	
2017-18	95%	CIS Gene Elevate	15	Support Studio Tech	- 5	
2018-19	95%	Econ	1	Secure Kloud	10	
2019-20	97%	Mindtree	27	CETAS	4	
		Oala	1	Tech Mahendra	10	
2020-21	96%	MicroChip Technologies		Forbos Marshall	2	
2021-22	90%	Capgemini	14	RKPower Gen Pot.	2	
		HCL Technology	- 5	Rampal Pvt. Ltd	2	
		Infosys	14	Adroit Soft	33	
		India Nippon Electrical	1	Unisys	11	
		Eaton		Skolar Academy	11	
		My Medical Shop	3	others	59	
		Voltech	16			
		Appasanty Associates	2	Total	*897	
Wi-Fi Campus * till May 2022						
Our campus has been enabled by high speed uninterrupted Wi-Fi connectivity.						
The Compute	r Centre i	s open till 8.00 p.m. on a	ll the	working days except (on the	
dates of Univ	ersityexa	minations.				
	-	Library Working H	low			
8.30	a.m. to 8.3	30 p.m. (On all the working	g day	5)	I	
8.30	a.m. to 10	00 p.m. (During the exam	inati	an days)	I	
		s.50 am to 1000 pm (Duning the walling the walling the walling				

Marks Distribution of Continuous Assessment Marks (CAM) and End Semester Examination Marks (ESM)

	Scheme for Continuous Assessment Test(CAT)										
			Continues Assessment components								
S. No	Сонгзе Туре	Test Marks	Average of pre/post test/ viva for cach experiment	Average of interfactor appending app	Model Exam / Report	Assignment	Review-1	Review-2	Review-3	Attendance	Total
1	Theory	15	-	-	-	5	-	-	-	5	25
2	Practical	-	10	15	15	-	-	-	-	10	50
3	Project work	-	-	-	-	-	10	10	20	-	40
The	internal marl	cs wi	ll be provi	ded fully be	used o	on the	e con	tiouc	aus as	seas	ment

tests

	Weightage of Assessment for Theory Course					
S.No.	Test	Portion for Test	Test Marks	Duration of Test	Weightage for Internal	
1	CAT 1	1% Units	50	1 % hours		
2	CAT2	1% Units	50	1 % hours	10	
3	Model	5 Units	75	3 hours	05	
	Continuous Assessment for Theory Course 15					

estion Paper Pattern		

Question Paper Pattern Question paper for CAT and ESE will be based on the patterns shown in Table (a) and (b) Table (a) Constition Paper pattern for CAT/Model Exam

Tal	Table (a) Question Paper pattern for CAT/Model Exam					
Test Type	2 Marks	5 Marks	5 Marks 10 Marks			
CAT 1 to 2	5(questions) (10 Marks)	4(questions) (20 Marks)) 2 (questions) (20 Marks)	50		
Model	End sens	ester Examina	tion Question	75		
		Pattern	_			
Table (b) (Question paper p	attern for End	semester Examina	ation(ESE)		
2 Marks	5 Marks 10 Marks			Total Marks		
10(20 Marks)	5 (25 Marks) (one questions from each unit)		3 (30 Marks) (out of 5 questions)	75		

Distribution of Attendance marks for theory : 5 marks

The distribution of 5 marks for theory class attendance is as follows : 5 marks for 95% attendance and above 4 marks for 90% attendance and above but below 95% 5 marks for 55% attendance and above but below 90% 2 marks for 80% attendance and above but below 85%

1 mark for 75% attendance and above but below 80%

Distribution of Attendance marks for practical : 10 marks

The distribution of 10 marks for practical class attendance is as follows : 10 marks for 95% attendance and above 8 marks for 90% attendance and above but below 95% 6 marks for 5% attendance and above but below 90% 4 marks for 80% attendance and above but below 85% 2 marks for 75% attendance and above but below 80%

Note :

Students should not be absent for the online classes/regular classes. Attendance for the online classes/regular classes are monitored regularly and it is recorded. Continuous assessment mark will be based on the performance of the students in the continuous assessment test, cent and attendance percentage. assignin

Assignments : 5 marks

Out of 25 continuous assessment marks, 5 marks will be awarded for the assignment. The assignment questions will be different for each and every student. The students have to submit 3 assignments in each subject. Best of 2 out of 3 assignments will be consider.

Women Cell

For the banefit of the girl students, a Woman Cell has been constituted in the college. The girl students may approach the Chairperson / members for assistance.

Grievance Redressal Cell

There is a Grievance Redressal Cell under the Chairmanship of the Director of the institution. Students are requested to approach the Chairman / members to redress their grievances. Mail D: grievance@mvwc.ac.in

Importance of Continuous Assessment Marks(CAM)

The continuous assessment marks once earned are carried over to the subseque exams also. Hence the students are requested to work hard to get the maximu continuous assessment marks. If the continuous assessment marks are lower, it w pull down chances of getting the first class, distinction, gold medals and ranks. wr, it will

Importance of CAT-I/CAT-II/Model Examination

Continuous assessment marks are availed fir the performance in the CAT-II & Model Exam, Hance all the students are requested to prepare well for each test / examination to earn the maximum continuous assessment marks.

Undertaking Minor / Major Projects

Each student is advised to take atleast one minor project. Involving in the project will be halping to understand the basics of the subject. Some of the minor / major project will also be benefiting the society. Moreover, the Management awards cash prizes for the best projects in each department.

Participation in the Curricular / Co-curricular / Extra curricular Activities

All the students are encouraged to participate in the curricular / co-curricular / extra curricular activities. Involvement in these activities will improve their knowledge level in the subject. If a student or a team gets cash prize / award in the technical event organised by the recognised institutions, then the management of this institution will also succion an amount equivalent to the winning award / cash prize a tables of immediates. as a token of appreciation.

Leave Account Record

For each student, leave account record has been provided. The students are instructed to show the leave record to their parents and strictly adhere to the instructions given for availing the leave. The leave account record should be maintained properly and prior approval must be obtained for availing the leave. In exceptional case, the students are permitted to get the approval after availing the leave.

Transport Facility

(Francpert Facing) of buses have been arranged for the students to reach the college from Pudncherry, Kanagachettikulam, Ullupuram, Neyveli, Panruti, Cuddalore, Nellikuppam, Madakarai, Tindivanam, Tiruramanalai and tirudhachalam covering almost all the college after 5 pm for reliking computer lab, library and sports facility its who remain in the college after 5 pm for reliking computer lab, library and sports facilities. The students are requested to utilise the transport facility. All the students are requested to avoid mobile phones and travel by two wheelers considering their safety and security.

ANNEXURE - 3



SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE (An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University) (Accredited by NBA-AICTE, New Delhi, Accredited by NAAC with "A" Grade) Madagadipet, Puducherry - 605 107



DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

LIST OF STUDENTS AND FACULTIES REGISTERED FOR NPTEL/MOOC COURSES FOR ACADEMIC YEAR 2022-2023

PERIOD	DEPARTMENT	FACULTIES	STUDENTS
JULY-OCT 2022	EEE	11	110
Total Enro	12	1	



DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

List of faculty enrolled for NPTEL exam for July – October 2022

S.No	Name	Designation	Name of the course registered
1	Dr.P.Jamuna	Professor	
2	Dr.D.Raja	Professor	
3	Dr.K.Gowrishankar	Professor	
4	Dr.G.GaneshKumaran	Associate Professor	
5	Dr.M.Jayachandran	Assistant Professor	Solar Energy Engineering and Technology
6	Dr.D.Sivaraj	Assistant Professor	[12 Weeks]
7	Mr.K.Thangaraj	Assistant Professor	
8	Mr.J.Muruganandam	Assistant Professor	-
9	Mr.C.Adrien Perianayagam	Assistant Professor	
10	Mr.R.Ragupathy	Assistant Professor	
11	Mr.I.Shivashankar	Assistant Professor	



SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE (An Autonomous Institution)

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

List of students enrolled for NPTEL/MOOC Courses July – October 2022

Sl. No.	Name of the certification course	NPTEL/ Edx / Coursera, etc
1.	Fundamentals of Electrical Engineering	NPTEL
2.	Analog Circuits	NPTEL
3.	Microprocessor And Microcontrollers	NPTEL
4.	Power System Engineering	NPTEL
5.	Fuzzy Sets, Logic and Systems & Applications	NPTEL
6.	Data Science for Engineers	NPTEL
7.	Product Design and Development	NPTEL
8.	AI For Everyone: Master the Basics	EDX
9.	Business Consideration for Edge Computing	EDX
10.	Introduction to Cloud Development with HTML,CSS and Java Script	EDX
11.	Electric Cars: Technology	EDX
12.	Understanding Nuclear Energy	EDX
13.	Introduction to Cloud Computing	EDX
14.	Deep learning Fundamentals with Keras	EDX
15.	Python Basics For Data Science	EDX

16. Migrating to the AWS Cloud	EDX
17. Getting Started with Cloud Security	EDX
18. Product management: Fundamentals	EDX
19. Amazon Sage Maker: Simplifying machine Learning Application Development	EDX
20. Introduction to Linux	EDX
21. Introduction to Kubernetes	EDX
22. Solar Energy	EDX
23. Introduction to Data Science	EDX
24. Python Fundamentals for Beginners	Great Learning
25. Multilayer Perceptron	Great Learning
26. Introduction to Deep Learning	Great Learning
27. Introduction to Digital Marketing	Great Learning
28. Probability for Data Science	Great Learning
29. Introduction to Cyber Security	Great Learning
30. AWS Mobile App Development	Great Learning
31. Basics of Machine learning	Great Learning
32. Python Project Ideas	Great Learning
33. Types of Cyber Security	Great Learning
34. Probability	Great Learning
35. Introduction to R	Great Learning
36. Introduction to Machine Learning	Great Learning
37. Python for Machine Learning	Great Learning
38. Firewall	Great Learning
39. Java Programming	Great Learning

Page | 63

		-
40.	Data Visualization using Python	Great Learning
41.	Data Visualization Using Tableau	Great Learning
42.	Statistical methods for decision making	Great Learning
43.	Marketing & Retail analytics – Advanced	Great Learning
44.	Data Science Foundations	Great Learning
45.	Logistic Regression	Great Learning
46.	Instagram marketing fundamentals	Great Learning
47.	Basics of Managing Money	TRAININDIA
48.	Learn the Art of Hacking Through Programming	NIIT
49.	C Course	SoloLearn
50.	Beginner to Advanced WordPress Course	Just Web Infotech
51.	Maven Crash Course	Udemy
50.	Beginner to Advanced WordPress Course	Just Web Infotech

Annexure – IV

List of Examiners

SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE



(An Autonomous Institution) (Approved by AICTE, New Delhi & Affiliated to Pondicherry University) (Accredited by NBA-AICTE, New Delhi, Accredited by NAAC with "A" Grade) Madagadipet, Puducherry - 605 107



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

DETAILS OF EXAMINER

Specialization		Power Electronics and Drive	s	
S.N o	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
1.	Dr.J.Ramesh Rahul	Assistant Professor / EEE, National institute of Technology, Andhra Pradesh	7989923036	rahuljammy1925@gmail.com
2.	Dr.K.K.Saravanan	Assistant Professor / EEE, University College of Engineering, Thirukuvalai campus, Nagapattinam	9789695832	saravanan.santi@gmail.com
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6.	Dr.V.Krishna kumar	Associate Professor / EEE, St.Joseph's college of Engineering, Chennai	9944235196	v.krishnakumarsjce@gmail.co m
7.	Dr.R.Raja Singh	Associate Professor / Department of Energy and Power Electronics, VIT, Vellore.	9894250650	rrajasingh@vit.ac.in
8.	Dr.C. Kumar	Professor and Head / EEE M Kumarasamy College of Engineering Thalavapalayam Post, Karur Tk,	9994942022	kumarc@bitsathy.ac.in
9.	Dr.Srinivasan Pradabane	Assistant Professor / EEE, National institute of Technology, Warangal, Telegana	8639352033	spradabane@nitw.ac.in
10.	Dr.P.Velmurugan	Associate Professor / EEE, St.Joseph's College of Engineering, Chennai	9976949243	velupriya10@gmail.com

11.	Dr.N.Shobanadevi	Professor , University College of Engineering, Ariyalur.	8778149535	shobanadevi1975@gmail.com
12.	Dr.D.Zamrooth	Asst.Professor, Department of EEE, University college of Engineering, Kanchipuram	9176773605	zam.shireen@gmail.com
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14.	Dr.S.Prabhu	Associate Professor, Department of EEE, SreeVidyanikethan Engineering College, SreeSainath Nagar, Tirupati.	9600646211	prabhutajmahal6@gmail.com
15.	Dr.R.Natarajan	Associate Professor / EEE Fatima Michael College of Engineering and Technology, Madurai	9655986026	natarajanrajavel369@gmail.co m
16.	Mr.C.Nandakumar	Assistant Professor / EEE Arunai Engineering College, Velu Nagar, Mathur, Tiruvannamalai	9865714571	nandha30electra@gmail.com
17.	Dr.PadmajaSankal a	Asst. Professor / EEE, All India Shri Shivaji memorial Society's College of Engineeirng,Pune	9923669024	pksankala@aissmscoe.com
18.	Dr.S.Priyadharash ni,	Assistant Professor / EEE, Arunai Engineering College, Velu Nagar, Mathur, Tiruvannamalai, Tamilnadu.	9994576791	priyamshanmugam@gmail.co m
19.	Dr.R.Thamaraiselv i	Assistant Professor/EEE, University College of Engineering, Villupuram	9487363388	r.thamaraiselvi1@gmail.com
20.	Dr.R.Murugesan	Asst. Professor, Department of EEE, Annamacharya Institute of Technology and Sciences Thirupati	9944228455	rmurugesandr@gmail.com
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		of Technology, Kalitheerthalkuppam,		
		Puducherry.		
25.	Mr.M.Saravanaku mar	Assistant Professor / EEE, Mailam Engineering College, Mailam	9786863566	saravanakumareee@mailame ngg.com
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30.	Dr.G.Madhusudan an	Professor / EEE, SRM Nagar, Kattankulathur, Chengalpattu.	9884413903	madhusudanang.eee@valliam mai.co.in
31.	Dr.G.Haridoss	Associate Professor/EEE, M. A. M College of Engineering and Technology, Siruganur, Trichy	9865481065	haridossg@gmail.com
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33.	Dr.K.Arul Kumar	Assistant Professor / EEE, Madanapalle Institute of Technology & Science, Madanapalle- Chittoor District, Andhra Pradesh	9994822651	karuleee@gmail.com
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36.	Dr.T Suresh Padmanabhan	Associate Professor, Department of ECE, E.G.S Pillay Engineering College, Nagapattinam.	9444025552	drtsp@egspec.org
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39. Dr.R.Murugesan Assistant Professor / EEE, Annamacharya Institute of Technology and Sciences, Tirupati	9944228455	rmurugesandr@gmail.com
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Spec	ialization	Power systems		
S.N o	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
1.	Dr.N.Chidambarar aj	Associate Professor / EEE, St.Joseph's College of Engineering, OMR, Chennai	9840826431	chidambararajn@stjosephs.a c.in
2.	Dr.A.Ragavendira n	Asst.Professor / EEE, AVC College of Engineering, Mannampandal Mayiladudurai	8248781797	ragavendiran.as@gmail.com
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13.	Dr.P.Ajay.D.Vimal Raj	Associate Professor Department of EEE, Pondicherry Engineering College.	9486142839	ajayvimal@pec.edu
14.	Ms.V.Logeshwari	Assistant Professor Department of EEE, Government College of Engineering, Srirangam.	8778727201	logulagam@gmail.com
15.	Dr. S. A.Elankurisil	Professor and Head/ EEE Adhiprasakthi Engineering College, Melmaruvathur,	9442936797	saelankurisil@gmail.com

Spec	ialization	Electrical Drives and Control		
S.N o	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
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3	Dr.V.Krishnakumar	Associate Professor / EEE St.Joseph college of Engineering Chennai.	9944235136	v.krishnakumarjce@gmail.c om
4	Dr.D.Lenine	Professor/EEE R.G.M College of Engg. & Tech. Nandyal, Andhra Pradesh.	9866723784	lenine.eee@gmail.com
5.	Dr.C.Carunaiselvan e	Assistant Professor, Department of Automobile Engineering SRM Institute of Science and Technology, KTR Campus, Chennai	8265804594	carunaic@srmist.edu.in

Specialization		Electrical Engineering		
S.N o	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
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Specialization		Image Processing		
S.N o	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
1	Dr. S. Karthick	Associate Professor / EEE, Sengunthar Engineering College, Thudupathi Post, Perundurai, Erode	9486937253	resumekarthick@gmail.com

Specialization Very Large Scale Integration		n		
S.N o	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
1	Dr.T.Venishkunmar	Associate Professor / EEE, Sethu Institute of Technology, Pulloor, Kariapatti – Virudhunagar, Tamilnadu	9095577477	tvenishkumar@gmail.com

Specialization		Control System and Instrumentation		
S.N o	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
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4	Mr.P.Jekan	Assistant Professor / EEE, SRM University, Kattankulathur, Chengalpattu.	9884937734	jeganp@srmist.edu.in

Speci	alization	Applied Electronics		
S.N o	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
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Specialization		Automotive Technology, Material Science		
S.N o	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
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