



**SRI MANAKULA VINAYAGAR**  
**ENGINEERING COLLEGE**  
(An Autonomous Institution)

**Department of Electrical and Electronics Engineering**

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**Minutes of 4<sup>th</sup> Meeting of BoS (UG)**

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**Venue** : Seminar Hall,  
Department of EEE,  
Sri Manakula Vinayagar Engineering College

**Date & Time** : 22<sup>nd</sup> February, 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, ISO 9001:2000 Certified Institution &  
Accredited by NAAC with 'A' Grade)

Madagadipet, Puducherry - 605 107



## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### Minutes of 4<sup>th</sup> Meeting of Board of Studies (UG)

The Fourth meeting of Board of Studies in Electrical and Electronics Engineering Department was held on 22<sup>nd</sup> February 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

| Sl. No.  | Name of the Member  | Designation |
|--|---|-------------|
| <b>Head of the Department (Chairman)</b>         |   |             |
| 1  | <b>Dr. S. Anbumalar, M.E., Ph.D.,</b><br>Professor and Head<br>Specialization: Control System<br>Years of Experience: 29 years<br>Sri Manakula Vinayagar Engineering College<br>saravanan.anbumalar@gmail.com<br>9443179533 | Chairman    |
| <b>The entire faculty of each specialization</b> |   |             |
| 2  | <b>Dr. P. Jamuna, M.E., Ph.D.,</b><br>Professor<br>Specialization: Power Electronics and Drives<br>Years of Experience: 16<br>Sri Manakula Vinayagar Engineering College<br>jamuna1981@gmail.com<br>9789544379              | Member      |
| 3  | <b>Dr. D. Raja, M.Tech., Ph.D.,</b><br>Professor<br>Specialization: Electrical Drives and Control<br>Years of Experience: 15<br>Sri Manakula Vinayagar Engineering College<br>rajaapeee@gmail.com<br>9944337970             | Member      |
| 4  | <b>Dr. K. Gowrishankar, M.Tech., Ph.D.,</b><br>Professor<br>Specialization: Instrumentation and control<br>Years of Experience: 16<br>Sri Manakula Vinayagar Engineering College<br>gowri200@yahoo.com<br>909555412         | Member      |
| 5  | <b>Dr. S. Ganesh Kumaran, M.E., Ph.D.,</b><br>Associate Professor<br>Specialization: Electrical Machines<br>Years of Experience: 10<br>Sri Manakula Vinayagar Engineering College<br>ganeshphd4u@gmail.com<br>9677624378    | Member      |

|  |  |                |
|--|--|----------------|
| <b>S&amp;H Faculty</b>   |  | Member         |
| 6  | <b>Dr. T. Gayathri</b><br>Professor, Dept. of Mathematics, SMVEC   | Member         |
| 7  | <b>Dr. K. Kathikeyan</b><br>Associate Professor, Dept. of Chemistry, SMVEC   | Member         |
| 8  | <b>Mrs. G. Namita</b><br>Associate Professor, Dept. of English, SMVEC  | Member         |
| 9  | <b>Dr. P. Jayavardhano</b><br>Associate Professor<br>Dept. of Physics, SMVEC, Madagadipet-605107   | Member         |
| <b>Two subject experts from outside the Parent University nominated by the Academic Council</b>  |  |                |
| 10   | <b>Dr. J. Kanagaraj, M.E., Ph.D.,</b><br>Professor & Head (In charge)<br>Specialization: Control System<br>Years of Experience:22<br>PSG College of Technology (Autonomous)<br>Coimbatore – 641 004.<br>Jkr.eee@psgtech.ac.in<br>94436 54496 | Subject Expert |
| 11   | <b>Dr. P. Lakshmi, M.E., Ph.D.,</b><br>Professor<br>Specialization: Electrical Engineering<br>Years of Experience:20<br>College of Engineering Guindy, Anna University,<br>Chennai. 600 025.<br>p_lakshmi@annauniv.edu<br>9444266117         | Subject Expert |
| <b>One expert nominated by the Vice-Chancellor from a panel of six recommended by the college principal.</b>                               |  |                |
| 12   | <b>Dr. A. Kavitha, M.Tech., Ph.D</b><br>Professor<br>Specialization: Electrical Engineering<br>Years of Experience: 22<br>College of Engineering Guindy, Anna University,<br>Chennai-600025<br>akavitha@annauniv.edu,<br>9444388778          | Subject Expert |
| <b>One representative from industry/corporate sector/allied area relating to placement.</b>  |  |                |
| 13   | <b>Er. S. Selva Kumar, B.Tech.</b><br>Senior Engineer<br>Qualcomm India Private Limited<br>Bengaluru,<br>Karnataka - 560001  | Member         |
| <b>One postgraduate meritorious alumnus nominated by the Chairman, Board of Studies, with the approval of the principal of the college</b> |  |                |
| 14   | <b>Er. K. Ramraj, M.Tech</b><br>Technical Director,<br>Specialization: Power Electronics<br>Years of Experience:8<br>LED FORSE India,<br>Poornankuppam, Puducherry – 605 007.<br>ramraje@ gmail.com,<br>9786714116                           | Member         |

## Agenda of the Meeting

- |                                      |  |
|--------------------------------------|--|
| Agenda 1 /<br>BoS/ 4 /2022 /EEE /UG  | Confirmation of minutes of 3 <sup>rd</sup> meeting of BoS and the Curriculum Structure of B.Tech Electrical and Electronics Engineering of R-2019 and R-2020 Regulations – Modifications if any  |
| Agenda 2 /<br>BoS/ 4 /2022 /EEE /UG  | To discuss modifications in the syllabi of IV year, VII and VIII semesters, under Autonomous Regulations R-2019 for the B.Tech – Electrical and Electronics Engineering students admitted in the Academic Year 2019-20.  |
| Agenda 3 /<br>BoS/ 4 /2022 /EEE /UG  | To discuss modifications in the syllabi of II and III years (IV to VI semester), under Autonomous Regulations R-2020 for the B.Tech – Electrical and Electronics Engineering students admitted from the Academic Year 2020-2021.   |
| Agenda 4 /<br>BoS/ 4 /2022 /EEE /UG  | To discuss and approve the Academic Calendar for odd/even Semester of Academic year 2021-22. The classes commenced from 21.01.2022 in online mode and in offline mode for all the years from 02.02.2022 onwards.   |
| Agenda 5 /<br>BoS/ 4 /2022 /EEE /UG  | To approve the professional and open Elective courses offered to the III year/ VI semester students under R-2019 regulations during the period January 2022 to May 2022.   |
| Agenda 6 /<br>BoS/ 4 /2022 /EEE /UG  | To discuss and approve the on-line SWAYAM/MOOCs courses offered for the III year/ VI semester students under R-2019 regulations during the period January 2022 to May 2022.  |
| Agenda 7 /<br>BoS/ 4 /2022 /EEE /UG  | To discuss and approve the Certification courses offered for the II year and III year students under R-2019 and R-2020 regulations during the period January 2022 to May 2022.   |
| Agenda 8 /<br>BoS/ 4 /2022 /EEE /UG  | To discuss and recommend the panel of examiners to the Academic Council  |
| Agenda 9 /<br>BoS/ 4 /2022 /EEE /UG  | To discuss various Research activities in the department <ul style="list-style-type: none"><li>• Implementation of AICTE-MODROB during the period 2021-2023.</li><li>• Patents Publication and submission</li><li>• Submission of research proposals</li><li>• Journal Paper publications and submission</li></ul> |
| Agenda 10 /<br>BoS/ 4 /2022 /EEE /UG | Any other additional points to be discussed with the permission of 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 /4 /2022 /EEE /UG

Confirmation of minutes of 3<sup>rd</sup> meeting of BoS and the Curriculum Structure of B.Tech Electrical and Electronics Engineering of R-2019 and R-2020 Regulations – Modifications if any.

Chairman, BoS, apprised the minutes of 3<sup>rd</sup> BoS, its implementation and then it is confirmed with the approval in 4<sup>th</sup> BoS meeting.

#### Agenda 2/ BoS /4 /2022 /EEE /UG

To discuss modifications in the syllabi of IV year, VII and VIII semesters, under Autonomous Regulations R-2019 for the B.Tech – Electrical and Electronics Engineering students admitted in the Academic Year 2019-20.

The modifications to be carried out in the syllabi of IV year, VII and VIII semesters (R2019 Regulations) were discussed and the following suggestions are given by BoS members.

| S. No. | Regulations | Semester                  | Course Name with Code                             | Unit | Changes incorporated   |
|--------|-------------|---------------------------|---|------|--|
| 1      | R2019       | VII                       | Industrial Automation and Control<br>U19EET71     | V    | <ul style="list-style-type: none"><li>IoT based experiments are included in the lab course. Hence, Unit V has changed as Introduction to IoT</li></ul>   |
| 2      | R2019       | VII                       | Industrial Automation and Control Lab<br>U19EEP72 | -    | <ul style="list-style-type: none"><li>Two IoT based experiments are included by replacing the SCADA experiments.</li></ul>   |
| 3      | R2019       | VII Professional Elective | Communication Engineering<br>U19EEE71             | II   | <ul style="list-style-type: none"><li>The following topics were additionally present in UNIT-II and they can be removed<ul style="list-style-type: none"><li>OOK Systems, OPSK, QAM, MSK, GMSK</li></ul></li></ul>                                       |
|        |             |                           |   | III  | <ul style="list-style-type: none"><li>The following topics were additionally present in UNIT - III and they can be removed<ul style="list-style-type: none"><li>Source coding: Shaum, Fao, Huffman coding, noiseless coding, theorem</li></ul></li></ul> |
| 4      | R2019       | VII Professional Elective | SMPS and UPS<br>U19EEE75                          | I    | <ul style="list-style-type: none"><li>The topic Cascaded Boost Converters is not required in UNIT- I and it can be removed.</li></ul>  |

The above corrections are incorporated and the Syllabi (Given in Annexure- I) are approved by the BoS members.

#### Agenda 3/ BoS /4 /2022 /EEE /UG

To discuss modifications in the syllabi of II and III years (IV to VI semester), under Autonomous Regulations R-2020 for the B.Tech – Electrical and Electronics Engineering students admitted from the Academic Year 2020-2021.

The modifications to be carried out in the syllabi of II & III years, IV to VI semesters (R2020 Regulations) were discussed and the following suggestions are given by BoS members.

| S. No. | Regulations  | Semester | Course Name with Code  | Unit              | Changes incorporated  |
|--------|--|----------|--|-------------------|---|
| 1      | R2020  | IV       | Measurement and Instrumentation for Electrical Engineering U20EET411 |                   | The content in Measurement and Instrumentation for Electrical Engineering Course is vast and hence, few topics need to be removed as per the suggestions given below.   |
|        |  |          |  | I                 | Systematic and random errors, propagation of errors, Limiting errors of instruments has to be removed.  |
|        |  |          |  | II                | <ul style="list-style-type: none"> <li>Principle of operation, construction, Torque equation, types, testing and Calibration using direct and phantom loading has to be removed.</li> <li>Testing, application of measuring CT and VT has to be removed by retaining Instrument Transformers.</li> </ul>  |
|        |  |          |  | III               | Decibel meters - Q meter - tan-delta meter - Modulation index meter - Sampling theory and its applications in current, voltage, power, energy measurements has to be removed.   |
|        |  |          |  | IV                | <p>The following topics has to be removed</p> <ul style="list-style-type: none"> <li>Owens and Heavy side Campbell bridges</li> <li>De Sauty bridges</li> <li>localization of cable faults by Murray and Varley loop test - Methods of reducing bridge errors - Wagner Earthing Device.</li> <li>Suggested to include Schering Bridge.</li> </ul> |
| V      | <p>The following topics has to be removed</p> <ul style="list-style-type: none"> <li>stroboscope, gyroscope – Force: Strain gauge – Torque: magnetostrictive, Position: synchro-Transmitter and receiver.</li> <li>Pressure: Manometers, Bourdon.</li> </ul> |          |  |                   |   |
| 2      | R2020  | IV       | Microprocessor and Microcontroller U20EET412                         | I, II, III, IV, V | <ul style="list-style-type: none"> <li>Students faced difficulties in understanding both 8-bit and 16-bit processors under R-2019 regulations. Hence, the Units are rearranged only using 8-bit processor.</li> </ul>   |
| 3      | R2020  | IV       | Measurements and Instrumentation Lab U20EEP408                       | -                 | <ul style="list-style-type: none"> <li>Experiment 2(b): Measurement of inductance and Q-factor using Owen Bridge can be replaced by Maxwell Bridge</li> <li>Experiment 9: Measurement of strain, Load and Level using strain gauges has to be removed</li> </ul>  |

|   |       |                          |  |         |   |
|---|-------|--------------------------|--|---------|---|
|   |       |                          |  |         | <ul style="list-style-type: none"> <li>Experiment 10: Measurement of torque and pressure using strain gauges has to be removed</li> </ul>   |
| 4 | R2020 | IV                       | Microcontroller and its Applications Lab U20EEP409 | -       | <ul style="list-style-type: none"> <li>Experiments based on 16 bit processor has to be removed and suggested to include the experiment "Relay interfacing with PIC microcontroller".</li> </ul>   |
| 5 | R2020 | V                        | Power Electronics U20EET513                        | I       | Included the topic TRIAC  |
| 6 | R2020 | VI                       | Renewable Energy Sources U20EET617                 |         | The content in Renewable Energy Course is vast and hence, few topics need to be removed as per the suggestions given below.   |
|   |       |                          |  | I       | Suggested to remove the terms radiation, Extra-terrestrial, Spectral distribution, Solar constant, solar radiation on earth, measurements   |
|   |       |                          |  | II      | Suggested to remove the terms power extracted - wind distribution and speed prediction - wind map of India, Fundamentals - types of machines and their characteristics, Case study on Wind power generation using micro wind turbine for residential purpose. |
| 7 | R2020 | VI                       | Power System Analysis U20EET618                    | I       | Suggested to remove Power Scenario in India.  |
|   |       |                          |  | V       | Suggested to remove the term Contingency selection and ranking for the Power system.  |
| 8 | R2020 | IV Professional Elective | Energy Storage Technology U20EEE405                | I       | Suggested to remove demand for Portable Energy, Demand and Scale Requirements.  |
|   |       |                          |  | III     | Suggested to remove Shaped Metal Batteries  |
|   |       |                          |  | II, III | Removed Case Study on Hybridization of different Energy Storage Devices   |

The above corrections are incorporated and the Syllabi (Given in Annexure- II) are approved by the BoS members.

#### Agenda 4/ BoS /4 /2022 /EEE /UG

To discuss and approve the Academic Calendar for odd/even Semester of Academic year 2021-22. The classes commenced from 21.01.2022 in online mode and in offline mode for all the years from 02.02.2022 onwards.

The Academic Calendars are prepared for this semester and it includes the schedule for CAT, Model Exam, QCM, Project review and Internal Marks distributions were discussed and approved (given In Annexure-III)

- The classes are scheduled in the online mode for II, III years from 21.01.2022 to 01.02.2022.
- As per Government order, the classes for all years had commenced from 02.02.2022 onwards in offline mode.

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

To approve the Professional and Open Elective Courses offered to the III year/ VI semester students under R-2019 regulations during the period January 2022 to May 2022.

- The Professional Elective and Open Elective courses opted by III year / VI semester students under R-2019 regulations during the period January 2022 to May 2022 is listed below are approved by the BoS members.

| S. No.                             | Course Name                 | Course Code |
|------------------------------------|-----------------------------|-------------|
| <b>Professional Elective - III</b> |                             |             |
| 1                                  | Smart Grid                  | U19EEE61    |
| 2                                  | Special Electrical Machines | U19EEE63    |
| <b>Open Elective - III</b>         |                             |             |
| 1                                  | Mobile App Development      | U19ITO64    |
| 2                                  | Web Programming             | U19CCO64    |

**Agenda 6/ BoS /4 /2022 /EEE /UG**

To discuss and approve the on-line SWAYAM/MOOCs courses offered for the III year/ VI semester students under R-2019 regulations during the period January 2022 to May 2022.

- The list of online SWAYAM / MOOCs courses (given in Annexure- IV) offered for III year / VI semester students under R-2019 regulations during the period January 2022 to May 2022 was presented and approved by the BoS members.
- The list of online SWAYAM / MOOCs courses (given in Annexure- IV) offered for the Faculty of EEE department during the period January 2022 to May 2022 was presented and approved by the BoS members

**Agenda 7/ BoS /4 /2022 /EEE /UG**

To discuss and approve the Certification courses offered for the I, II and III year students under R-2019 and R-2020 regulations during the period January 2022 to May 2022.

- The semester-wise list of Certification courses offered for II and III year students under R-2019 and R-2020 regulations during the period January 2022 to May 2022 was presented and approved by the BoS members.

| Semester                           | Certification Course                              |
|------------------------------------|---|
| <b>R-2019 (Batch: 2019 – 2023)</b> |   |
| VI                                 | Artificial Intelligence and Edge computing / CCNA |
| <b>R-2020 (Batch: 2020 – 2024)</b> |   |
| III                                | Solar Smart Energy system with IOT                |
| <b>R-2020 (Batch: 2021 – 2025)</b> |   |
| I                                  | AutoCAD for Electrical                            |

**Agenda 8/ BoS /4 /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-V) was presented and recommended by the BoS members to the academic council.

**Agenda 9/ BoS /4 /2022 /EEE /UG**

To discuss various Research activities in the department

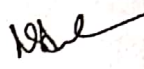
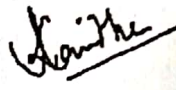
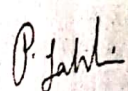
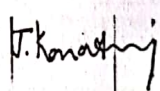
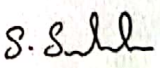
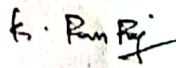
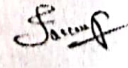
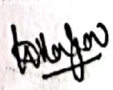
- Implementation of AICTE-MODROB during the period 2021-2023.
- Patents Publication and submission
- Journal Paper publications and submission

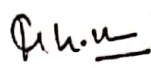
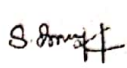
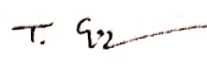


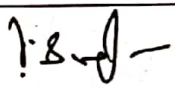


The efforts taken to improve the Research activities in the department were presented and the BoS noted the Agenda.

- Implementation of AICTE approved MODROB for the Power Electronics and Drives Lab with a sanctioned amount of 11 Lakhs is in progress.
- 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.

The Fourth meeting of BoS approval was concluded at 12.30 PM by Dr. S. Anbumalar, Chairman, Board of Studies, Department of Electrical and Electronics Engineering, Sri Manakula Vinayagar Engineering College.

| Sl.No | Name of the Member with Designation and official Address   | MEMBERS AS PER UGC NORMS                                   | Signature   |
|-------|--|--|---|
| 1     | <b>Dr.S.Anbumalar</b><br>Professor and Head<br>Department of EEE<br>SMVEC, Madagadipet-605107  | Chairman   |    |
| 2     | <b>Dr.A.Kavitha</b><br>Professor, Department of EEE<br>College of Engineering Guindy<br>Anna University<br>Chennai. 600 025.           | Subject Expert<br>(University<br>Nominee)                  |    |
| 3     | <b>Dr. P. Lakshmi</b><br>Professor, Department of EEE<br>College of Engineering Guindy<br>Anna University<br>Chennai. 600 025.         | Subject Expert<br>(Academic Council<br>Nominee)            |   |
| 4     | <b>Dr. J. Kanakaraj</b><br>Professor & Head<br>Department of EEE<br>PSG College of Technology<br>(Autonomous)<br>Coimbatore - 641 004. | Subject Expert<br>(Academic Council<br>Nominee)            |  |
| 5     | <b>Er.S. Selva Kumar</b><br>Senior Engineer<br>Qualcomm India Private Limited<br>Bengaluru, Karnataka - 560001                         | Representative<br>from Industry                            |  |
| 6     | <b>Er.K.Ramraj</b><br>Technical Director<br>LED FORSE India<br>Poornankuppam<br>Puducherry - 605 007.                                  | Postgraduate<br>Alumnus<br>(nominated by the<br>Principal) |  |
| 7     | <b>Dr. P. Jamuna</b><br>Professor<br>Department of EEE, SMVEC  | Internal Member  |  |
| 8     | <b>Dr.D.Raja</b><br>Professor<br>Department of EEE, SMVEC,<br>Madagadipet-605107   | Internal Member  |  |

|    |  |   |   |
|----|--|---|---|
| 9  | <b>Dr. K. Gowrishankar</b><br>Professor<br>Department of EEE, SMVEC ,<br>Madagadipet-605107          | Internal Member                         |  |
| 10 | <b>Dr.S.Ganesh Kumaran</b><br>Associate Professor<br>Department of EEE, SMVEC,<br>Madagadipet-605107 | Internal Member                         |  |
| 11 | <b>Dr.T.Gayathri</b><br>Professor and Head<br>Dept of Mathematics, SMVEC,<br>Madagadipet-605107      | Internal Member                         |  |
| 12 | <b>Dr.K.Kathikeyan</b><br>Associate Professor<br>Dept. of Chemistry, SMVEC,<br>Madagadipet-605107    | Internal Member                         |  |
| 13 | <b>Mrs.G.Namita</b><br>Associate Professor<br>Dept. of English, SMVEC<br>Madagadipet-605107,         | Internal Member                         |  |
| 14 | <b>Dr. P. Jayavardhane</b><br>Assistant Professor<br>Dept. of Physics, SMVEC,<br>Madagadipet-605107  | Internal Member<br>(Science & Humanity) |  |

## Annexure – I

### R2019 Syllabi

U19EET71

## INDUSTRIAL AUTOMATION AND CONTROL

| L | T | P | C | Hrs |
|---|---|---|---|-----|
| 3 | 0 | 0 | 3 | 45  |

### Course Objectives

- To apprehend the basic architecture of Industrial automation system.
- To study about the components used in PLC.
- To practice the ladder logic programming of PLC.
- To learn about the building blocks of SCADA.
- To brief about the communication protocols and IoT.

### 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 - Gain knowledge on fundamentals of IoT. (K3)

### UNIT I INTRODUCTION TO AUTOMATION

Automation overview – requirement of automation systems – architecture of industrial automation system – Levels of Automation-basic elements of an automated system – industrial bus systems: modbus and profibus. (9 Hrs)

### UNIT II PROGRAMMABLE LOGIC CONTROLLERS

Introduction to PLC, Principles of Operation - Size and Application. Hardware Components: I/O Section, Discrete /Analog I/O Modules, Special I/O Modules, CPU, Memory Design, Memory Types, Programming Terminal Devices, Recording and Retrieving Data - Processor Memory Organization, Relay-Type Instructions, Instruction Addressing, Branch Instructions, Internal Relay Instructions. (9 Hrs)

### UNIT III LADDER LOGIC PROGRAMMING

PLC Wiring Diagrams and Ladder Logic Programs: Electromagnetic Control Relays, Contactors, Motor Starters, Manual/Mechanical Operated Switches, Sensors, Output Control Devices, Seal-in Circuits, Latching Relays, Converting Relay Schematics into PLC Ladder Programs, Programming Timers: Mechanical Timing Relays, Timer Instructions, On-Delay /Off-Delay Timer Instruction, Retentive Timer, Cascading Timers. (9 Hrs)

### UNIT IV SCADA FUNDAMENTALS

Introduction, Open system: Need and advantages, Building blocks of SCADA systems, RTU-Evolution, Components, Communication, Logic, Termination and Testing and HMI subsystem - Power supplies, Advanced RTU functionalities, IEDs, Data concentrators and merging units. Master Station: Software /Hardware components, Server systems in the master station, Small, medium, and large master stations, GPS. (9 Hrs)

### UNIT V INTRODUCTION TO IoT

IoT fundamentals, IoT Architecture and protocols, Various Platforms, IoT components and Communication Technologies, Challenges in IoT, Case study. (9 Hrs)

### Text Books

1. Frank D. Petruzella, "Programmable Logic Controllers", McGraw Hill, 4<sup>th</sup> Edition, 2011
2. Mini S. Thomas, "Power System SCADA and Smart Grids", CRC Press, 3<sup>rd</sup> Edition April 2015.
3. S. Mukhopadhyay, S. Sen and A. K. Deb, "Industrial Instrumentation, Control and Automation", Jaico Publishing House, 1<sup>st</sup> Edition, 2013.
4. Jeeva Jose, "Internet of Things", Khanna Publishing House, 1<sup>st</sup> Edition, 2018.

### Reference Books

1. Gary Dunning, "Introduction to Programmable Logic Controllers", Cengage Learning, 3<sup>rd</sup> India Edition, 2007.
2. Frank lamb, "Industrial Automation: Hands On", McGraw-Hill Education, 1<sup>st</sup> Edition, 2013.
3. T. Huges, "Programmable Logic Controllers", ISA press, 1994.
4. William T. Shaw, "Cybersecurity for SCADA systems", Penn Well Books, 2006.
5. Arshdeep Bahga, Vijay Madiseti, "Internet of Things: A Hands-on Approach", 1<sup>st</sup> Edition, 2014

### Web References

1. <https://electrical-engineering-portal.com/download-center/books-and-guides/automation-control/plc-ladder-sequential-programming>
2. [https://www.beckhoff.com/english.asp?start/?pk\\_campaign=AdWords-AdWordsSearch-IndustrialAutomationEN&pk\\_kwd=industrial%20automation](https://www.beckhoff.com/english.asp?start/?pk_campaign=AdWords-AdWordsSearch-IndustrialAutomationEN&pk_kwd=industrial%20automation)
3. <https://www.plantaautomation-technology.com/articles/an-overview-of-distributed-control-systems-dcs>
4. <https://www.controleng.com/articles/scada-remains-relevant-for-industrial-automation/>
5. <https://sw.aveva.com/monitor-and-control/scada>

Page | 10

Department of EEE – Fourth Meeting of BoS

**COs/POs/PSOs Mapping**

| 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   | 3   | 3   | -   | -   | -   | -   | -   | -    | -    | 1    | 3                                | 3    | 3    |
| 2   | 3                      | 3   | 3   | 3   | -   | -   | -   | -   | -   | -    | -    | 1    | 3                                | 3    | 3    |
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| 5   | 3                      | 3   | 3   | 3   | -   | -   | -   | -   | -   | -    | -    | 1    | 3                                | 3    | 3    |

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



**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**

1. Study of basic programming of PLC
2. Arithmetic operation, Timer, Counter operation using PLC
3. PLC based control of Level Process , Temperature Process, Speed .
4. Annunciator system using PLC
5. PLC based control of batch process system
6. Bottle filling system using PLC
7. a. Interfacing of lamp and button with PLC for ON/OFF operation.  
b. Perform Delayed Operation of Lamp By Using Push Button.
8. Combination of Counter and Timer for Lamp ON/OFF operation.
9. DOL Starter and Star Delta Starter operation by using PLC.
10. Develop/ Execute ladder program for the Control of automatic bottle filling system.
11. Develop/ Execute ladder program for Traffic Light Control
12. Develop/ Execute ladder program for Reversal of DC Motor Direction
13. Develop/ Execute ladder program for Stair case lighting
14. IoT - based Street light monitoring and control
15. 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, 1<sup>st</sup> Edition, 2013.
2. Gary Dunning, "Introduction to Programmable Logic Controllers", Cengage Learning, 3<sup>rd</sup> India Edition, 2007.
3. Frank lamb, "Industrial Automation: Hands On", McGraw-Hill Education, 1<sup>st</sup> Edition, 2013.
4. T. Huges, "Programmable Logic Controllers", ISA press, 1994.
5. R. Krishnan, "Electric Motor Drives, Modelling, Analysis and Control", Pearson Education India, 1<sup>st</sup> Edition, 2015.
6. Viswanandham, "Performance Modeling of Automated Manufacturing Systems", PHI, 1<sup>st</sup> Edition, 2009.
7. Jose A. Romagnoli, Ahmet Palazoglu, "Introduction to Process control", CRC Taylor and Francis group, 3<sup>rd</sup> Edition, 2020.

**Web References**

1. <https://electrical-engineering-portal.com/download-center/books-and-guides/automation-control/plc-ladder-sequential-programming>
2. [https://www.beckhoff.com/english.asp?start/?pk\\_campaign=AdWords-AdWordsSearch-IndustrialAutomationEN&pk\\_kwd=industrial%20automation](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.plantaautomation-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 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1                             | PSO2 | PSO3 |
| 1   | 3                      | 3   | 3   | 3   | -   | -   | -   | -   | -   | -    | -    | 1    | 3                                | 3    | 3    |
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| 3   | 3                      | 3   | 3   | 3   | -   | -   | -   | -   | -   | -    | -    | 1    | 3                                | 3    | 3    |
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| 5   | 3                      | 3   | 3   | 3   | -   | -   | -   | -   | -   | -    | -    | 1    | 3                                | 3    | 3    |

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



**Course Objectives**

- To introduce different methods of analog communication systems and their significance.
- To introduce Digital Communication methods for high bit rate transmission.
- To introduce MAC used in communication systems for enhancing the number of users.
- To explain the various media for digital communication.
- To deliberate the use of Power Lines for communication.

**Course Outcomes**

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

- CO1 - Comprehend the basic Characteristics of the signals and analog modulation techniques. (K2)  
 CO2 - Comprehend the needs of modulation and various Digital modulation techniques. (K3)  
 CO3 - Describe multiple access techniques and its applications. (K2)  
 CO4 - Explain the advanced communication systems. (K2)  
 CO5 - Explore the role of Communication Engineering in the realization of Smart grids (K2)

**UNIT I ANALOG COMMUNICATION**

(9 Hrs)  
 Modulation –need for modulation - AM – Frequency spectrum – vector representation – power relations – generation of AM – DSB, DSB/SC, SSB, VSB AM Transmitter and Receiver; FM and PM – frequency spectrum – power relations: NBFM and WBFM, Generation of FM and PM, Armstrong method and Reactance modulator:

**UNIT II DIGITAL COMMUNICATION**

(9 Hrs)  
 Pulse modulations: PAM, PWM, PPM - Sampling theorems - quantization, PCM, DM, DPCM - Digital modulations: ASK, FSK, PSK, BSK, applications of Data communication.

**UNIT III MULTIPLE ACCESS TECHNIQUES**

(9 Hrs)  
 SS and MA techniques: FDMA, TDMA, CDMA, SDMA application in wire and wireless communication : Advantages (merits)

**UNIT IV SATELLITE AND FIBRE OPTIC COMMUNICATION**

(9 Hrs)  
 Orbital aspects-Geostationary satellites-Satellite Uplink - Satellite Downlink - Satellite Transponder - Modulation techniques for satellite links - Satellite Earth station  
 Principle of light propagation in fibre - Index profiles - Modes of propagation - Losses in fibre -Dispersion -Light sources and detectors- Fibre optic communication link

**UNIT V POWER LINE COMMUNICATION**

(9 Hrs)  
 Power Supply networks - Narrowband and Broadband PLC – Structure of PLC access network – PLC network elements – connection to core network – structure campus communication network and performance issues – Architecture of smart grid technology.

**Text Books**

1. Taub & Schilling, "Principles of communication systems", Tata McGraw hill, 2007.
2. J.Das, "Principles of digital communication", New Age International, 1986.
3. Halid Harasnica, Ralf Lehner, "Broad band Power line Communications Design", John Wiley and Sons, 2005

**Reference Books**

1. Simon Haykin, "Communication Systems", Tata McGraw Hill, 4<sup>th</sup> Edition.
2. Kennedy and Davis, "Electronic Communication Systems", Tata McGraw hill, 4th Edition, 1993.
3. Sklar, "Digital Communication Fundamentals and Applications", Pearson Education, 2001.
4. Baryle, Memuschmidt, "Digital Communication", Kluwer Publication, 2004.
5. B.P.Lathi, "Modern Digital and Analog Communication Systems", Oxford University Press, 1998.
6. K. Muralibabu, "Communication Engineering", Lakshmi Publications, 2013.

**Web References**

1. [www.electronicslab.info/files/cce2310/Amplitude%20modulation.pdf](http://www.electronicslab.info/files/cce2310/Amplitude%20modulation.pdf)
2. [nptel.ac.in/courses/IIT-MADRAS/Principles of.../pdfs/1\\_8.pdf](http://nptel.ac.in/courses/IIT-MADRAS/Principles of.../pdfs/1_8.pdf)
3. [yoonc01.tistory.com/attachment/fk100000000032.ppt](http://yoonc01.tistory.com/attachment/fk100000000032.ppt)
4. [nptel.ac.in/courses/117101053/](http://nptel.ac.in/courses/117101053/)
5. [nptel.ac.in/courses/117105085/](http://nptel.ac.in/courses/117105085/)

**COs/POs/PSOs Mapping**

| 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                      | 1   | 2   | -   | 2   | -   | -   | -   | -   | -    | 1    | 1    | -                                | 2    | 2    |
| 2   | 3                      | 1   | 2   | -   | 2   | -   | -   | -   | -   | -    | 1    | 1    | -                                | 2    | 2    |
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| 5   | 3                      | 1   | 2   | -   | 2   | -   | -   | -   | -   | -    | 1    | 1    | -                                | 2    | 2    |

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





**Course Objectives**

- To provide conceptual knowledge of various types of DC – DC converters.
- To impart the knowledge on various types of switched mode power converters and its voltage control techniques
- To understand the importance of Zero voltage and Zero current switching used in resonant converters
- To analyze the PWM techniques and harmonic reduction techniques in DC – AC converters.
- To explain the various types of filters and techniques to improve the power quality.

**Course Outcomes**

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

- CO1 - Design the DC-DC converters for different applications. (K2)  
 CO2 - Analyze, design and select the converters used for switched mode power supplies in Computers, Laptop, and TV. (K4)  
 CO3 - Describe the importance of resonant Converters in reducing power loss and improving the life time of the power semiconductor device. (K2)  
 CO4 - Conclude the different voltage and harmonics reduction techniques used for DC-AC converters. (K4)  
 CO5 - Interpret knowledge on the techniques used to improve the power quality and design of filters for UPS. (K2)

**UNIT I DC - DC CONVERTERS**

(9 Hrs)

Principles of DC-DC Converters – Analysis and state space modeling of Buck, Boost, Buck- Boost and Cuk converters, Choice of switching frequency – Device Selection - EMI issues

**UNIT II SWITCHED MODE POWER CONVERTERS**

(9 Hrs)

SMPS Types: Self-Oscillating Flyback, Forward, Push pull, Luo, Half bridge and fullbridge converters- control circuits and PWM techniques - SMPS with multiple outputs - Choice of switching frequency – Device Selection - State space modeling.

**UNIT III RESONANT CONVERTERS**

(9 Hrs)

Introduction- classification - Load Resonant converters - ZVS, ZCS, Clamped voltage topologies- DC link inverters with Zero Voltage Switching- Series and parallel Resonant inverters- Voltage control. Multi energy storage element resonant converters - two, three and four element RPS - Application of Regulated Power Supply.

**UNIT IV DC – AC CONVERTERS**

(9 Hrs)

Single phase and three phase inverters - control techniques, harmonic elimination techniques - Multilevel inverters -Concepts - Types: Diode clamped, Flying capacitor, Cascaded types; Switched Inductor and Capacitor multilevel Inverter - Applications.

**UNIT V POWER CONDITIONERS, UPS AND FILTERS**

(9 Hrs)

Introduction- Power line disturbances- Power conditioners –UPS: offline UPS, Online UPS – Filters: Voltage filters, Series-parallel resonant filters, filter without series capacitors, filter for PWM VSI, current filter, DC filters – Design of high frequency inductor and transformer – Selection of capacitor and Batteries

**Text Books**

1. Simon Ang, Alejandro Oliva, "Power-Switching Converters", CRC Press, 3<sup>rd</sup> Edition, 2010.
2. Kjeld Thorborg, "Power Electronics – In theory and Practice", Overseas Press India Private Ltd, 1<sup>st</sup> Edition, 2005.
3. M. H. Rashid, "Power Electronics handbook", Elsevier Publication, 4<sup>th</sup> Edition, 2017.

**Reference Books**

1. Philip T Krein, "Elements of Power Electronics", Oxford University Press, 2<sup>nd</sup> Edition, 2014.
2. Erickson, W. Robert, "Fundamentals of Power Electronics", Springer, 2<sup>nd</sup> Edition, 2010.
3. Joseph Vithayathil, "Power Electronics, Principles and Applications", McGraw Hill Series, 6<sup>th</sup> Reprint, 2013.
4. Ned Ned Mohan, Tore M. Undeland, William P. Robbins, "Power Electronics: -Converters, Applications, and Design", John Wiley and sons Publication, 3<sup>rd</sup> Edition, 2010.
5. Fang Lin Luo, "Advanced DC/AC converters: Applications in renewable Energy", CRC press, 1<sup>st</sup> Edition, 2013.

**Web References**

1. <https://nptel.ac.in/courses/108/105/108105066/>
2. <http://www.ni.com/white-paper/14677/en/>
3. <http://www.smps.us/>
4. <http://www.cpes.vt.edu/areas/>
5. <https://www.coursera.org/specializations/power-electronics>

**COs/POs/PSOs Mapping**

| 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   | 3   | 2   | 2   | -   | -   | -   | -   | -    | -    | 1    | 3                                | 3    | 3    |
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| 5   | 3                      | 3   | 3   | 2   | 2   | -   | -   | -   | -   | -    | -    | 1    | 3                                | 3    | 3    |

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



## Annexure – II

### R2020 Syllabi

|           |  |          |          |          |          |            |
|-----------|--|----------|----------|----------|----------|------------|
| U20EET411 | <b>MEASUREMENTS AND INSTRUMENTATION FOR ELECTRICAL ENGINEERING</b> | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> | <b>Hrs</b> |
|           |  | <b>3</b> | <b>0</b> | <b>0</b> | <b>3</b> | <b>45</b>  |

#### Course Objectives

- To give the students an insight into the constructional details and working principles of various measuring instruments.
- To provide the use of different types of analog and digital meters for measuring electrical and physical quantities.
- To demonstrate various Bridges for the measurement of resistance, inductance and capacitance.
- To provide the procedure to calibrate an energy meter.
- To understand and apply different types of sensors for the measurement of physical quantities such as speed, torque, pressure, displacement, temperature, etc.

#### Course Outcomes

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

**CO1** - Acquire knowledge on the characteristics of measuring instruments and their classification. **(K2)**

**CO2** - Conversant in construction, working of A.C / 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)**

**CO5** - Demonstrate the various types of transducers used for physical measurements. **(K3)**

#### **UNIT I INTRODUCTION TO MEASUREMENT**

**(9 Hrs)**

Functional elements of Generalized measurement system - Types of measurement - Classification of instruments - Static and Dynamic characteristics of instruments - Mean, Standard deviation - error - Accuracy, Precision, Sensitivity, Linearity, Resolution, Hysteresis, Threshold, Input impedance - loading effects - Probability of errors - Errors in Measurements.

#### **UNIT II ELECTRICAL INSTRUMENTS**

**(9 Hrs)**

Essential requirements of an instrument - Ammeter and voltmeter - Moving coil - Moving Iron - Extension of voltmeter and ammeter range - Electro dynamo meter type Wattmeter - Induction type Energy meter - Measurement of active and reactive powers in balanced and unbalanced systems - Instrument Transformers - Construction, phasor diagrams - Magnetic measurements - Determination of B-H curve and measurements of iron loss.

#### **UNIT III DIGITAL INSTRUMENTS**

**(9 Hrs)**

Digital Volt Meter and its design - Voltage ratio measurement techniques - Digital ohmmeter, capacitance meter - impedance meters (Polar and Cartesian types) - Signal analyzers: spectrum and logic analyzers - Digital Frequency Meter - Measurement of Frequency - Study of Phasor Measurement Units (PMU).

#### **UNIT IV BRIDGES AND DISPLAY DEVICES**

**(9 Hrs)**

Bridges: Measurement of resistances - D.C potentiometer - Wheat stone, Kelvin and Kelvin's Double bridge - A.C bridges for measurement of L and C - Maxwell, Anderson, Hay, Wein and Schering bridges - Measurement of earth resistance.

Display Devices: CRT display, analog and digital CRO, LED, and LCD.

#### **UNIT V TRANSDUCERS**

**(9 Hrs)**

Transducers - Definition and classification - Linear Displacement: Resistive Potentiometers, strain gauge. LVDT, Capacitive Piezoelectric - Rotational Displacement: magnetic, Position: synchro Transmitter and receiver - speed: Magnetic and photo electric pickup transducer - Temperature: Thermistors, thermocouple - Flow Electromagnetic, Ultrasonic - Level: DP cell, Ultrasonic - Density: Hydrometer - Voltage, current and power Hall Effect transducer

#### **Text Books**

1. A.K. Sawhney, "A Course in Electrical & Electronic Measurements and Instrumentation", Dhanpat Rai and Co., New Delhi, 19<sup>th</sup> Edition, 2015.
2. J. B. Gupta, "A Course in Electronic and Electrical Measurements", S. K. Kataria & Sons, Delhi, 12<sup>th</sup> Edition, 2009.
3. E. O. Doebelin and D. N. Manik, "Measurement Systems - Applications and Design", Tata McGraw Hill Education Pvt. Ltd., Special Indian Edition, 2007.

### Reference Books

1. David Bell, "Electronic Instrumentation and Measurements", Oxford University Press, 1<sup>st</sup> Edition, 2013.
2. A. J. Bouwens, "Digital Instrumentation", Tata McGraw Hill Publications, 16<sup>th</sup> Reprint Edition, 2008.
3. H.S. Kalsi, "Electronic Instrumentation", Tata McGraw Hill Education, 4<sup>th</sup> Edition, 2019.
4. C.S. Rangan, G.R. Sharma and V. S. V. Mani, "Instrumentation Devices and Systems", Tata McGraw Hill Book Co., New Delhi, 1<sup>st</sup> Edition, 2004.

### Web References

1. [https://www.omega.de/green/pdf/CAP\\_LEV\\_MEAS.PDF](https://www.omega.de/green/pdf/CAP_LEV_MEAS.PDF)
2. <https://nptel.ac.in/courses/108/105/108105153/>
3. <http://www.nptelvideos.in/2012/11/industrial-instrumentation.html>
4. <http://labs.iitkgp.emet.in/asnm/>
5. <https://www.youtube.com/watch?v=xLjk5DrScEU>
6. <http://www.wisegeek.com/what-are-transducers.htm>

### COs/POs/PSOs Mapping

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

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



**Course Objectives**

- To get familiar with basic architecture and programming techniques of microprocessor 8085.
- To learn interfacing of memory and data transfer techniques using microcontroller.
- To understand the interfacing of input/output devices required for real time applications.
- To introduce the basic concepts of embedded system design using microcontroller.
- To equip the student with ability to design PWM control for various application such as AC-DC, DC-DC converter, etc.

**Course Outcomes**

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

- CO1 - Illustrate the architecture of microprocessor and to develop skills in writing assembly language program. (K3)
- CO2 - Have a clear understanding of microcontroller architecture with functional details of each pin. (K3)
- CO3 - 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 I<sup>2</sup>C and SPI using PIC Microcontroller. (K4)
- CO5 - Design and develop microcontroller based real-time applications. (K4)

**UNIT I ARCHITECTURE AND PROGRAMMING OF 8085 MICROPROCESSOR**

(9 Hrs)

8085 Microprocessor: Architecture, Addressing modes, Instruction set - Assembly language programs - Machine cycles and Timing diagrams. Application: Interfacing of stepper motor control with 8085 microprocessor

**UNIT II INTRODUCTION TO PIC16F MICROCONTROLLER**

(9 Hrs)

Microprocessor and Microcontroller difference - RISC and CISC programmer's model - Criteria for selecting microcontroller - Overview of PIC family - PIC16F877A architecture, status register, Special function registers memory organization, On-Chip peripherals - PIC16F877A pin configuration - Fuse bits of PIC

**UNIT III PIC16F PROGRAMMING**

(9 Hrs)

Data types and assembler directives - Addressing modes - Instruction set - Bit addressability - MACROs - Intel HEX file - Programming Tools: MPLAB IDE - I/O Port Programming, Timer programming, PWM programming, External Interrupt programming, ADC programming, EEPROM programming

**UNIT IV SERIAL COMMUNICATION PROTOCOLS AND ITS PROGRAMMING**

(9 Hrs)

Introduction to UART protocol and its programming - I<sup>2</sup>C protocol and its Programming - SPI protocol and its Programming - Serial Port programming.

**UNIT V PERIPHERAL INTERFACING AND ITS PROGRAMMING**

(9 Hrs)

LCD and Keyboard Interfacing - Relay interfacing - Stepper and DC Motor control - RTC Interfacing - LM35 Temperature sensor interfacing - MAX7219 display controller interfacing - Ultrasonic sensors interfacing - Introduction to PIC24F and dsPIC33EV

**Text Books**

- Muhammad Ali Mazidi, Sarmad Naimi and Sepehr Naimi, "PIC Microcontroller and Embedded Systems: Using Assembly and C for PIC18", Micro Digital Education, Illustrated Edition, 2017.
- Ramesh S Gaonkar, "Microprocessor Architecture: Programming and Applications with the 8085", Prentice Hall of India, New Delhi, 5<sup>th</sup> Edition, 2011.

**Reference Books**

- Sunil Mathur, Jeebananda Panda, "Microprocessor and microcontroller", PHI Learning Private Limited, New Delhi, 1<sup>st</sup> Edition, 2016.
- dsPIC33EV data sheet

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- <https://www.microchip.com>
- <https://www.youtube.com/watch?v=S1QCZW92fU4>
- <https://www.microchip.com/promo/explorer-8-development-board>
- <https://www.mikroe.com/easymx-pro-stm32>
- [https://www.microchip.com/DevelopmentTools/ProductDetails/DM240001-2#utm\\_source=MicroSolutions&utm\\_medium=Link&utm\\_term=FY17Q3&utm\\_content=MCU16&utm\\_campaign=Article](https://www.microchip.com/DevelopmentTools/ProductDetails/DM240001-2#utm_source=MicroSolutions&utm_medium=Link&utm_term=FY17Q3&utm_content=MCU16&utm_campaign=Article)



**COs/POs/PSOs Mapping**

| 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   | 3   | 2   | 3   | -   | -   | -   | -   | -    | -    | 3    | 3                                | 3    | 3    |
| 2   | 3                      | 3   | 3   | 2   | 3   | -   | -   | -   | -   | -    | -    | 3    | 3                                | 3    | 3    |
| 3   | 3                      | 3   | 3   | 2   | 3   | -   | -   | -   | -   | -    | -    | 3    | 3                                | 3    | 3    |
| 4   | 3                      | 3   | 3   | 2   | 3   | -   | -   | -   | -   | -    | -    | 3    | 3                                | 3    | 3    |
| 5   | 3                      | 3   | 3   | 2   | 3   | -   | -   | -   | -   | -    | -    | 3    | 3                                | 3    | 3    |

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



**Course Objectives**

- To give the students an insight into the constructional details of various measuring instruments for better understanding of their working principles.
- To demonstrate various Bridges for the measurement of resistance, inductance and capacitance using simulation and hardware set ups.
- To understand the concept of magnetism and to determine the B-H curve for magnetic material specimen.
- To provide the procedure to calibrate an energy meter.
- To test and apply different types of sensors for the measurement of physical quantities such as speed, torque, pressure, displacement, temperature, etc. by conducting an appropriate experiment.

**Course Outcomes**

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

- CO1 - Realize the advantages and the necessity of measurement systems in all Engineering and Scientific works. (K2)
- CO2 - Measure Resistance, Inductance and capacitance using AC and DC bridges. (K3)
- CO3 - Determine the magnetization characteristics and hysteresis loss of Iron specimen using BH curve. (K3)
- CO4 - Calibrate single phase and three phase energy meters used in domestic and commercial applications. (K3)
- CO5 - Determine the characteristics of RTD, thermostat, strain gauge and LVDT transducers and to apply for the physical quantities measurements. (K3)

**List of Experiments**

1. (a) Measurement of resistance using Wheatstone bridge  
(b) Measurement of insulation resistance.
2. (a) Measurement of capacitance and loss angle of capacitor using Schering Bridge.  
(b) Measurement of inductance and Q-factor using Maxwell Bridge.
3. Extension of voltmeter and ammeter.
4. Calibration of single phase and three phase Energy meter using loading method.
5. Determination of B-H Curve for the magnetic material specimen.
6. Calibrate Current Transformer and Potential Transformer to determine ratio error and phase errors.
7. Characteristic of Temperature transducers (LDR, thermistor and thermocouple).
8. Measurement of Displacement using transducers.
9. Measurement of Voltage, current and power using Hall Effect transducer.
10. Characteristics of Optical Transducers ( LDR, Phototransistor, Photovoltaic and photoconductive cells)
11. Measurement of speed using Magnetic and photo electric pickup transducers.
12. Measurement of Position using synchro Transmitter and receiver
13. Spectrum analyser and its use for analysing frequency spectra of periodic and non-periodic signals.

**Reference Books**

1. A. K. Sawhney, "A course in Electrical and Electronics Measurement and Instrumentation", Dhanpat Rai and Sons, 19<sup>th</sup> Edition, 2015.
2. William D. Coopers and Albert D. Helfrick, "Modern Electronic instrumentation and Measurements Techniques", Pearson Education India, 1<sup>st</sup> Edition, 2002.
3. E. W. Golding and F. C. Widdis, "Electrical Measurements and Measuring Instruments", Medtech Publication, 6<sup>th</sup> Edition, 2019.
4. H.S. Kalsi, "Electronic Instrumentation", Tata McGraw-Hill Education, 4<sup>th</sup> Edition, 2019.
5. C. D. Johnson, "Process Control Instrumentation Technology", Pearson Education India, 8<sup>th</sup> Edition, 2015.
6. Electrical Business Magazine, (Online edition of Electrical Industry Magazine)
7. Instrumentation and Measurement Magazine, IEEE.
8. Instrumentation and Measurement, IEEE Transactions.
9. Science, Measurement and Technology, IET Journal.
10. Measurements, Elsevier Journal.

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1. [https://www.omega.de/green/pdf/CAP\\_LEV\\_MEAS.PDF](https://www.omega.de/green/pdf/CAP_LEV_MEAS.PDF)
2. <https://nptel.ac.in/courses/108/105/108105153/>



3. <http://www.nptelvideos.in/2012/11/industrial-instrumentation.html>
4. <http://vlabs.iitkgp.ernet.in/asnm/>
5. <http://www.wisegeek.com/what-are-transducers.htm>

### COs/POs/PSOs Mapping

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

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





**Course Objectives**

- To become familiar with architecture and instruction set for 8085.
- To provide hands-on training of interfacing external sensors and actuators with microcontroller
- To impart knowledge for on-chip peripheral programs
- To impart knowledge to generate pulses for electrical applications.
- To impart knowledge to do minor projects using microcontroller for solving real world engineering problems

**Course Outcomes**

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

- CO1** - Develop assembly language program for microprocessor 8085. (K3)  
**CO2** - Analyze various platforms for programming by knowing the complete hardware configurations. (K4)  
**CO3** - Analyze abstract problems and apply a combination of hardware and software to address the problem. (K4)  
**CO4** - Design a control algorithm for various applications using microcontrollers. (K3)  
**CO5** - Design and generate pulses for real time electrical applications. (K3)

**List of Experiments****Microprocessor Experiments using 8085:**

1. 8 bit - Addition, Subtraction, Multiplication and Division
2. Assembly Language Programming: Subroutines, parameter passing to subroutines

**Microcontroller Experiments using PIC:**

3. PIC Assembly language- Programming using the PIC Instruction Set.
4. a) PIC Timer to generate accurate delay  
b) PIC Timer to generate waveforms
5. Seven Segment Display interfacing with PIC
6. a) 16x2 LCD interfacing with PIC  
b) 4x4 matrix keyboard interfacing with PIC
7. PIC UART programming
8. PIC on-chip ADC for interfacing analog sensors

**Application of Microcontroller using PIC:**

9. Experimentation of DC Motor Interfacing and Speed/Direction Control with PIC
10. Stepper motor interfacing with PIC
11. Relay interfacing with PIC
12. DS1307 RTC Interfacing with PIC
13. MAX7219 LED matrix driver Interfacing with PIC using SPI protocol
14. Interface to peripherals and use of the I2C bus

**Reference Books**

1. Muhammad Ali Mazidi, Sarmad Naimi and Sepehr Naimi, "The AVR Microcontroller and Embedded Systems Using Assembly and C", Micro Digital Education, Illustrated Edition, 2017.
2. Ramesh S Gaonkar, "Microprocessor Architecture: Programming and Applications with the 8085". Prentice Hall of India, New Delhi, 5<sup>th</sup> Edition, 2011.
3. Sunil Mathur, Jeebananda Panda, "Microprocessor and microcontroller", PHI Learning Private Limited New Delhi, 1<sup>st</sup> Edition, 2016.
4. dsPIC33EVdata sheet.

**Web References**

1. <https://www.microchip.com>
2. <https://www.youtube.com/watch?v=S1QCZW92fU4>
3. <https://www.microchip.com/promo/explorer-8-development-board>
4. <https://www.mikroe.com/easymx-pro-stm32>
5. [https://www.microchip.com/DevelopmentTools/ProductDetails/DM240001-2#utm\\_source=MicroSolutions&utm\\_medium=Link&utm\\_term=FY17Q3&utm\\_content=MCU16&utm\\_campaign=Article](https://www.microchip.com/DevelopmentTools/ProductDetails/DM240001-2#utm_source=MicroSolutions&utm_medium=Link&utm_term=FY17Q3&utm_content=MCU16&utm_campaign=Article)

**COs/POs/PSOs Mapping**

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| 5   | 2                      | 3   | 3   | 3   | 2   | -   | -   | -   | -   | -    | -    | 2    | 2                                | 2    | 3    |

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



**Course Objectives**

- To explain about the operations, switching characteristics of power semiconductor devices
- To study the operations and performance parameters of controlled Rectifiers.
- To analyze the operation and performance of dc to dc converters.
- To impart knowledge on different control techniques for inverters.
- To familiarize the principle of operation of AC voltage controllers and cyclo converters

**Course Outcomes**

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

- CO1 - Discriminate the switching characteristics of power devices and to use for power conversion. (K2)
- CO2 - Inspect the performance of control rectifiers in continuous and discontinuous modes. (K2)
- CO3 - Acquire knowledge on operation and analysis of DC to DC converters (K2)
- CO4 - Outline the operating principles of various types of inverters. (K2)
- CO5 - Gain knowledge on the operation of AC to AC converters and its applications (K2)

**UNIT I POWER SEMI-CONDUCTOR DEVICES**

(9 Hrs)

Study of switching characteristics of MOSFET, IGBT, SCR and TRIAC, Turn on and Turn off methods of SCR - Protection circuits - Triggering circuits.

**UNIT II PHASE-CONTROLLED CONVERTERS**

(9 Hrs)

Operation and analysis of single and three phase controlled rectifiers - half and fully controlled Converters with R, RL and RLE loads - Effect of source inductance on controlled rectifiers - Power factor and harmonic improvement methods - series converter, twelve pulse converter, Dual converter- circulating and non-circulating current mode.

**UNIT III DC TO DC CONVERTERS**

(9 Hrs)

Principles of step down and step up chopper - Class A, B, C, D and E chopper, voltage commutated, current commutated chopper, multi-phase chopper, principle of operation of buck, boost and buck boost regulators - switching schemes.

**UNIT IV INVERTERS**

(9 Hrs)

Single phase and three phase voltage source inverters - Voltage and harmonic control techniques - Capacitor commutated current source inverter and auto sequential current source inverter.

**UNIT V AC CHOPPER AND CYCLO CONVERTERS**

(9 Hrs)

Single phase and Three-phase AC voltage controllers - Control strategy - Single phase step-up/step-down midpoint type and bridge type cyclo-converters - Three phase cyclo-converters. Applications - regulated power supply, UPS, solid-state motor starter.

**Text Books**

1. P. S. Bimbhra, "Power Electronics", Khanna Publishers, New Delhi, 6<sup>th</sup> Edition, 2018.
2. M.H. Rashid, "Power Electronics: Circuits, Devices and Applications", Pearson Education, New Delhi, 4<sup>th</sup> Edition, 2017.

**Reference Books**

1. Ned Mohan, M. Underland, William P. Robbins, "Power Electronics Converters, applications and design", JohnWiley & sons, Singapore, 2001.
2. M. D. Singh, K. B. Khanchandani, "Power Electronics", Tata McGraw Hill, New Delhi, 2007.
3. Cyril W. Lander, "Power Electronics", McGraw Hill Book Company, Singapore, 1993.
4. Williams B.W., "Power Electronics Devices, drivers, applications and passive components", McMillan Press Ltd., London, 1992.

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2. <https://www.allaboutcircuits.com/technical-articles/a-review-on-power-semiconductor-devices/>
3. <https://www.electrical4u.com/concept-of-power-electronics/>
4. <https://nptel.ac.in/courses/108/101/108101038/>
5. <https://nptel.ac.in/courses/108/102/108102145/>

**COs/POs/PSOs Mapping**

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| 3   | 3                      | 2   | 3   | 3   | 2   | -   | -   | -   | -   | -    | -    | 1    | 3                                | 3    | 3    |
| 4   | 3                      | 2   | 3   | 3   | 2   | -   | -   | -   | -   | -    | -    | 1    | 3                                | 3    | 3    |
| 5   | 3                      | 2   | 3   | 3   | 2   | -   | -   | -   | -   | -    | -    | 1    | 3                                | 3    | 3    |

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



**Course Objectives**

- To impart knowledge on renewable energy sources and technologies.
- To gain adequate knowledge on variety of issues in harnessing renewable energy sources.
- To outline about the alternate renewable energy sources for both domestic and industrial applications.
- To provide knowledge about grid connectivity in renewable energy systems.
- To provide in-depth knowledge in the key concepts of energy policies.

**Course Outcomes**

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

- CO1 - Analyze the national and international energy scenario of renewable energy Sources. (K2)
- CO2 - Design the aerodynamics of wind turbines and calculate their energy production. (K3)
- CO3 - Analyze electrical power generation from biomass, geothermal, tidal, wave etc. (K2)
- CO4 - Analyze technical and sustainability issues involved in the integration of renewable energy systems. (K2)
- CO5 - Compare the cost economics of using renewable energy sources with non-renewable energy sources (K2)

**UNIT I SOLAR ENERGY**

Overview - Limitations of conventional energy resource - Importance of renewable sources - Types - Present Indian and international energy scenario. Solar Energy: solar thermal power and its energy conversion - solar collectors - types and applications. Photovoltaic (PV) technology - photovoltaic effect - efficiency of solar cells - Design Concept of solar PV system - standards and applications. (9 Hrs)

**UNIT II WIND AND HYDRO POWER ENERGY**

Wind Energy: wind data - properties - speed and power relation - wind turbines and electric generators - horizontal and vertical wind mills - wind energy farms - off-shore plants- Selection factors. Hydro Energy: small mini and micro hydro power plants and their resource assessment - plant layout with major components - selection factors-application. (9 Hrs)

**UNIT III ALTERNATE ENERGY SOURCES**

Biomass: Photosynthesis and origin of biomass energy - terms and definitions - pyrolysis, thermo-chemical biomass conversion to energy, Geothermal: resources, hot spring, steam system, site selection, challenges Ocean and Tidal energy: principle of OTEC - wave energy conversion machines - fundamentals of tidal power conversion systems and limitations - Introduction to fuel cells. (9 Hrs)

**UNIT IV GRID INTEGRATION**

Wind power interconnection requirement - low-voltage ride through (LVRT), ramp-rate limitations, supply of ancillary services for frequency and voltage control - load and reserve requirement - issues in interconnection - steady - state and dynamic performance of power system - interfacing solar system with grid - protective relaying - islanding, Power quality issues. (9 Hrs)

**UNIT V RENEWABLE ENERGY POLICY**

Renewable energy policies: Five Year Plan programmes - Feed-in tariffs - portfolio standards - policy targets, tax incentives - bio-fuels mandates - International policies for climate change and energy security - Economic analysis and comparisons - Life cycle analysis - financial analysis - cost of conserved energy and externalities - Cost assessment of supply technologies versus energy - Efficiency - Renewable Energy Certification - Carbon contents. (9 Hrs)

**Text Books**

1. G. N. Tiwari and M. K. Ghosal, "Renewable Energy Resources: Basic Principle and Application", Alpha Science International Ltd, New Edition, 2005.
2. B. H. Khan, "Non-Conventional Energy Resources", Tata McGraw Hill, 2<sup>nd</sup> Edition, 2009.
3. R. Loulou, P. R. Shukla and A. Kanudia, "Energy and Environment Policies for a sustainable Future", Allied Publishers Ltd, New Delhi, 1997.

**Reference Books**

1. Solanki Chetan Singh, "Solar Photovoltaic - Fundamentals, Technologies and Applications", PHI, New Delhi, 3<sup>rd</sup> Edition, 2015.
2. Mukund R Patel, "Wind and Solar Power Systems", CRC Press, New York, 2<sup>nd</sup> Edition, 2011.
3. D. P. Kothari, K. C Singal, Rakesh Ranjan, "Renewable Energy Sources and Emerging Technologies", PHI Learning Pvt. Ltd, New Delhi, 2<sup>nd</sup> Edition, 2013.
4. John Twidell and Tony Weir, "Renewable Energy Resources", Routledge publication, 3<sup>rd</sup> Edition, 2015.
5. Godfrey Boyle, "Renewable Energy: Power for a Sustainable Future", Oxford University Press, 3<sup>rd</sup> Edition, 2014.

6. A. K. Mukerjee and Nivedita Thakur, "Photovoltaic Systems: Analysis and Design", PHI Learning Private Limited, New Delhi, 2011.
7. Ali Keyhani, "Design of Smart Power Grid Renewable Energy Systems", Wiley Publication, 1<sup>st</sup> Edition, 2011.

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1. <https://nptel.ac.in/courses/103/107/103107157/>
2. [www.renewableenergyworld.com/rea/tech/home](http://www.renewableenergyworld.com/rea/tech/home)
3. [www.eschooltoday.com/energy/renewable-energy](http://www.eschooltoday.com/energy/renewable-energy)
4. <https://www.chetansinghsolanki.in/course.php>
5. <https://nptel.ac.in/courses/108/108/108108078/>

**COs/POs/PSOs Mapping**

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| 1   | 3                      | 2   | 2   | 3   | -   | -   | -   | -   | -   | -    | -    | 2    | 3                                | 2    | 2    |
| 2   | 3                      | 2   | 2   | 3   | -   | -   | -   | -   | -   | -    | -    | 2    | 3                                | 2    | 2    |
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| 4   | 3                      | 2   | 2   | 3   | -   | -   | -   | -   | -   | -    | -    | 2    | 3                                | 2    | 2    |
| 5   | 3                      | 2   | 2   | 3   | -   | -   | -   | -   | -   | -    | -    | 2    | 3                                | 2    | 2    |

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



**Course Objectives**

- 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**

(12 Hrs)

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**

(12 Hrs)

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**

(12 Hrs)

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**

(12 Hrs)

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**

(12 Hrs)

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.

**Text Books**

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

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



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3. [https://pserc.wisc.edu/webinars/systems\\_webinars.aspx](https://pserc.wisc.edu/webinars/systems_webinars.aspx)
4. <https://www.classcentral.com/course/swayam-power-system-analysis-14243>

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| 3   | 3                     | 3   | 2   | 2   | 3   | -   | -   | -   | -   | -    | -    | 1    | 3                               | 2    | 2    |
| 4   | 3                     | 3   | 2   | 2   | 3   | -   | -   | -   | -   | -    | -    | 1    | 3                               | 2    | 2    |
| 5   | 3                     | 3   | 2   | 2   | 3   | -   | -   | -   | -   | -    | -    | 1    | 3                               | 2    | 2    |

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





**Course Objectives**

- To understand the purpose of energy storage systems.
- To learn the different energy storage techniques.
- To learn about the different types of batteries available for energy storage.
- To impart knowledge regarding on the advanced energy storage systems.
- To learn about the different vehicular energy storage schemes.

**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 storage 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)  
 CO5 - Analyze the various energy storage techniques used in Electric vehicles and its hybridization concepts, power grid stabilization, rail-system power models etc.(K4)

**UNIT I ENERGY STORAGE NEEDS**

(9 Hrs)

Energy Storage Need of energy storage - Different modes of Energy Storage - Potential energy - Pumped hydro storage - Kinetic Energy and Compressed gas system - Flywheel storage, compressed air energy storage - Environmental and sustainability issues.

**UNIT II ENERGY STORAGE TYPES**

(9 Hrs)

Electrical and Magnetic energy storage, Capacitors, electromagnets - Chemical Energy storage - Thermo-chemical, photo-chemical, bio-chemical, electro-chemical, fossil fuels and synthetic fuels - Hydrogen for energy storage, Solar Ponds for energy storage. Electrochemical Energy Storage Systems, Case study on perovskite solar cell.

**UNIT III BATTERIES**

(9 Hrs)

Batteries - Primary, Secondary, Lithium, Solid-state and molten solvent batteries - Lead acid batteries - Nickel Cadmium Batteries - Advanced Batteries - Role of carbon nano-tubes in electrodes - Flow battery operation - Flexible fiber battery- air batteries

**UNIT IV SUPERCONDUCTING MAGNET ENERGY STORAGE SYSTEMS**

(9 Hrs)

Superconducting Magnet Energy Storage(SMES) systems - Capacitor and Batteries: Comparison and application - Super capacitor - Electrochemical Double Layer Capacitor (EDLC), principle of working, structure, performance and application, role of activated carbon and carbon nano-tube - Super Capacitors - power calculation - operation and design.

**UNIT V VEHICULAR ENERGY STORAGE SYSTEMS**

(9 Hrs)

Energy storage technologies in hybrid vehicles – flywheel, hydraulic, fuel cell and hybrid fuel cell energy storage system – ultra capacitors – comparison – battery charging control

**Text Books**

1. JiuJun Zhang, Lei Zhang, Hansan Liu, Andy Sun, Ru-Shi Liu, "Electrochemical Technologies for Energy Storage and Conversion-2 Volume set", John Wiley and Sons, 1<sup>st</sup> Edition, 2011.
2. Detlef Stolten, "Hydrogen and Fuel Cells: Fundamentals, Technologies and Applications", Wiley, 1<sup>st</sup> Edition, 2010.
3. Robert Huggins, "Energy Storage: Fundamentals, Materials and Applications", Springer, 2<sup>nd</sup> Edition, 2016.
4. Andrei G. Ter-Gazarian, "Energy Storage for Power Systems", Institution of Engineering and Technology, 3<sup>rd</sup> Edition, 2020.

**Reference Books**

1. Francois Beguin and Elzbieta Frackowiak, "Super capacitors: Materials, Systems and Applications", Wiley-VCH, 1<sup>st</sup> Edition, 2013.
2. Doughty Liaw, Narayan and Srinivasan, "Batteries for Renewable Energy Storage", The Electrochemical Society, New Jersey, 2010.
3. Ali Emadi, Mehrdad Ehsani, John M. Miller, "Vehicular Electric Power Systems: Land, Sea, Air and Space Vehicles", CRC Press, 1<sup>st</sup> Edition, 2003.
4. Chris Mi, M. Abul Masrur, David Wenzhong Gao, "Hybrid Electric Vehicles: Principles and Applications with Practical Perspectives", Wiley, 1<sup>st</sup> Edition, 2011.

**Web References**

1. <https://www.azocleantech.com/article.aspx?ArticleID=593>
2. <https://energystorage.org/why-energy-storage/technologies/>
3. <https://www.renewableenergyworld.com/2019/10/22/which-new-energy-storage-technologies-might-outcompete-lithium-ion-in-the-2020s/>
4. <https://www.sciencedirect.com/topics/engineering/energy-storage-technology>
5. [https://en.wikipedia.org/wiki/Energy\\_storage](https://en.wikipedia.org/wiki/Energy_storage)
6. <https://www.energy.gov/oe/activities/technology-development/energy-storage>

**COs/POs/PSOs Mapping**

| 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   | 1   | -   | -   | -   | -   | -    | -    | -    | 3                                | 3    | 3    |
| 2   | 3                      | 3   | -   | 2   | 1   | -   | -   | -   | -   | -    | -    | -    | 3                                | 3    | 3    |
| 3   | 3                      | 3   | 3   | 2   | 1   | -   | -   | -   | -   | -    | -    | -    | 3                                | 3    | 3    |
| 4   | 3                      | 3   | 3   | 2   | 1   | -   | -   | -   | -   | -    | -    | -    | 3                                | 3    | 3    |
| 5   | 3                      | 3   | 3   | 2   | 1   | -   | -   | -   | -   | -    | -    | -    | 3                                | 3    | 3    |

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



## Annexure – III

### Academic calendar (IV Year)

|   |                                  |                                     |
|---|----------------------------------|-------------------------------------|
| <b>Use of Cell Phones</b>   |                                  |                                     |
| <p>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.</p>   |                                  |                                     |
| <b>Dress Code</b>   |                                  |                                     |
| <p>The students are requested to attend the college neatly dressed. While the male students should attend the college with the shirts neatly tucked in and with the shoes, the female students are permitted to come with chudidar and dupatta properly pinned. 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 uniform for the lab. The students are requested to strictly adhere to the dress codes as well as the rules and regulations of the college.</p> |                                  |                                     |
| <b>Maintenance of Discipline</b>  |                                  |                                     |
| <p>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.</p>  |                                  |                                     |
| <b>Online class</b>   | <b>Working hours</b>             | <b>Regular class</b>                |
| I hour 09.30 a.m to 10.20 a.m   | I hour 09.00 a.m to 09.50 a.m    | I hour 09.00 a.m to 09.50 a.m       |
| Break 10.20 a.m to 10.30 a.m  | II hour 09.50 a.m to 10.40 a.m   | II hour 10.40 a.m to 10.55 a.m      |
| II hour 10.30 a.m to 11.20 a.m  | Break 10.40 a.m to 10.55 a.m     | III hour 10.55 a.m to 11.45 a.m     |
| Break 11.20 a.m to 11.30 a.m  | III hour 10.55 a.m to 11.45 a.m  | IV hour 11.45 a.m to 12.35 p.m      |
| III hour 11.30 a.m to 12.20 p.m   | IV hour 11.45 a.m to 12.35 p.m   | V hour 01.15 p.m to 02.05 p.m       |
| IV hour 01.30 p.m to 02.20 p.m  | V hour 01.15 p.m to 02.05 p.m    | VI hour 02.05 p.m to 02.55 p.m      |
| Break 02.20 p.m to 02.30 p.m  | VI hour 02.05 p.m to 02.55 p.m   | VII hour 2.55 p.m to 03.45 p.m      |
| V hour 02.30 p.m to 03.20 p.m   | VII hour 2.55 p.m to 03.45 p.m   | VIII hour 03.40 p.m to 04.35 p.m    |
| Break 03.20 p.m to 03.30 p.m  | VIII hour 03.40 p.m to 04.35 p.m | Lunch break 12.55 p.m. to 1.15 p.m. |
| VI hour 03.30 p.m to 04.20 p.m  |                                  |                                     |
| Lunch break 12.20 p.m. to 1.40 p.m.   |                                  |                                     |

## SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

An Autonomous Institution  
(Accredited by NBA, AICTE, New Delhi, NAAC with 'A' Grade)

Madagadipet, Puducherry - 605 107

### Academic Calendar

January 2022 to May 2022

|              |                  |
|--------------|------------------|
| Name :       |                  |
| Programme :  | B.Tech           |
| Department : |                  |
| Year / Sem : | IV Yr / VIII Sem |

வினாயகர் பண்புகள், அறிவுகளை மேம்படுத்தும் கல்வி  
 கல்விக்கான அடிப்படை, அறிவு, திறன், தனித்துவம், நேர்மையான  
 உணர்வுகள், நேர்மையான, உயர் தரத்துக்கான கல்விக்கான  
 உணர்வுகளை மேம்படுத்தும், வினாயகர் பண்புகள், அறிவுகளை  
 மேம்படுத்தும், உயர் தரத்துக்கான கல்விக்கான  
 உணர்வுகளை மேம்படுத்தும், உயர் தரத்துக்கான கல்விக்கான  
 உணர்வுகளை மேம்படுத்தும், உயர் தரத்துக்கான கல்விக்கான  
 உணர்வுகளை மேம்படுத்தும், உயர் தரத்துக்கான கல்விக்கான  
 உணர்வுகளை மேம்படுத்தும், உயர் தரத்துக்கான கல்விக்கான  
 உணர்வுகளை மேம்படுத்தும், உயர் தரத்துக்கான கல்விக்கான  
 உணர்வுகளை மேம்படுத்தும், உயர் தரத்துக்கான கல்விக்கான

*(Signature)*  
 உறுதிப்படுத்தும், உயர் தரத்துக்கான கல்விக்கான

|  |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
|--|----------------------------|--------------------------------------|----------------------------|--|------------|--|----------|--|------------|---|----------|--|----------|
| <b>About Autonomization</b>  |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <p>Sri Manakula Vinayagar Engineering College has been conferred with Autonomous Status by the University Grants Commission on 26<sup>th</sup> September 2019 and the same was approved by Pondicherry University on 19<sup>th</sup> June 2020. The Pondicherry University Regulations R2013 is followed for the students admitted in the Academic Year 2018 -19 (present Final year).</p>   |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <p>End semester examinations process i.e., question paper setting, answer script evaluation and result will be published by SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE.</p>  |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <b>Punctuality in Attendance</b>   |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <p>The students are requested to keep up punctuality in attending the college. The late 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 shall 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.</p>  |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <b>Repeating the Course</b>  |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <p>A student who secures over all attendance which is less than 60% has to repeat the course with the approval of the University when it is next offered.</p>  |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <b>Tutor Ward System</b>   |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <p>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.</p>  |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <b>Continuous Assessment Marks for Theory : 25 Marks</b>   |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <p>25 marks are allotted for continuous assessment for a theory paper. Out of 25 marks 20 marks are awarded for the continuous assessment tests based on the performance of the student in the C.A.T-I, II &amp; Model exam and the remaining five marks are awarded for class attendance. The distribution of 5 marks for class attendance and the details of distribution of 25 marks for continuous assessment are as follows:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">5 marks for 95% attendance and above</td> <td style="width: 50%;">Best Two out of three test</td> </tr> <tr> <td>4 marks for 90% attendance and above but below 95%</td> <td>CAT I &amp; II</td> </tr> <tr> <td>3 marks for 85% attendance and above but below 90%</td> <td>&amp; Model</td> </tr> <tr> <td>2 marks for 80% attendance and above but below 85%</td> <td>Attendance</td> </tr> <tr> <td>1 mark for 75% attendance and above but below 80%</td> <td>Total</td> </tr> <tr> <td></td> <td style="text-align: right;">25 marks</td> </tr> </table> |                            | 5 marks for 95% attendance and above | Best Two out of three test | 4 marks for 90% attendance and above but below 95% | CAT I & II | 3 marks for 85% attendance and above but below 90%       | & Model  | 2 marks for 80% attendance and above but below 85%     | Attendance | 1 mark for 75% attendance and above but below 80% | Total    |  | 25 marks |
| 5 marks for 95% attendance and above   | Best Two out of three test |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| 4 marks for 90% attendance and above but below 95%   | CAT I & II                 |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| 3 marks for 85% attendance and above but below 90%   | & Model                    |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| 2 marks for 80% attendance and above but below 85%   | Attendance                 |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| 1 mark for 75% attendance and above but below 80%  | Total                      |                                      |                            |  |            |  |          |  |            |   |          |  |          |
|  | 25 marks                   |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <b>Continuous Assessment Marks for Practical : 50 Marks</b>  |                            |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| <p>For a practical subject, when there is a end semester examination, 50 marks for external examination and 50 marks for continuous assessment are allocated. The distribution of 50 marks for Continuous assessment is as follows:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">For practical class attendance</td> <td style="width: 50%;">10 marks</td> </tr> <tr> <td>For Model Exam Report</td> <td>15 marks</td> </tr> <tr> <td>For average of marks for experiment report for each exp.</td> <td>15 marks</td> </tr> <tr> <td>For average of Pre- post-test viva for each experiment</td> <td>10 marks</td> </tr> <tr> <td style="text-align: right;">Total</td> <td>50 marks</td> </tr> </table>   |                            | For practical class attendance       | 10 marks                   | For Model Exam Report                              | 15 marks   | For average of marks for experiment report for each exp. | 15 marks | For average of Pre- post-test viva for each experiment | 10 marks   | Total   | 50 marks |  |          |
| For practical class attendance   | 10 marks                   |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| For Model Exam Report  | 15 marks                   |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| For average of marks for experiment report for each exp.   | 15 marks                   |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| For average of Pre- post-test viva for each experiment   | 10 marks                   |                                      |                            |  |            |  |          |  |            |   |          |  |          |
| Total  | 50 marks                   |                                      |                            |  |            |  |          |  |            |   |          |  |          |

**Wi-Fi Campus**

Our campus has been enabled by high speed uninterrupted Wi-Fi connectivity. The Computer Centre is open till 8.00 p.m. on all the working days except on the dates of University examinations.

**Library Working Hours**

8.30 a.m. to 8.30 p.m. (On all the working days)  
8.30 a.m. to 10.00 p.m. (During the examination days)

**Women Cell**

For the benefit of the girl students, a Women 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 grievance. Mail ID : grievance@sunvee.ac.in

**Importance of Continuous Assessment Marks(CAM)**

The continuous assessment marks once earned are carried over to the subsequent semester. Hence the students are requested to work hard to get the maximum continuous assessment marks. If the continuous 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 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 meet organized by the recognized institutions, then the management of this institution will also sanction an amount equivalent to the winning award / cash prize 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**

61 buses have been arranged for the students to reach the college from Pudukkottai, Manakulam, Thoduvanam, Villupuram, Neyveli, Panruti, Cuddalore, Nellikuppam, etc. Separate transport facility has been arranged for the students who remain in the college after 3 p.m. for utilizing computer lab, library and sports facilities. The students are requested to utilize the transport facility. All the students are requested to avoid mobile phones and travel by two wheelers considering their safety and security.

**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 90% attendance and above but below 95%  
6 marks for 85% 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, assignment 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.

**June 2022**

| Date                             | Day | Schedule | Working day/<br>Holiday |
|----------------------------------|-----|----------|-------------------------|
| 1                                | Wed |          |                         |
| 2                                | Thu |          |                         |
| 3                                | Fri |          |                         |
| 4                                | Sat |          |                         |
| 5                                | Sun |          | Holiday                 |
| 6                                | Mon |          |                         |
| 7                                | Tue |          |                         |
| 8                                | Wed |          |                         |
| 9                                | Thu |          |                         |
| 10                               | Fri |          |                         |
| 11                               | Sat |          |                         |
| 12                               | Sun |          | Holiday                 |
| 13                               | Mon |          |                         |
| 14                               | Tue |          |                         |
| 15                               | Wed |          |                         |
| 16                               | Thu |          |                         |
| 17                               | Fri |          |                         |
| 18                               | Sat |          |                         |
| 19                               | Sun |          | Holiday                 |
| 20                               | Mon |          |                         |
| 21                               | Tue |          |                         |
| 22                               | Wed |          |                         |
| 23                               | Thu |          |                         |
| 24                               | Fri |          |                         |
| 25                               | Sat |          |                         |
| 26                               | Sun |          | Holiday                 |
| 27                               | Mon |          |                         |
| 28                               | Tue |          |                         |
| 29                               | Wed |          |                         |
| 30                               | Thu |          |                         |
| Total number of working days : - |     |          |                         |
| Total number of holiday : -      |     |          |                         |

பி. சாந்திரசேகரன், மாண்பு மருத்துவப் பேராசிரியர், கலா அமைச்சர் பதவி வகை - இயக்குநர்

| May 2022 |     |          |                       |
|----------|-----|----------|-----------------------|
| Date     | Day | Schedule | Working day / Holiday |
| 01       | Fri |          | Working               |
| 02       | Sat |          | Holiday               |
| 03       | Sun |          | Holiday               |
| 04       | Mon |          | Working               |
| 05       | Tue |          | Working               |
| 06       | Wed |          | Working               |
| 07       | Thu |          | Working               |
| 08       | Fri |          | Working               |
| 09       | Sat |          | Holiday               |
| 10       | Sun |          | Holiday               |
| 11       | Mon |          | Working               |
| 12       | Tue |          | Working               |
| 13       | Wed |          | Working               |
| 14       | Thu |          | Working               |
| 15       | Fri |          | Working               |
| 16       | Sat |          | Holiday               |
| 17       | Sun |          | Holiday               |
| 18       | Mon |          | Working               |
| 19       | Tue |          | Working               |
| 20       | Wed |          | Working               |
| 21       | Thu |          | Working               |
| 22       | Fri |          | Working               |
| 23       | Sat |          | Holiday               |
| 24       | Sun |          | Holiday               |
| 25       | Mon |          | Working               |
| 26       | Tue |          | Working               |
| 27       | Wed |          | Working               |
| 28       | Thu |          | Working               |
| 29       | Fri |          | Working               |
| 30       | Sat |          | Holiday               |
| 31       | Sun |          | Holiday               |

Total number of working days : -  
Total number of holiday : -

**Placement and Training Division**

The placement cell functions round the clock throughout the year to establish contact with reputed multinational companies, well established industrial organisations and places an emphasis on job in becoming various job opportunities and placing large number of the students every year at these organisations.

**Activities of the Training Division**

1. Arranges visitings for personality and interpersonal skill development
2. Assure the students to get in plant training
3. Arrange industrial visits
4. Creates awareness on the opportunities open for higher studies
5. Arrange coaching classes for GATE, GRE, TOEFL, IELTS, IAS, IES etc.

**Placement Record**

| Academic Year   | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 |
|-----------------|---------|---------|---------|---------|---------|---------|---------|
| Students Placed | 87%     | 87%     | 87%     | 87%     | 87%     | 87%     | 87%     |

**Details of Placed Students - 2021-22**

|                         |    |                     |     |
|-------------------------|----|---------------------|-----|
| KAAR Technologies       | 27 | Am (Chd)            | 1   |
| Airtel                  | 14 | Chemical Technology | 0   |
| NSIC                    | 11 | Tata Motors         | 1   |
| US                      | 14 | Teledcom            | 1   |
| Univis                  | 11 | BenLab Instrument   | 2   |
| CTS                     | 23 | Trivison            | 2   |
| Zeon                    | 1  | Uthmaniyah          | 3   |
| Infosys                 | 1  | Michela India       | 20  |
| Evon                    | 1  | USS                 | 1   |
| Wipro                   | 15 | Advaat Golf         | 1   |
| Mangana                 | 40 | Shri Sai Techno     | 4   |
| DataMatrix              | 2  | Accenture           | 1   |
| Master Key Technologies | 7  | MST KZhou           | 18  |
| Dyco                    | 2  | Shri Sai Academy    | 17  |
| Secure Cloud            | 6  | SAI/Inf             | 1   |
| Support Studio          | 1  | RIS Market          | 1   |
| Capgemini               | 6  | Koost Technology    | 2   |
| Tata                    | 1  |                     |     |
| Hewlett                 | 3  |                     |     |
| Mindtree                | 2  |                     |     |
| ITC                     | 3  | Total               | 948 |

\* till February 2022

**Gold Medal and Top Ten Ranks**

Your seniors were sincere, hard working and got the Gold medal of the Pondicherry 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 CGPA received from 1<sup>st</sup> to 10<sup>th</sup> semester shall be considered and it is mandatory that the candidate should have passed all the subjects from 1<sup>st</sup> to 10<sup>th</sup> semesters in the first attempt. Rank certificates would be issued to the first five candidates in each branch of study.)*

| Name of the Course | Year                       |      |                             |
|--------------------|----------------------------|------|-----------------------------|
|                    | 2017                       | 2018 | 2019                        |
| B.Tech. ECE        | 2, 4, 6, 7                 |      | 2, 3, 4, 6, 7, 8, 9, 10     |
| B.Tech. ECE        | 2, 3, 4, 5, 6, 7, 8, 9, 10 |      | 3, 4, 5, 6, 7, 8, 10        |
| B.Tech. CE         | 2, 3, 4, 10                |      | 2, 4, 6, 7, 8, 10           |
| B.Tech. E          | 2, 3, 4, 5, 6, 7, 8, 9, 10 |      | 2, 3, 4, 5, 6, 8            |
| B.Tech. EE         | 2, 3, 4, 5, 6, 7, 8, 9, 10 |      | 2, 3, 4, 5, 6, 7, 8, 9, 10  |
| B.Tech. Mech       | 4, 5, 7, 8, 10             |      | 3, 7, 8, 10                 |
| B.Tech. CSE        | 2, 3, 10                   |      | 2, 3, 4, 6, 7, 10           |
| MCA                | 3, 4, 7, 8, 10             |      | 2, 3, 4, 5, 6, 7, 8, 10, 11 |
| MBA                | 3, 4, 6, 7, 8              |      | 2, 3, 4, 5, 6, 7, 8, 10     |
| M.Tech. CE         | 2, 3, 4, 5, 7, 8, 9        |      | 7                           |
| M.Tech. ECE        | 2, 3, 4, 7, 8, 9           |      | 2, 3, 4, 5                  |
| M.Tech. EE         |                            |      | 2, 3                        |
| M.Tech. EEE        | 2, 3, 4, 5, 7, 8, 9        |      | 2, 3                        |
| M.Tech. MS         |                            |      | 2, 3, 4                     |
| M.Tech. ME         | 2                          |      |                             |

**April 2022**

| Date | Day | Schedule  | Working day / Holiday |
|------|-----|---|-----------------------|
| 1    | Fri |   | 58                    |
| 2    | Sat |   | 58                    |
| 3    | Sun |   | Holiday               |
| 4    | Mon |   | 60                    |
| 5    | Tue | Feedback from the students & Analysis           | 61                    |
| 6    | Wed | OCCM meeting-3                                  | 62                    |
| 7    | Thu |   | 63                    |
| 8    | Fri |   | 64                    |
| 9    | Sat |   | 65                    |
| 10   | Sun |   | Holiday               |
| 11   | Mon | Model for IV Year (3 units)                     | 66                    |
| 12   | Tue |   | 67                    |
| 13   | Wed |   | 68                    |
| 14   | Thu | Tamil New Year                                  | Holiday               |
| 15   | Fri | Good Friday                                     | Holiday               |
| 16   | Sat |   | 69                    |
| 17   | Sun |   | Holiday               |
| 18   | Mon |   | 70                    |
| 19   | Tue |   | 71                    |
| 20   | Wed |   | 72                    |
| 21   | Thu |   | 73                    |
| 22   | Fri | Model Result Analysis & Report Submission       | 74                    |
| 23   | Sat | Submission of Attendance & Assessment - Term II | 75                    |
| 24   | Sun |   | Holiday               |
| 25   | Mon | Termive End Semester Examination starts         |                       |
| 26   | Tue |   |                       |
| 27   | Wed |   |                       |
| 28   | Thu |   |                       |
| 29   | Fri |   |                       |
| 30   | Sat |   |                       |

Total number of working days : 17  
Total number of holiday : 7

| March 2022 |     |   | Working day |
|------------|-----|---|-------------|
| Date       | Day | Schedule  | Holiday     |
| 1          | Tue |   | 31          |
| 2          | Wed | Phase II Second review                          | 32          |
| 3          | Thu |   | 33          |
| 4          | Fri |   | 34          |
| 5          | Sat |   | 35          |
| 6          | Sun |   | Holiday     |
| 7          | Mon |   | 36          |
| 8          | Tue | Feedback from the students & Analysis           | 37          |
| 9          | Wed | OCM meeting - 2                                 | 38          |
| 10         | Thu |   | 39          |
| 11         | Fri |   | 40          |
| 12         | Sat |   | 41          |
| 13         | Sun |   | Holiday     |
| 14         | Mon | CAT-II for IV Year (1 1/2 units)                | 42          |
| 15         | Tue |   | 43          |
| 16         | Wed |   | 44          |
| 17         | Thu |   | 45          |
| 18         | Fri |   | 46          |
| 19         | Sat |   | 47          |
| 20         | Sun |   | Holiday     |
| 21         | Mon | CAT-II Result Analysis & Report Submission      | 48          |
| 22         | Tue | Submission of Attendance & Assessment - Term II | 49          |
| 23         | Wed | Final Project Review                            | 50          |
| 24         | Thu |   | 51          |
| 25         | Fri |   | 52          |
| 26         | Sat |   | 53          |
| 27         | Sun |   | Holiday     |
| 28         | Mon |   | 54          |
| 29         | Tue |   | 55          |
| 30         | Wed |   | 56          |
| 31         | Thu |   | 57          |

Total number of working days : 27  
Total number of holiday : 04

ശ്യാമപ്രസാദ് കൃഷ്ണൻ മെമ്മോറിയൽ എഞ്ചിനീയറിംഗ് കോളേജ്, തൃശ്ശൂർ  
എസ്.എസ്.ടി. കോളേജ്, തൃശ്ശൂർ

**Important points for the kind attention of the Parents**

Dear Parent

The VIII semester classes commences on 24<sup>th</sup> January 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.

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.

| January 2022 |     |                                       | Working day |
|--------------|-----|---------------------------------------|-------------|
| Date         | Day | Schedule                              | Holiday     |
| 1            | Sat | New Year                              | Holiday     |
| 2            | Sun |                                       | Holiday     |
| 3            | Mon |                                       |             |
| 4            | Tue |                                       |             |
| 5            | Wed |                                       |             |
| 6            | Thu |                                       |             |
| 7            | Fri |                                       |             |
| 8            | Sat |                                       |             |
| 9            | Sun |                                       | Holiday     |
| 10           | Mon |                                       |             |
| 11           | Tue |                                       |             |
| 12           | Wed |                                       |             |
| 13           | Thu | Bogi Festival                         | Holiday     |
| 14           | Fri | pongal                                | Holiday     |
| 15           | Sat | Thiruvalluvar Day                     | Holiday     |
| 16           | Sun | Uzhavar Thiruna                       | Holiday     |
| 17           | Mon |                                       |             |
| 18           | Tue |                                       |             |
| 19           | Wed |                                       |             |
| 20           | Thu |                                       |             |
| 21           | Fri |                                       |             |
| 22           | Sat |                                       |             |
| 23           | Sun |                                       | Holiday     |
| 24           | Mon | Commencement of VIII semester classes | 1           |
| 25           | Tue |                                       | 2           |
| 26           | Wed | Republic day                          | Holiday     |
| 27           | Thu |                                       | 3           |
| 28           | Fri |                                       | 4           |
| 29           | Sat |                                       | 5           |
| 30           | Sun |                                       | Holiday     |
| 31           | Mon |                                       | 6           |

Total number of working days : 06  
Total number of holiday : 03

ശ്യാമപ്രസാദ് കൃഷ്ണൻ മെമ്മോറിയൽ എഞ്ചിനീയറിംഗ് കോളേജ്, തൃശ്ശൂർ  
എസ്.എസ്.ടി. കോളേജ്, തൃശ്ശൂർ

| February 2022 |     |  | Working day |
|---------------|-----|--|-------------|
| Date          | Day | Schedule                                       | Holiday     |
| 1             | Tue |  | 7           |
| 2             | Wed |  | 8           |
| 3             | Thu |  | 9           |
| 4             | Fri |  | 10          |
| 5             | Sat |  | 11          |
| 6             | Sun |  | Holiday     |
| 7             | Mon |  | 12          |
| 8             | Tue | Feedback from the students & Analysis          | 13          |
| 9             | Wed | OCM meeting - 1                                | 14          |
| 10            | Thu | Phase II First review                          | 15          |
| 11            | Fri |  | 16          |
| 12            | Sat |  | 17          |
| 13            | Sun |  | Holiday     |
| 14            | Mon | CAT-I for IV Year (1 1/2 units)                | 18          |
| 15            | Tue |  | 19          |
| 16            | Wed |  | 20          |
| 17            | Thu |  | 21          |
| 18            | Fri |  | 22          |
| 19            | Sat |  | 23          |
| 20            | Sun |  | Holiday     |
| 21            | Mon | CAT-I Result Analysis & Report Submission      | 24          |
| 22            | Tue |  | 25          |
| 23            | Wed | Submission of Attendance & Assessment - Term I | 26          |
| 24            | Thu |  | 27          |
| 25            | Fri |  | 28          |
| 26            | Sat |  | 29          |
| 27            | Sun |  | Holiday     |
| 28            | Mon |  | 30          |

Total number of working days : 24  
Total number of holiday : 04

ശ്യാമപ്രസാദ് കൃഷ്ണൻ മെമ്മോറിയൽ എഞ്ചിനീയറിംഗ് കോളേജ്, തൃശ്ശൂർ  
എസ്.എസ്.ടി. കോളേജ്, തൃശ്ശൂർ

# Academic calendar (III & 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 neatly dressed. While the male students should attend the college with the shirts neatly tucked in and with the shoes, the female students are permitted to come with chudidar and dupatta properly pinned. 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 lab. 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.

| Online class |                        | Working hours |                        | Regular class |                        |
|--------------|------------------------|---------------|------------------------|---------------|------------------------|
| I hour       | 09:30 a.m to 10:20 a.m | I hour        | 09:00 a.m to 09:50 a.m | I hour        | 09:00 a.m to 09:50 a.m |
| Break        | 10:20 a.m to 10:50 a.m | II hour       | 10:00 a.m to 10:40 a.m | Break         | 10:40 a.m to 10:55 a.m |
| II hour      | 10:50 a.m to 11:20 a.m | III hour      | 10:55 a.m to 11:45 a.m | II hour       | 10:55 a.m to 11:45 a.m |
| Break        | 11:20 a.m to 11:50 a.m | IV hour       | 11:45 a.m to 12:35 p.m | III hour      | 11:45 a.m to 12:35 p.m |
| III hour     | 11:50 a.m to 12:20 p.m | V hour        | 01:15 p.m to 02:05 p.m | IV hour       | 01:15 p.m to 02:05 p.m |
| IV hour      | 01:30 p.m to 02:20 p.m | VI hour       | 02:05 p.m to 02:55 p.m | V hour        | 02:05 p.m to 02:55 p.m |
| Break        | 02:20 p.m to 02:50 p.m | VII hour      | 2:55 p.m to 03:45 p.m  | VI hour       | 2:55 p.m to 03:45 p.m  |
| V hour       | 02:50 p.m to 03:20 p.m | VIII hour     | 03:40 p.m to 04:35 p.m | VII hour      | 03:40 p.m to 04:35 p.m |
| Break        | 03:20 p.m to 03:50 p.m |               |                        |               |                        |
| VI hour      | 03:50 p.m to 04:20 p.m |               |                        |               |                        |
| Lunch break  | 12:20 p.m to 1:40 p.m  | Lunch break   | 12:55 p.m to 1:15 p.m  |               |                        |

**SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE**  
 An Autonomous Institution  
 (Accredited by NBA/AICTE, New Delhi, NAAC with 'A' Grade)  
 Madagadipet, Puducherry - 605 107



**Academic Calendar**  
 January 2022 to May 2022

Name :  
 Programme : B.Tech  
 Department :  
 Year / Sem : II Yr / III Sem & III Yr / VI Sem

சென்னை மாநகராட்சி, கட்டிடக்கலை அமைச்சுக்கு உட்பட்ட  
 பொது நல அமைச்சு, மதுரை மாவட்டம், மதுரை நகராட்சி  
 கட்டிடக்கலை அமைச்சு, கட்டிடக்கலை அமைச்சு  
 கட்டிடக்கலை அமைச்சு, கட்டிடக்கலை அமைச்சு  
 கட்டிடக்கலை அமைச்சு, கட்டிடக்கலை அமைச்சு  
 கட்டிடக்கலை அமைச்சு, கட்டிடக்கலை அமைச்சு  
 கட்டிடக்கலை அமைச்சு, கட்டிடக்கலை அமைச்சு  
 கட்டிடக்கலை அமைச்சு, கட்டிடக்கலை அமைச்சு  
 கட்டிடக்கலை அமைச்சு, கட்டிடக்கலை அமைச்சு  
 கட்டிடக்கலை அமைச்சு, கட்டிடக்கலை அமைச்சு

**About Autonomous**

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

**SIGNIFICANCE OF SMVTEC AUTONOMOUS REGULATIONS 2019-2020 & CURRICULUM**

- Industry 4.0 ready curriculum
- Curriculum towards skill development and to create more job opportunities
- Multidisciplinary curriculum
- Oriented towards entrepreneurship 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 5<sup>th</sup> and 6<sup>th</sup> semester for the students having 2 marks
- Ethnotech / Mandatory course  
 The Institute has Established 1<sup>st</sup> Center of Excellence to provide 91 International Certification courses from IBM, Google, Cisco, e Plan, Microsoft, Autodesk, Texas Instruments, Festo, Bentley, Schneider Electric, Amazon web services, Siemens, Tally, DELL EMC, Harsco Technov, PTC, LN on Excellence in Technology & Didactic solutions. All students should enroll in certification course from semester-I to semester-VI.
- Industrial Training / Internship  
 Students may undergo training or internship during summer / winter vacation at Industry / Research organization. Students are also permitted to undergo internships during their eighth semester after the completion of theory classes.

**June 2022**

| Date | Day | Schedule | Working day / Holiday |
|------|-----|----------|-----------------------|
| 1    | Wed |          |                       |
| 2    | Thu |          |                       |
| 3    | Fri |          |                       |
| 4    | Sat |          |                       |
| 5    | Sun |          | Holiday               |
| 6    | Mon |          |                       |
| 7    | Tue |          |                       |
| 8    | Wed |          |                       |
| 9    | Thu |          |                       |
| 10   | Fri |          |                       |
| 11   | Sat |          |                       |
| 12   | Sun |          | Holiday               |
| 13   | Mon |          |                       |
| 14   | Tue |          |                       |
| 15   | Wed |          |                       |
| 16   | Thu |          |                       |
| 17   | Fri |          |                       |
| 18   | Sat |          |                       |
| 19   | Sun |          | Holiday               |
| 20   | Mon |          |                       |
| 21   | Tue |          |                       |
| 22   | Wed |          |                       |
| 23   | Thu |          |                       |
| 24   | Fri |          |                       |
| 25   | Sat |          |                       |
| 26   | Sun |          | Holiday               |
| 27   | Mon |          |                       |
| 28   | Tue |          |                       |
| 29   | Wed |          |                       |
| 30   | Thu |          |                       |

Total number of working days : -  
 Total number of holiday : -

| May 2022 |     |  |                       |
|----------|-----|--|-----------------------|
| Date     | Day | Schedule   | Working day / Holiday |
| 1        | Sun |  | Holiday               |
| 2        | Mon |  | 64                    |
| 3        | Tue | Ramzan   | Holiday               |
| 4        | Wed |  | 65                    |
| 5        | Thu |  | 66                    |
| 6        | Fri |  | 67                    |
| 7        | Sat |  | 68                    |
| 8        | Sun |  | Holiday               |
| 9        | Mon | Tentative End Semester Theory examination Starts |                       |
| 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 | Tentative Commencement of next semester classes  |                       |
| 26       | Thu |  |                       |
| 27       | Fri |  |                       |
| 28       | Sat |  | Holiday               |
| 29       | Sun |  |                       |
| 30       | Mon |  |                       |
| 31       | Tue |  |                       |

Total number of working days : 07  
Total number of holiday : 03

ഭൂമിശാസ്ത്രം, രാസം, ഫിസിക്സ്, ഇംഗ്ലീഷ്, കമ്പ്യൂട്ടർ ഗ്രാഫിക്സ് - ഭാഗം

◆ Supplementary Examinations

Supplementary examination is an additional examination conducted within a month of time after 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 first attempt will be considered.

Benefits

- ◆ More number of students will receive the degree within the stipulated time
- ◆ The industries prefer to recruit students with no standing arrears. 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 losing their attendance and in turn the internal marks. Hence all the students are requested to attend the college in time. A student shall 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.

Ratio 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.

Marks Distribution of Continuous Assessment Marks (CAM) and End Semester Examination Marks (ESM) Scheme for Continuous Assessment Test (CAT)

| S. No | Course Type  | Continuous Assessment components |   |                                  |                   |                   |            |            | Total |            |            |
|-------|--------------|----------------------------------|---|----------------------------------|-------------------|-------------------|------------|------------|-------|------------|------------|
|       |              | Test Marks                       | Average of pre-post test (10) for each unit for each semester | Assignment marks for each report | Model Exam Report | Assignment Report | Review - 1 | Review - 2 |       | Review - 3 | Attendance |
| 1     | Theory       | 15                               | -   | -                                | -                 | 5                 | -          | -          | -     | 5          | 25         |
| 2     | Practical    | -                                | 10  | 15                               | 15                | -                 | -          | -          | -     | 10         | 50         |
| 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 1/2 Units      | 50         | 1 1/2 hours      | 10                     |
| 2                                       | CAT 2 | 1 1/2 Units      | 50         | 1 1/2 hours      | 10                     |
| 3                                       | Model | 5 Units          | 75         | 3 hours          | 05                     |
| Continuous Assessment for Theory Course |       |                  |            |                  | 15                     |

Question Paper Pattern

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 Exam

| 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 semester Examination Question Pattern |                         |                          | 75          |

Table (b) Question paper pattern for End semester Examination(ESE)

| 2 Marks      | 5 Marks                                    | 10 Marks                          | Total Marks |
|--------------|--|-----------------------------------|-------------|
| 10(20 Marks) | 5 (25 Marks) (one question from each unit) | 3 (30 Marks) (out of 5 questions) | 75          |

April 2022

| Date | Day | Schedule  | Working day / Holiday |
|------|-----|---|-----------------------|
| 1    | Fri |   | Holiday               |
| 2    | Sat |   | 69                    |
| 3    | Sun |   | 70                    |
| 4    | Mon |   | Holiday               |
| 5    | Tue |   | 71                    |
| 6    | Wed | Assignment - III                                    | 72                    |
| 7    | Thu | Feedback from the students & Analysis               | 73                    |
| 8    | Fri | OCM meeting - 3                                     | 74                    |
| 9    | Sat |   | 75                    |
| 10   | Sun |   | Holiday               |
| 11   | Mon | Model for II, III Year (5 units)                    | 76                    |
| 12   | Tue |   | 77                    |
| 13   | Wed |   | 78                    |
| 14   | Thu | Tamil New Year                                      | Holiday               |
| 15   | Fri | Good Friday   | Holiday               |
| 16   | Sat |   | 79                    |
| 17   | Sun |   | 80                    |
| 18   | Mon |   | Holiday               |
| 19   | Tue |   | 81                    |
| 20   | Wed |   | 82                    |
| 21   | Thu | Last working day for II, III Year                   | 83                    |
| 22   | Fri | Model Result Analysis & Report Submission           | 84                    |
| 23   | Sat | Submission of Attendance & Assessment - Term II     | 85                    |
| 24   | Sun |   | Holiday               |
| 25   | Mon | Tentative End Semester practical examination starts | 86                    |
| 26   | Tue |   | 87                    |
| 27   | Wed |   | 88                    |
| 28   | Thu |   | 89                    |
| 29   | Fri |   | 90                    |
| 30   | Sat | Tentative End Semester practical examination ends   | 91                    |

Total number of working days : 24  
Total number of holiday : 6

ഭൂമിശാസ്ത്രം, രാസം, ഫിസിക്സ്, ഇംഗ്ലീഷ്, കമ്പ്യൂട്ടർ ഗ്രാഫിക്സ് - ഭാഗം



| March 2022 |     |   |                       |
|------------|-----|---|-----------------------|
| Date       | Day | Schedule  | Working day / Holiday |
| 1          | Tue |   | 33                    |
| 2          | Wed |   | 34                    |
| 3          | Thu |   | 35                    |
| 4          | Fri |   | 36                    |
| 5          | Sat |   | 37                    |
| 6          | Sun |   | Holiday               |
| 7          | Mon |   | 38                    |
| 8          | Tue |   | 39                    |
| 9          | Wed | Assignment - II                                 | 40                    |
| 10         | Thu | Feedback from the students & Analysis           | 41                    |
| 11         | Fri | OCM meeting - 2                                 | 42                    |
| 12         | Sat |   | 43                    |
| 13         | Sun |   | Holiday               |
| 14         | Mon | CAT-I for B. III Year (1 % units)               | 44                    |
| 15         | Tue |   | 45                    |
| 16         | Wed |   | 46                    |
| 17         | Thu |   | 47                    |
| 18         | Fri |   | 48                    |
| 19         | Sat |   | 49                    |
| 20         | Sun |   | Holiday               |
| 21         | Mon | CAT-II Result Analysis & Report Submission      | 50                    |
| 22         | Tue |   | 51                    |
| 23         | Wed | Submission of Attendance & Assessment - Term II | 52                    |
| 24         | Thu |   | 53                    |
| 25         | Fri |   | 54                    |
| 26         | Sat |   | 55                    |
| 27         | Sun |   | Holiday               |
| 28         | Mon |   | 56                    |
| 29         | Tue |   | 57                    |
| 30         | Wed |   | 58                    |
| 31         | Thu |   | 59                    |

Total number of working days : 27  
Total number of holiday : 04

കുറഞ്ഞ അടങ്കലുകൾ ഉണ്ടാകാതെ പരീക്ഷകൾക്ക് തയ്യാറെടുപ്പിക്കാനും പരീക്ഷകൾക്ക് പങ്കെടുക്കാനും ശ്രമിക്കേണ്ടതാണ്.

**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 90% attendance and above but below 95%  
 6 marks for 85% 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, assignment 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 benefit of the girl students, a Women 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 Chairperson / members to redress their grievances. Mail ID : grievance@stjose.ac.in

**Importance of Continuous Assessment Marks(CAM)**

The continuous assessment marks once earned are carried over to the subsequent exams also. Hence the students are requested to work hard to get the maximum continuous assessment marks. If the continuous 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 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 organized by the recognized institutions, then the management of this institution will also sanction an amount equivalent to the winning award / cash prize 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**

61 buses have been arranged for the students to reach the college from Pudukkottai, Kanagacherry, Villupuram, Neyveli, Panruti, Cuddalore, Nellikuppam, Madukkam, Thuduvannur, Tiruvannamalai and Villupattanam covering almost all the areas. Separate transport facility has been arranged for the students who remain in the college after 5 p.m. for utilizing computer lab, library and sports facilities. The students are requested to utilize the transport facility.  
 All the students are requested to avoid mobile phones and travel by two wheels considering their safety and security.

| February 2022 |     |  |                       |
|---------------|-----|--|-----------------------|
| Date          | Day | Schedule                                       | Working day / Holiday |
| 1             | Tue |  | 9                     |
| 2             | Wed |  | 10                    |
| 3             | Thu |  | 11                    |
| 4             | Fri |  | 12                    |
| 5             | Sat |  | 13                    |
| 6             | Sun |  | Holiday               |
| 7             | Mon |  | 14                    |
| 8             | Tue |  | 15                    |
| 9             | Wed | Assignment - I                                 | 16                    |
| 10            | Thu | Feedback from the students & Analysis          | 17                    |
| 11            | Fri | OCM meeting - 1                                | 18                    |
| 12            | Sat |  | 19                    |
| 13            | Sun |  | Holiday               |
| 14            | Mon | CAT-I for B. III Year (1 % units)              | 20                    |
| 15            | Tue |  | 21                    |
| 16            | Wed |  | 22                    |
| 17            | Thu |  | 23                    |
| 18            | Fri |  | 24                    |
| 19            | Sat |  | 25                    |
| 20            | Sun |  | Holiday               |
| 21            | Mon | CAT-I Result Analysis & Report Submission      | 26                    |
| 22            | Tue |  | 27                    |
| 23            | Wed | Submission of Attendance & Assessment - Term I | 28                    |
| 24            | Thu |  | 29                    |
| 25            | Fri |  | 30                    |
| 26            | Sat |  | 31                    |
| 27            | Sun |  | Holiday               |
| 28            | Mon |  | 32                    |

Total number of working days : 24  
Total number of holiday : 04

കുറഞ്ഞ അടങ്കലുകൾ ഉണ്ടാകാതെ പരീക്ഷകൾക്ക് തയ്യാറെടുപ്പിക്കാനും പരീക്ഷകൾക്ക് പങ്കെടുക്കാനും ശ്രമിക്കേണ്ടതാണ്.

| January 2022 |     |   |                       |
|--------------|-----|---|-----------------------|
| Date         | Day | Schedule                                  | Working day / Holiday |
| 1            | Sat | New Year                                  | Holiday               |
| 2            | Sun |   | Holiday               |
| 3            | Mon |   |                       |
| 4            | Tue |   |                       |
| 5            | Wed |   |                       |
| 6            | Thu |   |                       |
| 7            | Fri |   |                       |
| 8            | Sat |   |                       |
| 9            | Sun |   | Holiday               |
| 10           | Mon |   |                       |
| 11           | Tue |   |                       |
| 12           | Wed |   |                       |
| 13           | Thu | Bogi Festival                             | Holiday               |
| 14           | Fri | Pongal                                    | Holiday               |
| 15           | Sat | Thiruvalluvar Day                         | Holiday               |
| 16           | Sun | Uzhaivar Thiruv                           | Holiday               |
| 17           | Mon |   |                       |
| 18           | Tue |   |                       |
| 19           | Wed |   |                       |
| 20           | Thu |   |                       |
| 21           | Fri | Commencement of III & VI semester classes | 1                     |
| 22           | Sat |   | 2                     |
| 23           | Sun |   | Holiday               |
| 24           | Mon |   | 3                     |
| 25           | Tue |   | 4                     |
| 26           | Wed | Republic day                              | Holiday               |
| 27           | Thu |   | 5                     |
| 28           | Fri |   | 6                     |
| 29           | Sat |   | 7                     |
| 30           | Sun |   | Holiday               |
| 31           | Mon |   | 8                     |

Total number of working days : 08  
Total number of holiday : 03

**Placement and Training Division**

The placement cell functions round the clock throughout the year to establish contact with reputed multinational companies, well established industrial organizations and plays an important role in locating various job opportunities and placing large number of the students every year at these organizations.

**Activities of the Training Division**

- Arranges trainings for personality and interpersonal skill development
- Assists the students to get in-plant training
- Arranges industrial visits
- Creates awareness on the opportunities open for higher studies
- Arranges coaching classes for GATE, GRE, TOEFL, IELTS, IAS, IES etc.

| Placement Record |                 | Details of Placed Students : 2011-22 |          |
|------------------|-----------------|--------------------------------------|----------|
| Academic Year    | Students Placed | Company                              | Students |
| 2013-14          | 85%             | KAAAR Technologies                   | 27       |
|                  |                 | Ami Onlin                            | 3        |
|                  |                 | Uvras                                | 34       |
|                  |                 | Chandrasekhar Technologies           | 6        |
|                  |                 | ZOHO                                 | 18       |
|                  |                 | Info Motors                          | 1        |
| 2014-15          | 95%             | ICS                                  | 17       |
|                  |                 | Enduser                              | 1        |
| 2015-16          | 95%             | Univsys                              | 11       |
|                  |                 | Bent Lab Instrument                  | 2        |
| 2016-17          | 95%             | CTS                                  | 23       |
|                  |                 | Electra                              | 5        |
| 2017-18          | 95%             | Zuca                                 | 1        |
|                  |                 | Unizcal                              | 5        |
|                  |                 | Entech                               | 1        |
|                  |                 | Muhimbi India                        | 20       |
| 2018-19          | 95%             | Egon                                 | 1        |
|                  |                 | GSS                                  | 3        |
| 2019-20          | 95%             | Wipro                                | 124      |
|                  |                 | Akshar Staff                         | 1        |
| 2020-21          | 96%             | Magma                                | 40       |
|                  |                 | Sisak Infotech                       | 6        |
|                  |                 | DataMatrix                           | 2        |
|                  |                 | Accenture                            | 1        |
|                  |                 | Microp Technology                    | 1        |
|                  |                 | MST Rethor                           | 18       |
|                  |                 | Opko                                 | 7        |
|                  |                 | Skolar Academy                       | 13       |
|                  |                 | Secura Cloud                         | 6        |
|                  |                 | ANZ Bank                             | 1        |
|                  |                 | Support Studio                       | 4        |
|                  |                 | IBMarket                             | 1        |
|                  |                 | Copertini                            | 6        |
|                  |                 | Kover Technology                     | 2        |
|                  |                 | Enso                                 | 4        |
|                  |                 | Herman                               | 1        |
|                  |                 | Mindtree                             | 3        |
|                  |                 | IEL                                  | 5        |
|                  |                 | Total                                | 745      |

**Wi-Fi Campus** \* till February 2022

Our campus has been enabled by high speed uninterrupted Wi-Fi connectivity. The Computer Centre is open till 8:00 p.m. on all the working days except on the dates of University examinations.

**Library Working Hours**

8.30 a.m. to 8.30 p.m. (On all the working days)  
8.30 a.m. to 10.00 p.m. (During the examination days)

**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 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 score from 1<sup>st</sup> to 8<sup>th</sup> semester alone should be considered and it is mandatory that the candidate should have passed all the subjects from 1<sup>st</sup> to 8<sup>th</sup> semester in the first attempt. Rank certification would be issued to the first five candidates in each branch of study.

| Name of the Course | Year                         |      |                              |
|--------------------|------------------------------|------|------------------------------|
|                    | 2017                         | 2018 | 2019                         |
| B.Tech EEE         | 2, 4, 6, 7                   | ☉    | ☉ 2, 3, 4, 6, 7, 8, 9, 10    |
| B.Tech ECE         | 2, 3, 4, 5, 6, 7, 8, 9, 10   |      | ☉ 3, 4, 5, 6, 7, 9, 10       |
| B.Tech CSE         | ☉ 2, 3, 4, 10                |      | ☉ 2, 4, 6, 7, 8, 10          |
| B.Tech IT          | ☉ 2, 3, 4, 5, 6, 7, 8, 9, 10 | ☉    | ☉ 2, 3, 5, 6, 8              |
| B.Tech EE          | ☉ 2, 3, 4, 5, 6, 7, 8, 9, 10 | ☉    | ☉ 2, 3, 4, 5, 6, 7, 8, 9, 10 |
| B.Tech Mech        | ☉ 4, 5, 7, 9, 10             |      | 3, 7, 8, 10                  |
| B.Tech Civil       | 2, 3, 10                     |      | 2, 3, 4, 6, 7, 10            |
| MCA                | 1, 4, 7, 9, 10               | ☉    | ☉ 2, 6, 7, 9, 10, 11         |
| MBA                | ☉ 3, 4, 6, 7, 8              |      | ☉ 2, 3, 4, 5, 7, 8, 10       |
| M.Tech CSE         | ☉ 2, 3, 4, 5, 7, 8, 9        |      | ☉ 7                          |
| M.Tech ECE         | 2, 3, 6, 7, 8, 9             |      | 3, 3, 4, 5                   |
| M.Tech PED         | ☉                            |      | ☉ 2, 3                       |
| M.Tech NPV         | ☉ 2, 3, 4, 5, 7, 8, 9        |      | ☉ 2, 3                       |
| M.Tech M.S.D       | ☉                            |      | ☉ 2, 3, 4                    |
| M.Tech (M)         | ☉ 2                          |      | ☉                            |

**Important points for the kind attention of the Parents**

Dear Parent

The III and VI semester classes commences on 21<sup>st</sup> January 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 perturb their wards to avoid frequent leave during this semester period for the following reasons.

**III Semester (II Year) & VI Semester (III Year)** : All the III & VI 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 advise 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.

## Academic calendar (1 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 neatly dressed. While the male students should attend the college with the shirts neatly tucked in and with the shoes, the female students are permitted to come with churidar and dignita properly pinned. 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.

| Online class                      | Working hours                    | Regular class |
|-----------------------------------|----------------------------------|---------------|
| I hour 09.30 a.m to 10.25 a.m     | I hour 8.45 a.m to 09.35 a.m     |               |
| Break 10.25 a.m to 10.30 a.m      | II hour 09.35 a.m to 10.25 a.m   |               |
| II hour 10.30 a.m to 11.25 a.m    | III hour 10.25 a.m to 11.15 a.m  |               |
| Break 11.25 a.m to 11.30 p.m      | Break 11.15 a.m to 11.35 a.m     |               |
| III hour 11.30 a.m to 12.25 p.m   | IV hour 11.35 a.m to 12.25 p.m   |               |
| IV hour 01.30 p.m to 02.25 p.m    | V hour 12.25 p.m to 01.15 p.m    |               |
| Break 02.25 p.m to 02.30 p.m      | VI hour 01.35 p.m to 02.45 p.m   |               |
| V hour 02.30 p.m to 03.25 p.m     | VII hour 02.45 p.m to 03.35 p.m  |               |
| Break 03.25 p.m to 03.30 p.m      | VIII hour 03.35 p.m to 04.25 p.m |               |
| VI hour 03.30 p.m to 04.25 p.m    |                                  |               |
| Lunch break 12.25 p.m to 1.30 p.m | Lunch break 1.15 p.m to 1.55 p.m |               |

**SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE**  
(An Autonomous Institution)  
Accredited in REAARTE, Swa 1976 and Accredited by NAAC with 'A' Grade  
Madagadipet, Pudukcherry - 605 107

**Academic Calendar**  
November 2021 to April 2022

Name : \_\_\_\_\_  
 Programme : B.Tech.  
 Department : \_\_\_\_\_  
 Year / Sem : 1 year / 1 semester

மதுரை தலைநகரில் உள்ள, மதுரை மருத்துவ கல்லூரி  
 கல்வி அமைச்சர் அலுவலகம், மதுரை, கல்வி அமைச்சர் அலுவலகம், மதுரை  
 மதுரை மருத்துவ கல்லூரி, மதுரை மருத்துவ கல்லூரி, மதுரை மருத்துவ கல்லூரி  
 மதுரை மருத்துவ கல்லூரி, மதுரை மருத்துவ கல்லூரி, மதுரை மருத்துவ கல்லூரி  
 மதுரை மருத்துவ கல்லூரி, மதுரை மருத்துவ கல்லூரி, மதுரை மருத்துவ கல்லூரி  
 மதுரை மருத்துவ கல்லூரி, மதுரை மருத்துவ கல்லூரி, மதுரை மருத்துவ கல்லூரி  
 மதுரை மருத்துவ கல்லூரி, மதுரை மருத்துவ கல்லூரி, மதுரை மருத்துவ கல்லூரி

**About Autonomous**

Sri Manakula Vinayagar Engineering College has been conferred with Autonomous Status by the University Grants Commission on 26<sup>th</sup> September 2019 and the same was approved by Pondicherry University on 19<sup>th</sup> June 2020. SMVEC Autonomous Regulations R2019, is followed for the students admitted in the Academic Year 2020-21. SMVEC Autonomous Regulations R2020, is followed for the students admitted from the Academic Year 2021-22.

**HIGHLIGHTS OF SMVEC AUTONOMOUS REGULATIONS 2020**

- ◆ Tamil, Hindi and French as options in Modern Indian Language
- ◆ Industry 4.0 ready curriculum
- ◆ Skill enhancement courses in every semester
- ◆ Multidisciplinary curriculum with open elective courses
- ◆ Courses on entrepreneurial development
- ◆ IELTS / IAS / entrance exams coaching
- ◆ Declaration of results within a month after completion of examinations
- ◆ Employability Enhancement Course

The Institute has Established 17 Centers of Excellence to provide 91 International Certification courses from IBM, Google, Cisco, E Plan, Microsoft, Autodesk, Texas instruments, Intel, Bentley, Schneider Electric, Amazon web services, Siemens, Intel, DELL, EMC, Hewlett Packard, PTC, LN an Excellence in Technology & Didactic solutions. All the students should enroll in the certification course in every semester

- ◆ Industrial Training / Internship

Students may undergo training or internship during summer / winter vacation at Industry / Research organization. Students are also permitted to undergo internships during their sixth semester after the theory classes are over.

| April 2022 |     |  |                       |
|------------|-----|--|-----------------------|
| Date       | Day | Schedule                               | Working day / Holiday |
| 1          | Fri |  |                       |
| 2          | Sat |  |                       |
| 3          | Sun |  | Holiday               |
| 4          | Mon |  |                       |
| 5          | Tue |  |                       |
| 6          | Wed |  |                       |
| 7          | Thu |  |                       |
| 8          | Fri |  |                       |
| 9          | Sat |  |                       |
| 10         | Sun |  | Holiday               |
| 11         | Mon |  |                       |
| 12         | Tue |  |                       |
| 13         | Wed |  |                       |
| 14         | Thu | Tamil New Year / Dr. Ambedkar Birthday | Holiday               |
| 15         | Fri | Good Friday                            | Holiday               |
| 16         | Sat |  |                       |
| 17         | Sun |  | Holiday               |
| 18         | Mon |  |                       |
| 19         | Tue |  |                       |
| 20         | Wed |  |                       |
| 21         | Thu |  |                       |
| 22         | Fri |  |                       |
| 23         | Sat |  |                       |
| 24         | Sun |  | Holiday               |
| 25         | Mon |  |                       |
| 26         | Tue |  |                       |
| 27         | Wed |  |                       |
| 28         | Thu |  |                       |
| 29         | Fri |  |                       |
| 30         | Sat |  |                       |
| 31         | Sun |  | Holiday               |
|            |     | Total number of working days :         |                       |
|            |     | Total number of holiday :              |                       |

| March 2022                        |     |   |                       |
|-----------------------------------|-----|---|-----------------------|
| Date                              | Day | Schedule  | Working day / Holiday |
| 1                                 | Tue |   | 76                    |
| 2                                 | Wed |   | 77                    |
| 3                                 | Thu |   | 78                    |
| 4                                 | Fri |   | 79                    |
| 5                                 | Sat |   | 80                    |
| 6                                 | Sun |   | Holiday               |
| 7                                 | Mon | Model exam starts (5 units)                         | 81                    |
| 8                                 | Tue |   | 82                    |
| 9                                 | Wed |   | 83                    |
| 10                                | Thu |   | 84                    |
| 11                                | Fri | Model exam result analysis and report submission    | 85                    |
| 12                                | Sat |   | 86                    |
| 13                                | Sun |   | 87                    |
| 14                                | Mon | Model practical starts                              | 88                    |
| 15                                | Tue |   | 89                    |
| 16                                | Wed | Model practical ends                                | 90                    |
| 17                                | Thu |   |                       |
| 18                                | Fri |   |                       |
| 19                                | Sat |   | Holiday               |
| 20                                | Sun | Tentative End Semester Practical Examination Starts |                       |
| 21                                | Mon |   |                       |
| 22                                | Tue |   |                       |
| 23                                | Wed | Tentative End Semester Practical Examination Ends   |                       |
| 24                                | Thu |   |                       |
| 25                                | Fri | Study Holiday                                       |                       |
| 26                                | Sat |   |                       |
| 27                                | Sun |   | Holiday               |
| 28                                | Mon |   |                       |
| 29                                | Tue |   |                       |
| 30                                | Wed | Tentative End Semester Theory Examination Starts    |                       |
| 31                                | Thu |   |                       |
| Total number of working days : 15 |     |   |                       |
| Total number of holiday : 02      |     |   |                       |

**Supplementary Examinations**

Supplementary examination is an additional examination conducted within a month of time after declaring the results. In order to complete the program within 3 years, only the student with maximum of two arrears will be permitted to appear for supplementary examination.

**Benefits**

- More number of students will receive the degree within the stipulated time.
- The industries prefer to recruit students having no arrears. If the supplementary examinations are 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 losing their attendance and the internal marks. Hence all the students are requested to attend the college on time. A student shall be permitted to appear for the End Semester Examination at the end of the semester only if he/she secures 75% of overall attendance.

**Repeating the Course**

A student who secures overall attendance which is less than 60% has to repeat the course with the approval from the Academic section of the institution.

**Mentor-Mentee System**

In this system a team of students are allotted to a mentor and he/she will be mentoring these students.

The internal marks will be provided fully based on the continuous assessment tests (CAT I to 2 and Model examinations)

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

**Scheme for Continuous Assessment Test**

| S. No | Course Type  | Continuous Assessment components |   |  |                   |            |            |            | Total Marks |            |
|-------|--------------|----------------------------------|---|--|-------------------|------------|------------|------------|-------------|------------|
|       |              | Test Marks                       | Average of marks for project work for each experiment | Average of marks for assignment report for each experiment | Model Exam Report | Assessment | Review - 1 | Review - 2 |             | Review - 3 |
| 1     | Theory       | 15                               | -   | -  | -                 | 5          | -          | -          | 5           | 25         |
| 2     | Practical    | -                                | 30  | 15   | 15                | -          | -          | -          | 10          | 50         |
| 3     | Project work | -                                | -   | -  | -                 | 10         | 10         | 20         | -           | 40         |

**Question Paper Patterns**

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

**Table (a) Question Paper pattern for CAT / Model exam**

| Test Type  | 2 Marks                                   | 5 Marks | 10 Marks | Total Marks |
|------------|---|---------|----------|-------------|
| CAT I to 2 | 5   | 4       | 2        | 30          |
| Model exam | End semester Examination Question Pattern |         |          | 75          |

**Table (b) Question paper patterns for End semester Examination (ESE)**

| 2 Marks                                     | 5 Marks | 10 Marks     | Total Marks |
|---|---------|--------------|-------------|
| 10  | 5       | 3 (out of 5) | 75          |
| (one question from each unit) (open choice) |         |              |             |

**End Semester Examination Question Paper Pattern for BSc Units Courses**

| Course | 2 Mark                                   | 5 Mark | 8 / 9 Mark   | End Marks |
|--------|--|--------|--|-----------|
| Part A | 5  | 2      | 1  | 37        |
|        | (out of 3 questions, one from each unit) |        | 8 mark question (out of 2 questions, Unit I and Unit II) |           |
| Part B | 5  | 2      | 2  | 38        |
|        | (out of 3 questions, one from each unit) |        | 9 mark question (compulsory question from unit III)      |           |

| February 2022                     |     |  |                       |
|-----------------------------------|-----|--|-----------------------|
| Date                              | Day | Schedule   | Working day / Holiday |
| 1                                 | Tue | CAT - II Result Analysis and Report submission                             | 52                    |
| 2                                 | Wed |  | 53                    |
| 3                                 | Thu |  | 54                    |
| 4                                 | Fri |  | 55                    |
| 5                                 | Sat | Special coaching class / Q / Seminar / G / Placement / Academic Activities | 56                    |
| 6                                 | Sun |  | Holiday               |
| 7                                 | Mon |  | 57                    |
| 8                                 | Tue |  | 58                    |
| 9                                 | Wed |  | 59                    |
| 10                                | Thu |  | 60                    |
| 11                                | Fri | Field trip / Industrial Visit  | 61                    |
| 12                                | Sat | Special coaching class / Q / Seminar / G / Placement / Academic Activities | 62                    |
| 13                                | Sun |  | Holiday               |
| 14                                | Mon |  | 63                    |
| 15                                | Tue |  | 64                    |
| 16                                | Wed |  | 65                    |
| 17                                | Thu |  | 66                    |
| 18                                | Fri |  | 67                    |
| 19                                | Sat | Assignment - II  | 68                    |
| 20                                | Sun |  | Holiday               |
| 21                                | Mon | Feedback from the students & Analysis                                      | 69                    |
| 22                                | Tue | OCM meeting 3 / Report Submission  | 70                    |
| 23                                | Wed |  | 71                    |
| 24                                | Thu |  | 72                    |
| 25                                | Fri |  | 73                    |
| 26                                | Sat |  | 74                    |
| 27                                | Sun |  | Holiday               |
| 28                                | Mon | Submission of attendance and Assessment Form - I                           | 75                    |
| Total number of working days : 24 |     |  |                       |
| Total number of holiday : 04      |     |  |                       |

**December 2022**

| Date | Day | Schedule  | Working day |
|------|-----|---|-------------|
| 1    | Tue | New Year  | Holiday     |
| 2    | Wed |   | Holiday     |
| 3    | Thu |   | 21          |
| 4    | Fri | CAT - I Final Analysis and Report Submission        | 22          |
| 5    | Sat |   | 23          |
| 6    | Sun |   | 24          |
| 7    | Mon |   | 25          |
| 8    | Tue | Special meeting for @ Home @ Parent Academic Advice | 26          |
| 9    | Wed |   | 27          |
| 10   | Thu |   | 28          |
| 11   | Fri |   | 29          |
| 12   | Sat |   | 30          |
| 13   | Sun |   | 31          |
| 14   | Mon | Assignment - I                                      | 01          |
| 15   | Tue | Practical   | 02          |
| 16   | Wed | Practical Review Day                                | 03          |
| 17   | Thu | Assignment - II                                     | 04          |
| 18   | Fri | Practical   | 05          |
| 19   | Sat | Practical Review Day                                | 06          |
| 20   | Sun | Assignment - III                                    | 07          |
| 21   | Mon | Practical   | 08          |
| 22   | Tue | Practical Review Day                                | 09          |
| 23   | Wed |   | 10          |
| 24   | Thu | CAT - I starts (1st class)                          | 11          |
| 25   | Fri |   | 12          |
| 26   | Sat |   | 13          |
| 27   | Sun |   | 14          |
| 28   | Mon |   | 15          |
| 29   | Tue |   | 16          |
| 30   | Wed |   | 17          |
| 31   | Thu | Submission of assignments and Assessment Term - I   | 18          |

Total number of working days : 21  
Total number of holiday : 10

**Weightage of Assessment for Theory Courses**

| Sl. No. | Test     | Portion for Test | Total Marks | Duration of Test | Weightage for Internal Marks |
|---------|----------|------------------|-------------|------------------|------------------------------|
| 1       | CAT - I  | 1/3 part         | 50          | 1 1/2 hours      | 25                           |
| 2       | CAT - II | 1/3 part         | 50          | 1 1/2 hours      | 25                           |
| 3       | Model    | All 3 parts      | 50          | 1 hour           | 5                            |

**Continuous Assessment for Theory courses**

**Distribution of Attendance marks for Theory : 6 marks**

The distribution of 6 marks for theory class attendance is as follows:  
 4 marks for 90% attendance and above  
 3 marks for 80% attendance and above but below 90%  
 2 marks for 70% attendance and above but below 80%  
 1 mark for 60% attendance and above but below 70%  
 0 marks for 50% attendance and above but below 60%  
 0 marks for 40% attendance and above but below 50%

**Distribution of Attendance marks for practical : 10 marks**

The distribution of 10 marks for practical class attendance is as follows:  
 10 marks for 90% attendance and above  
 8 marks for 80% attendance and above but below 90%  
 6 marks for 70% attendance and above but below 80%  
 4 marks for 60% attendance and above but below 70%  
 2 marks for 50% attendance and above but below 60%  
 0 marks for 40% attendance and above but below 50%

Note:  
 Students should not be absent for the classes. Attendance for the classes are monitored regularly and recorded. Continuous assessment marks will be based on the performance of the students in the continuous assessments i.e. Assignments and attendance percentage.

**Assignments**

Out of 25 (continuous assessment marks), 5 marks will be awarded for the assignments. The students have to submit 5 assignments in each subject. The assignments questions will be different for each and every student.

**Importance of Continuous Assessment marks**

The continuous assessment marks once earned are carried over to the subsequent semester also. Hence the students are requested to work hard to get the maximum of the continuous assessment marks. If the continuous assessment marks are lower, it will pull down the marks of getting the first class distinction, gold medals and so on.

**Importance of CAT I / CAT II / Model tests**

Continuous assessment marks are awarded for the performance in the CAT-I, CAT-II, Model tests. 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. Getting involved in the projects will help to understand the basics of the course. Moreover, the management awards each year for the best projects in each department.

**Participation in the Co-curricular / Co-extracurricular / Extra-curricular Activities**

All the students are encouraged to participate in the co-curricular / co-extracurricular / 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 at the technical event organized by the recognized institutions, then the management of the institution will also award an amount equivalent to the award / cash prize as a token of appreciation.

**Leave Record Book**

For each student, leave account record is 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 with prior approval from the BOD never be tampered properly. In exceptional cases, the students are permitted to get the approval after availing the leave.

**Transport Facility**

60 buses are arranged for the students to reach the college from Padubidri, Kanyakumbh, Changanassery, Punalur, Ponnani, Chidambaram, Madhavam and Idukki. The students are requested to use the transport facility as arranged for the students. The students are requested to use the library and sports facilities. The students are requested to utilize the transport facility.

All the students are requested to avoid mobile phones. Students who come by two-wheelers must wear helmet.

**December 2021**

| Date | Day | Schedule  | Working day |
|------|-----|---|-------------|
| 1    | Wed |   | 5           |
| 2    | Thu |   | 6           |
| 3    | Fri |   | 7           |
| 4    | Sat | Revision programs ends                              | 8           |
| 5    | Sun |   | Holiday     |
| 6    | Mon | Regular classes starts                              | 9           |
| 7    | Tue |   | 10          |
| 8    | Wed |   | 11          |
| 9    | Thu |   | 12          |
| 10   | Fri |   | 13          |
| 11   | Sat |   | 14          |
| 12   | Sun |   | Holiday     |
| 13   | Mon |   | 15          |
| 14   | Tue |   | 16          |
| 15   | Wed |   | 17          |
| 16   | Thu |   | 18          |
| 17   | Fri | Field trip / Industrial Visit                       | 19          |
| 18   | Sat | Special meeting for @ Home @ Parent Academic Advice | 20          |
| 19   | Sun |   | Holiday     |
| 20   | Mon |   | 21          |
| 21   | Tue |   | 22          |
| 22   | Wed | Assignment - I                                      | 23          |
| 23   | Thu | Practical from the students & Analysis              | 24          |
| 24   | Fri | CAT meeting 1 / Report Submission                   | 25          |
| 25   | Sat | Christmas   | Holiday     |
| 26   | Sun |   | Holiday     |
| 27   | Mon | CAT - I starts (1st class)                          | 26          |
| 28   | Tue |   | 27          |
| 29   | Wed |   | 28          |
| 30   | Thu |   | 29          |
| 31   | Fri | Submission of assignments and Assessment Term - I   | 30          |

Total number of working days : 26  
Total number of holiday : 05

| November 2021 |     |                                 |                     |
|---------------|-----|---------------------------------|---------------------|
| Date          | Day | Schedule                        | Working day/Holiday |
| 1             | Mon |                                 |                     |
| 2             | Tue |                                 |                     |
| 3             | Wed |                                 |                     |
| 4             | Thu | Deepavali                       | Holiday             |
| 5             | Fri |                                 |                     |
| 6             | Sat |                                 |                     |
| 7             | Sun |                                 |                     |
| 8             | Mon |                                 |                     |
| 9             | Tue |                                 |                     |
| 10            | Wed |                                 |                     |
| 11            | Thu |                                 |                     |
| 12            | Fri |                                 |                     |
| 13            | Sat |                                 |                     |
| 14            | Sun |                                 |                     |
| 15            | Mon |                                 |                     |
| 16            | Tue |                                 |                     |
| 17            | Wed |                                 |                     |
| 18            | Thu |                                 |                     |
| 19            | Fri |                                 |                     |
| 20            | Sat |                                 |                     |
| 21            | Sun |                                 |                     |
| 22            | Mon |                                 |                     |
| 23            | Tue |                                 |                     |
| 24            | Wed |                                 |                     |
| 25            | Thu | 1 year Induction Day            |                     |
| 26            | Fri | AICTE Induction programs starts | 1                   |
| 27            | Sat |                                 | 2                   |
| 28            | Sun |                                 |                     |
| 29            | Mon |                                 | 3                   |
| 30            | Tue |                                 | 4                   |

Total number of working days : 04  
Total number of holiday : 01

കേരള സർവകലാശാലയുടെ അംഗീകാരത്തിന് വിധേയമാക്കിയിരിക്കുന്ന വിവരങ്ങൾ ഉൾക്കൊള്ളുന്ന ഈ പട്ടിക കൃത്യമാണ്. - കേരളസർവകലാശാല

| Placement and Training Division  |         |                         |         |         |         |         |         |
|--|---------|-------------------------|---------|---------|---------|---------|---------|
| The placement cell functions round the clock throughout the year to establish contact with reputed multinational companies, industries and plays an important role in locating various job opportunities and placing large number of the students every year at these organizations.   |         |                         |         |         |         |         |         |
| Activities of the Training Division  |         |                         |         |         |         |         |         |
| <ul style="list-style-type: none"> <li>Arranges trainings for personality and interpersonal skill development</li> <li>Assess the students to get in-plant training</li> <li>Arranges industrial visits</li> <li>Creates awareness on the opportunities open for higher studies</li> <li>Arranges coaching classes for GATE, GRE, TOEFL, IELTS, IAS, IES etc.</li> </ul> |         |                         |         |         |         |         |         |
| Placement Record   |         |                         |         |         |         |         |         |
| Academic Year  | 2014-15 | 2015-16                 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 |
| Students Placed  | 9%      | 9%                      | 91%     | 9%      | 9%      | 9%      | 96%     |
| Details of Placed Students : 2021-22   |         |                         |         |         |         |         |         |
| KVAR Technologies  | 27      | Amu Qada                | 2       |         |         |         |         |
| Vinva  | 11      | Chartered Technologists | 3       |         |         |         |         |
| ZIRB   | 11      | Java Vectors            | 1       |         |         |         |         |
| ICS  | 147     | Esolcom                 | 1       |         |         |         |         |
| Univsys  | 11      | Ben Lab Instrument      | 2       |         |         |         |         |
| CTS  | 530     | Elomson                 | 5       |         |         |         |         |
| Zucpi  | 1       | Unifield                | 3       |         |         |         |         |
| Entech   | 1       | Majlam India            | 20      |         |         |         |         |
| Tecon  | 1       | CNS                     | 3       |         |         |         |         |
| Wipac  | 124     | Adroit Soft             | 1       |         |         |         |         |
| Munising   | 46      | Shirah Infotech         | 6       |         |         |         |         |
| DataMatrix   | 2       | Accenture               | 1       |         |         |         |         |
| Microchip technologies   | 1       | MST ReBar               | 18      |         |         |         |         |
| Opko   | 7       | Sikolar Academy         | 13      |         |         |         |         |
| Secure Cloud   | 6       | ANZ Bak                 | 1       |         |         |         |         |
| Support Studio   | 4       | BIS market              | 1       |         |         |         |         |
| Cappemini  | 6       | Karr Technology         | 2       |         |         |         |         |
| Falton   | 4       |                         |         |         |         |         |         |
| Herman   | 3       |                         |         |         |         |         |         |
| Mindtree   | 3       |                         |         |         |         |         |         |
| TKL  | 5       | Total                   | 748     |         |         |         |         |

\* till February 2022

| 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 Goldmedals and Top Ten Ranks won by the students are given below.  |                              |      |                              |  |
| ☉ Indicates the Gold medal and University First Rank.  |                              |      |                              |  |
| The Management awards 3 sovereigns of gold to the 1 <sup>st</sup> rank holder, 2 sovereigns to the 2 <sup>nd</sup> rank holder, 1 sovereign to the 3 <sup>rd</sup> rank holder, 4 <sup>th</sup> and 5 <sup>th</sup> rank holders shall receive cash award of Rs. 10,000/- (Rupees ten thousand) each and 6 <sup>th</sup> to 10 <sup>th</sup> rank holders shall receive a cash award of Rs. 5,000/- (Rupees five thousand) each. |                              |      |                              |  |
| Name of the Course   | Year                         |      |                              |  |
|  | 2017                         | 2018 | 2019                         |  |
| B.Tech EEE   | 2, 4, 6, 7                   | ☉    | ☉ 2, 3, 4, 6, 7, 8, 9, 10    |  |
| B.Tech ECE   | 2, 3, 4, 5, 6, 7, 8, 9, 10   |      | ☉ 3, 4, 5, 6, 7, 9, 10       |  |
| B.Tech CSE   | ☉ 2, 3, 4, 10                |      | ☉ 2, 4, 6, 7, 8, 10          |  |
| B.Tech IT  | ☉ 2, 3, 4, 5, 6, 7, 8, 9, 10 | ☉    | ☉ 2, 3, 5, 6, 8              |  |
| B.Tech EE  | ☉ 2, 3, 4, 5, 6, 7, 8, 9, 10 |      | ☉ 2, 3, 4, 5, 6, 7, 8, 9, 10 |  |
| B.Tech Mech  | ☉ 4, 5, 7, 9, 10             |      | 3, 7, 8, 10                  |  |
| B.Tech Civil   | 2, 3, 10                     |      | 2, 3, 4, 6, 7, 10            |  |
| MCA  | 3, 4, 7, 9, 10               | ☉    | ☉ 2, 6, 7, 8, 9, 10, 11      |  |
| MBA  | ☉ 3, 4, 6, 7, 8              |      | ☉ 2, 4, 5, 7, 8, 10          |  |
| M.Tech CSE   | ☉ 2, 3, 4, 5, 7, 8, 9        |      | ☉ 7                          |  |
| M.Tech ECE   | 2, 3, 6, 7, 8, 9             |      | 2, 3, 4, 5                   |  |
| M.Tech EED   | ☉                            |      | ☉ 2, 3                       |  |
| M.Tech NW  | ☉ 2, 3, 4, 5, 7, 8, 9        |      | ☉ 2, 3                       |  |
| M.Tech VLSI  | ☉                            |      | ☉ 2, 3, 4                    |  |
| M.Tech DS  | ☉ 2                          |      | ☉                            |  |

| Important points for the kind attention of the Parents  |  |
|---|--|
| Dear Parent   |  |
| The I semester classes commenced on 26 <sup>th</sup> November 2021. 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.  |  |
| It is compulsory for all the students to complete Certificate Courses, Skill Development Courses and Mandatory Courses along with their Academic Courses. These courses will enhance the students to upgrade their required skills to cope up with the Industry.  |  |
| 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 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 cut the 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 DEAN at 0413-2642000 (extn) 2308. |  |
| Wi-Fi Campus  |  |
| Our campus has been enabled by high speed uninterrupted Wi-Fi connectivity. The Computer Centre is open till 8.00 p.m. on all the working days except on the dates of University examinations.  |  |
| Library Working Hours   |  |
| 8.30 a.m. to 8.30 p.m. (On all the working days)  |  |
| 8.30 a.m. to 10.00 p.m. (During the examination days)   |  |
| Women Cell  |  |
| For the benefit of the girl students, a Women 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 Chairperson / members to redress their grievances. Mail ID: grievance@univoc.ac.in  |  |

Annexure - IV



**SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE**

(An Autonomous Institution)  
(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)  
(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution &  
Accredited by NAAC with 'A' Grade)  
Madagadipet, Puducherry - 605 107



**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**LIST OF STUDENTS AND FACULTIES ENROLLED FOR  
NPTEL COURSE DURING THE ACADEMIC YEAR 2021 - 2022**

| PERIOD                  | DEPARTMENT | FACULTIES  | STUDENTS |
|-------------------------|------------|------------|----------|
| JAN-APR 2022            | EEE        | 16         | 111      |
| <b>Total Enrollment</b> |            | <b>127</b> |          |



# SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)  
(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution &  
Accredited by NAAC with 'A' Grade)

Madagadipet, Puducherry - 605 107



## NPTEL

### DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

#### List of faculty enrolled for NPTEL during the academic year 2021-2022

| S. No | Name                     | Designation         | Name of the course registered                                       |
|-------|--------------------------|---------------------|---|
| 1     | Dr. S.Anbumalar          | Professor & Head    | NBA Accreditation & Teaching And Learning in Engineering [12 Weeks] |
| 2     | Dr.P.Jamuna              | Professor           |   |
| 3     | Dr.D.Raja                | Professor           |   |
| 4     | Dr.K.Gowrishankar        | Professor           |   |
| 5     | Dr.G.GaneshKumaran       | Associate Professor |   |
| 6     | Dr.M.Jayachandran        | Assistant Professor |   |
| 7     | Mr.A.Janagiraman         | Assistant Professor |   |
| 8     | Mr.K.Thangaraj           | Assistant Professor |   |
| 9     | Mr.J.Muruganandam        | Assistant Professor |   |
| 10    | Mr.C.Adrien Perianayagam | Assistant Professor |   |
| 11    | Mr.R.Ragupathy           | Assistant Professor |   |
| 12    | Ms.N.Swamalakshmi        | Assistant Professor |   |
| 13    | Mr.R.Nakkeeran           | Assistant Professor |   |
| 14    | Mr.D.Sivaraj             | Assistant Professor |   |
| 15    | Ms.R.Aarthi              | Assistant Professor |   |
| 16    | Mr.I.Shivashankar        | Assistant Professor | Effective Engineering Teaching in Practice [4 Weeks]                |

#### List of students enrolled for NPTEL during the academic year 2021-2022

| S. No. | Name            | Sem | Sec | Name of the course                 |                 |
|--------|-----------------|-----|-----|------------------------------------|-----------------|
| 1      | ABDUL RAZAAK. A | V   | A   | Microprocessor and Microcontroller |                 |
| 2      | ABIRAAMI. V     | V   | A   | Microprocessor and Microcontroller |                 |
| 3      | AKASH. S        | V   | B   | Microprocessor and Microcontroller |                 |
| 4      | AKSHAYA S       | V   | B   | Ethical Hacking                    |                 |
| 5      | ALASHFAK M      | V   | B   | Microprocessor and Microcontroller |                 |
| 6      | ANAND M V       | V   | B   | Microprocessor and Microcontroller |                 |
| 7      | ANJANA. V       | V   | A   | Microprocessor and Microcontroller |                 |
| 8      | ANNAMALAI. E    | V   | A   | Microprocessor and Microcontroller | Analog Circuits |
| 9      | ARAVIND. G      | V   | A   | Microprocessor and Microcontroller |                 |
| 10     | ARAVINDA. C     | V   | A   | Microprocessor and Microcontroller |                 |
| 11     | ARAVINDHAN. A   | V   | B   | Microprocessor and Microcontroller |                 |
| 12     | ARIPRASATH. N   | V   | A   | Microprocessor and Microcontroller |                 |
| 13     | ARTHI. A        | V   | A   | Microprocessor and Microcontroller |                 |
| 14     | ARULEESWARAN.P  | V   | B   | Microprocessor and Microcontroller |                 |
| 15     | ARUNACHALAM.T   | V   | A   | Microprocessor and Microcontroller |                 |
| 16     | ARVIND.D        | V   | B   | Microprocessor and Microcontroller |                 |



|    |                      |   |   |                                    |                 |
|----|----------------------|---|---|------------------------------------|-----------------|
| 17 | ASMA BEGAM. M        | V | B | Microprocessor and Microcontroller |                 |
| 18 | BHUVANESH I          | V | A | Microprocessor and Microcontroller |                 |
| 19 | BOMIDI PUJITHA       | V | B | Microprocessor and Microcontroller |                 |
| 20 | DEEPA PRAGASAN. V    | V | A | Microprocessor and Microcontroller |                 |
| 21 | DEEPIKA. V           | V | A | Microprocessor and Microcontroller |                 |
| 22 | DEIVAPRASATH.A       | V | B | Microprocessor and Microcontroller |                 |
| 23 | DELLI BABU. S        | V | B | Microprocessor and Microcontroller |                 |
| 24 | DEVANATHAN. J        | V | A | Microprocessor and Microcontroller |                 |
| 25 | DHILIPKUMAR. S       | V | A | Microprocessor and Microcontroller |                 |
| 26 | DHINESHE. S          | V | A | Microprocessor and Microcontroller |                 |
| 27 | DHIVYADARSHNI. V     | V | A | Microprocessor and Microcontroller |                 |
| 28 | DILEEP PRASATH K     | V | B | Microprocessor and Microcontroller |                 |
| 29 | DINESH BABU.A        | V | A | Microprocessor and Microcontroller |                 |
| 30 | DINESH KUMAR. M      | V | B | Microprocessor and Microcontroller |                 |
| 31 | GOGULARAJ.V          | V | A | Microprocessor and Microcontroller |                 |
| 32 | GOKULRAJ N           | V | B | Microprocessor and Microcontroller |                 |
| 33 | GOKUL S              | V | A | Microprocessor and Microcontroller |                 |
| 34 | GUGAN. M             | V | A | Fundamental of Power Electronics   |                 |
| 35 | GUNAVATHI S          | V | B | Microprocessor and Microcontroller |                 |
| 36 | HARIHARAN S          | V | B | Microprocessor and Microcontroller |                 |
| 37 | HARI PRASAD K        | V | A | Microprocessor and Microcontroller |                 |
| 38 | HARISH. A            | V | A | Microprocessor and Microcontroller |                 |
| 39 | HEMALATHA A          | V | A | Microprocessor and Microcontroller |                 |
| 40 | HEMALATHA. V         | V | B | Microprocessor and Microcontroller | Ethical hacking |
| 41 | HEMAMAALAN. C        | V | B | Microprocessor and Microcontroller |                 |
| 42 | ISRAK HUSSAIN. S     | V | B | Microprocessor and Microcontroller |                 |
| 43 | IYYAPPAN. M          | V | A | Microprocessor and Microcontroller |                 |
| 44 | JAGADHEESAN. P       | V | B | Microprocessor and Microcontroller |                 |
| 45 | JAGAN.P              | V | A | Microprocessor and Microcontroller |                 |
| 46 | JAI GANESH. J        | V | A | Microprocessor and Microcontroller |                 |
| 47 | JAWAHAR. G           | V | B | Microprocessor and Microcontroller |                 |
| 48 | JEEVAJOTHI. K        | V | B | Microprocessor and Microcontroller |                 |
| 49 | JENSY ALBIYA. A.J.   | V | B | Microprocessor and Microcontroller |                 |
| 50 | KARTHIK. R           | V | B | Microprocessor and Microcontroller |                 |
| 51 | KHAJA MOIDEEN S      | V | B | Microprocessor and Microcontroller |                 |
| 52 | KIRUTHIGA. C         | V | A | Microprocessor and Microcontroller |                 |
| 53 | KISHOR. G            | V | A | Microprocessor and Microcontroller |                 |
| 54 | KISHORE.D            | V | B | Microprocessor and Microcontroller |                 |
| 55 | KUMARAN. S           | V | A | Microprocessor and Microcontroller |                 |
| 56 | LOGANATHAN S         | V | B | Microprocessor and Microcontroller |                 |
| 57 | LOGESHWARAN. V       | V | A | Microprocessor and Microcontroller |                 |
| 58 | LOKESWARI. G         | V | B | Microprocessor and Microcontroller |                 |
| 59 | MESHACH. E           | V | B | Ethical Hacking                    |                 |
| 60 | MOHAMED FAWAZ.Y      | V | A | Microprocessor and Microcontroller |                 |
| 61 | NANDHINI.C           | V | A | Microprocessor and Microcontroller |                 |
| 62 | NARENDARAN.A         | V | B | Microprocessor and Microcontroller |                 |
| 63 | NIVETHITHA. R        | V | A | Microprocessor and Microcontroller |                 |
| 64 | NIVETHITHAASRI. P.R. | V | B | Microprocessor and Microcontroller |                 |
| 65 | OUMAR GOURU. O       | V | A | Microprocessor and Microcontroller |                 |
| 66 | PALEPU SHIVA         | V | B | Microprocessor and Microcontroller |                 |

|     |                     |   |   |  |                                    |
|-----|---------------------|---|---|--|------------------------------------|
| 67  | PRAVIN. M           | V | A | Microprocessor and Microcontroller                                   |                                    |
| 68  | PRIYADHARSHAN. S    | V | B | Microprocessor and Microcontroller                                   |                                    |
| 69  | PRIYENGA.E          | V | A | Microprocessor and Microcontroller                                   |                                    |
| 70  | RAJARAJAN. D        | V | A | Microprocessor and Microcontroller                                   |                                    |
| 71  | RAJMUGILAN. R       | V | B | Microprocessor and Microcontroller                                   |                                    |
| 72  | RASIN A             | V | B | Microprocessor and Microcontroller                                   |                                    |
| 73  | RATHINASABAPATHY A  | V | A | Microprocessor and Microcontroller                                   |                                    |
| 74  | SAKTHI ESWARAN.S    | V | B | Microprocessor and Microcontroller                                   |                                    |
| 75  | SANCHUNA .S         | V | B | Microprocessor and Microcontroller                                   | Ethical hacking                    |
| 76  | SANJAY. M           | V | B | Microprocessor and Microcontroller                                   |                                    |
| 77  | SANJAY. M           | V | A | Microprocessor and Microcontroller                                   |                                    |
| 78  | SARAVANAKRISHNAN. V | V | B | Microprocessor and Microcontroller                                   |                                    |
| 79  | SATHYANARAYANAN.V   | V | A | Microprocessor and Microcontroller                                   |                                    |
| 80  | SHARAN. S           | V | B | Renewable Energy Engineering: Solar, Wind and Biomass Energy Systems | Microprocessor and Microcontroller |
| 81  | SINDHUJA. K         | V | A | Microprocessor and Microcontroller                                   |                                    |
| 82  | SIVABALAN S         | V | B | Renewable Energy Engineering: Solar, Wind and Biomass Energy Systems | Microprocessor and Microcontroller |
| 83  | SIVARAMAN P         | V | A | Microprocessor and Microcontroller                                   |                                    |
| 84  | SOWMYA S            | V | B | Fuzzy Sets, Logic and Systems & Applications                         | Microprocessor and Microcontroller |
| 85  | SUNIL KUMAR. M      | V | B | Microprocessor and Microcontroller                                   |                                    |
| 86  | SURENDAR.G          | V | A | Microprocessor and Microcontroller                                   |                                    |
| 87  | SURYAPRAKASH. P     | V | B | Microprocessor and Microcontroller                                   |                                    |
| 88  | THAMARAISELVAN. S   | V | B | Renewable Energy Engineering: Solar, Wind and Biomass Energy Systems | Microprocessor and Microcontroller |
| 89  | THAMIZHSELVAN. G    | V | B | Microprocessor and Microcontroller                                   |                                    |
| 90  | THAMIZHSELVAN V     | V | A | Microprocessor and Microcontroller                                   |                                    |
| 91  | THANYASRI.S.K       | V | A | Microprocessor and Microcontroller                                   |                                    |
| 92  | THIRUMANIRAJ. P     | V | A | Microprocessor and Microcontroller                                   |                                    |
| 93  | THIRUMARAN. D       | V | A | Microprocessor and Microcontroller                                   |                                    |
| 94  | VASANTHAKUMAR. R    | V | B | Microprocessor and Microcontroller                                   |                                    |
| 95  | VETRIVEL.V          | V | A | Microprocessor and Microcontroller                                   |                                    |
| 96  | VIDHYALAKSHMI E     | V | B | Microprocessor and Microcontroller                                   |                                    |
| 97  | VIGNESH. K          | V | B | Microprocessor and Microcontroller                                   |                                    |
| 98  | VIGNESHWARAN.V      | V | A | Microprocessor and Microcontroller                                   |                                    |
| 99  | YOGESH. A           | V | B | Microprocessor and Microcontroller                                   |                                    |
| 100 | YOGESH. R           | V | A | Microprocessor and Microcontroller                                   |                                    |
| 101 | YOGESHWAR S         | V | A | Microprocessor and Microcontroller                                   |                                    |
| 102 | ATHMAJAN.S          | V | B | Microprocessor and Microcontroller                                   |                                    |
| 103 | DHANUSH.N           | V | B | Microprocessor and Microcontroller                                   | Power System Engineering           |
| 104 | GANESAMURTHY. S     | V | A | Microprocessor and Microcontroller                                   |                                    |
| 105 | JAVITH AHAMED.J     | V | B | Microprocessor and Microcontroller                                   |                                    |
| 106 | MUTHUKUMARAN.R      | V | A | Microprocessor and Microcontroller                                   |                                    |
| 107 | NANTHAKUMAR.B       | V | A | Microprocessor and Microcontroller                                   |                                    |
| 108 | NAYAKAN.S.T         | V | A | Microprocessor and Microcontroller                                   |                                    |
| 109 | SAMEER.B            | V | A | Microprocessor and Microcontroller                                   |                                    |
| 110 | SETHURAM.S          | V | B | Microprocessor and Microcontroller                                   |                                    |
| 111 | THAAHADHAMSHARIF.N  | V | B | Microprocessor and Microcontroller                                   |                                    |

**Annexure – V**

**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 Drives  |            |                            |
|----------------|-------------------------|---|------------|----------------------------|
| S. No          | Name of the Examiner    | Designation & Institution Name  | Mobile No  | Mail ID                    |
| 1.             | Dr.J.Ramesh Rahul       | Assistant Professor / EEE,<br>National institute of<br>Technology,<br>Andhra Pradesh                                      | 7989923036 | rahuljammy1925@gmail.com   |
| 2.             | Dr.K.K.Saravanan        | Assistant Professor / EEE,<br>University College of<br>Engineering,<br>Thirukuvalai campus,<br>Nagapattinam               | 9789695832 | saravanan.santi@gmail.com  |
| 3.             | Dr. S. Jeyasudha,       | Professor / EEE,<br>K.Ramakrishnan College of<br>Technology, Trichy,  | 9629054969 | jeayasudhas.eee@krct.ac.in |
| 4.             | Dr.S.A.Elankurisil      | Professor & Head / EEE,<br>Adhiparasakthi Engineering<br>College, Melmaruvathur.  | 9442936797 | saelankurisil@gmail.com    |
| 5.             | Dr.V.Vasan Prabhu       | Assistant Professor /<br>Department of Automotive<br>Electronics,<br>SRM Institute of Science<br>and Technology, Chennai. | 7358682007 | vasanprv@srmist.edu.in     |
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| 7.             | Dr.R.Raja Singh         | Associate Professor /<br>Department of Energy and<br>Power Electronics,<br>VIT, Vellore.                                  | 9894250650 | rrajasingh@vit.ac.in       |
| 8.             | Dr.C. Kumar             | Professor and Head / EEE<br>M Kumarasamy College of<br>Engineering<br>Thalavapalayam Post,<br>Karur TK.                   | 9994942022 | kumarc@bitsathy.ac.in      |
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| 12. | Dr.D.Zamrooth              | Assistant Professor,<br>Department of EEE,<br>University college of<br>Engineering, Kanchipuram                            | 9176773605 | zam.shireen@gm<br>ail.com                  |
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| 14. | Dr.S.Prabhu                | Associate Professor,<br>Department of EEE,<br>SreeVidyanikethan<br>Engineering College,<br>SreeSainath Nagar,<br>Tirupati. | 9600646211 | prabhutajmahal6<br>@gmail.com              |
| 15. | Dr.R.Natarajan             | Associate Professor / EEE<br>Fatima Michael College of<br>Engineering and<br>Technology, Madurai                           | 9655986026 | natarajanrajave3<br>69@gmail.com           |
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| 17. | Dr.S.Priyadharashni,       | Assistant Professor / EEE,<br>Arunai Engineering<br>College,<br>Velu Nagar, Mathur,<br>Tiruvannamalai,<br>Tamilnadu.       | 9994576791 | priyamshanmuga<br>m@gmail.com              |
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| 19. | Dr.R.Murugesan             | Asst. Professor,<br>Department of EEE,<br>Annamacharya Institute of<br>Technology and Sciences<br>Thirupati                | 9944228455 | rmurugesandr@g<br>mail.com                 |
| 20. | Dr.T Suresh<br>Padmanabhan | Associate Professor,<br>Department of ECE,<br>E.G.S Pillay Engineering<br>College, Nagapattinam.                           | 9444025552 | dirtsp@egspec.or<br>g                      |
| 21. | Dr.T.S.BalajiDamodhar      | Associate Professor / EEE,<br>Ranipettai Engineering<br>College, Walajah, Vellore  | 9944665102 | balajidamodhar@<br>gmail.com               |
| 22. | Dr.C.Kannan                | Associate Professor / EEE,<br>Arunai Engineering<br>College, Thiruvannamalai.  | 9841005438 | kannanc305@gm<br>ail.com                   |
| 23. | Dr.S.Satthiyaraj           | Associate Professor / EEE,<br>University College of<br>Engineering,<br>Panruti   | 9500405949 | satthiya@gmail.c<br>om                     |
| 24. | Dr.G.Madhusudanan          | Professor / EEE,<br>SRM Nagar,<br>Kattankulathur,<br>Chengalpattu.   | 9884413903 | madhusudanang.<br>eee@valliammai.<br>co.in |
| 25. | Dr.G.Haridoss              | Associate Professor/EEE,<br>M. A. M College of<br>Engineering and<br>Technology, Siruganur,<br>Trichy                      | 9865481065 | haridoss@gmail.<br>com                     |
| 26. | Dr.S.Albert Alexander      | Associate Professor / EEE,<br>Kongu Engineering<br>College,<br>Perundurai, Erode.  | 9865931597 | ootyalex@gmail.c<br>om                     |

|     |                            |   |            |                           |
|-----|----------------------------|---|------------|---------------------------|
| 27. | Dr.K.Arul Kumar            | Assistant Professor / EEE,<br>Madanapalle Institute of<br>Technology & Science,<br>Madanapalle-<br>Chittoor District, Andhra<br>Pradesh | 9994822651 | karuleee@gmail.com        |
| 28. | Dr.Mahendran<br>Nagalingam | Professor / HOD,<br>SAINTGITS College of<br>Engineering Kottayam,<br>Kerala   | 9894243719 | drnmpower@gmail.com       |
| 29. | Mr.A.Vinothkumar           | Assistant Professor / EEE,<br>SRI College of Engineering<br>and Technology,<br>Vandavasi.   | 6379224893 | vinothkumaree91@gmail.com |
| 30. | Mr.C.Nandakumar            | Assistant Professor / EEE<br>Arunai Engineering<br>College,<br>Velu Nagar, Mathur,<br>Tiruvannamalai                                    | 9865714571 | nandha30electra@gmail.com |

| Specialization |                               | Power Systems   |            |                                |
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| S. No          | Name of the Examiner          | Designation & Institution Name  | Mobile No  | Mail ID                        |
| 1.             | Dr.N.Chidambararaj            | Associate Professor / EEE,<br>St.Joseph's College of<br>Engineering, OMR,<br>Chennai  | 9840826431 | chidambararajn@stjosephs.ac.in |
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| 3.             | Dr. V. Subha<br>Seethalakshmi | Associate Professor / EEE,<br>Dhanalakshmi Srinivasan<br>Engineering College,<br>Perambalur                                 | 9865724662 | vsubha05@gmail.com             |
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| 6.             | Dr.Arul Murugan               | Professor & Head / EEE<br>Excel Group of Institutions<br>Erode, TamilNadu   | 9842909393 | arulpvp@gmail.com              |
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|     |                       |  |            |                              |
|-----|-----------------------|--|------------|------------------------------|
| 10. | Dr.S.Karthikeyan      | Assistant Professor<br>Department of EEE,<br>Annamalai University,<br>Chidambaram                        | 8825793371 | karthikaueee79@<br>gmail.com |
| 11. | Dr.M.Sathya           | Assistant Professor,<br>Department of EEE,<br>Government college of<br>Engineering,<br>Srirangam, Trichy | 7010271378 | mrsathyaa@gces.<br>edu.in    |
| 12. | Dr. R. Suresh         | Associate Professor / EEE,<br>SKP Engineering College ,<br>Thiruvannamalai                               | 9943863622 | rsureshskp@gmai<br>l.com     |
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| 14. | Ms.V.Logeshwari       | Assistant Professor<br>Department of EEE,<br>Government College of<br>Engineering, Srirangam.            | 8778727201 | logulagam@gmail<br>.com      |

| Specialization |                      | Electrical Drives and Control  |            |                                 |
|----------------|----------------------|--|------------|---------------------------------|
| S. No          | Name of the Examiner | Designation & Institution Name   | Mobile No  | Mail ID                         |
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| 2              | Dr. R .Gunabalan     | Associate Professor,<br>School of Electrical<br>Engineering,<br>VIT,Vandalur-<br>Kelambakkam Road,<br>Chennai. | 9894919269 | gunabalan.r@vit.a<br>c.in       |
| 3              | Dr.V.Krishnakumar    | Associate Professor / EEE<br>St.Joseph college of<br>Engineering<br>Chennai.                                   | 9944235136 | v.krishnakumarjce<br>@gmail.com |
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| Specialization |                      | Electrical Engineering   |                            |                             |
|----------------|----------------------|--|----------------------------|-----------------------------|
| S. No          | Name of the Examiner | Designation & Institution Name   | Mobile No                  | Mail ID                     |
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| 2              | Dr.S.R.Sivarasu,     | Professor / EEE,<br>Sri Eshwar College of<br>Engineering (Autonomous)<br>Coimbatore. | 8056719372 /<br>9942029372 | sivarasu.s.r@sec<br>e.ac.in |

| Specialization |  | Image Processing |  |  |
|----------------|--|------------------|--|--|
|----------------|--|------------------|--|--|

| S. No | Name of the Examiner | Designation & Institution Name  | Mobile No  | Mall ID                      |
|-------|----------------------|---|------------|------------------------------|
| 1     | Dr. S. Karthick      | Associate Professor /<br>EEE,<br>Sengunthar Engineering<br>College, Thudupathi Post,<br>Perundurai, Erode | 9486937253 | resumekarthick@<br>gmail.com |

| Specialization |                      | Very Large Scale Integration (VLSI)   |            |                            |
|----------------|----------------------|---|------------|----------------------------|
| S. No          | Name of the Examiner | Designation & Institution Name  | Mobile No  | Mall ID                    |
| 1              | Dr.T.Venishkunmar    | Associate Professor /<br>EEE,<br>Sethu Institute of<br>Technology,<br>Pulloor, Karlapatti,<br>Virudhunagar, Tamilnadu | 9095577477 | tvenishkumar@g<br>mail.com |

| Specialization |                      | Control System and Instrumentation   |                           |                            |
|----------------|----------------------|--|---------------------------|----------------------------|
| S. No          | Name of the Examiner | Designation & Institution Name   | Mobile No                 | Mall ID                    |
| 1              | Dr.S.N.Sivaraj       | Associate Professor/ EEE<br>Velammal Engineering<br>College, Chennai                       | 9944238133/<br>9080801268 | slvarajsn@gmail.<br>com    |
| 2              | Dr. P. Manikannan    | Professor / EEE,<br>AKT Memorial College of<br>Engineering and<br>Technology, Kallakurichi | 9786658571                | p.manikannan@<br>gmail.com |
| 3              | Mr.P.Jekan           | Assistant Professor / EEE,<br>SRM University,<br>Kattankulathur,<br>Chengalpattu.          | 9884937734                | jeganp@srmlst.o<br>du.in   |

| Specialization |                      | Applied Electronics  |            |                                |
|----------------|----------------------|--|------------|--------------------------------|
| S. No          | Name of the Examiner | Designation & Institution Name   | Mobile No  | Mall ID                        |
| 1              | Dr. J.P.Srividhya    | Associate Professor /<br>EEE,<br>Arunal Engineering<br>College, Tiruvannamalai | 9486985422 | sriviprakash2007<br>@gmail.com |

| Specialization |                      | Automotive Technology, Material Science   |            |                             |
|----------------|----------------------|---|------------|-----------------------------|
| S. No          | Name of the Examiner | Designation & Institution Name  | Mobile No  | Mall ID                     |
| 1              | Dr. S. Roseline      | Professor / EEE,<br>M. A. M College of<br>Engineering and<br>Technology, Siruganur,<br>Trichy | 9443435493 | roselines1969@<br>gmail.com |