

The following are the syllabus copy as per Anna university curriculum and relevant experiential learning document.

## **1.3.2**

# **COURSES THAT INCLUDE EXPERIENTIAL LEARNING THROUGH PROJECT WORK/FIELD WORK/INTERNSHIP DURING 2021-2022**

### 1.3.2 Average percentage of courses that include experiential learning through project work/field work/internship during 2021-2022

| S.No | Programme Offering                         | Name of the Course                          | Course Code | Project/Field Work/Internship | Page No. |
|------|--|---|-------------|-------------------------------|----------|
| 1    | B.E-Electrical and Electronics Engineering | Electric Circuit Analysis                   | EE3251      | Industrial Visit              | 1        |
| 2    | B.E-Electrical and Electronics Engineering | Digital Logic Circuits                      | EE8351      | In-plant Training             | 10       |
| 3    | B.E-Electrical and Electronics Engineering | Electromagnetic Theory                      | EE8391      | Project                       | 14       |
| 4    | B.E-Electrical and Electronics Engineering | Electrical Machines - I                     | EE8301      | Internship                    | 20       |
| 5    | B.E-Electrical and Electronics Engineering | Transmission and Distribution               | EE8402      | Internship                    | 25       |
| 6    | B.E-Electrical and Electronics Engineering | Measurements and Instrumentation            | EE8403      | In-plant Training             | 30       |
| 7    | B.E-Electrical and Electronics Engineering | Linear Integrated Circuits and Applications | EE8451      | Project                       | 35       |
| 8    | B.E-Electrical and Electronics Engineering | Control System                              | IC8451      | In-plant Training             | 41       |
| 9    | B.E-Electrical and Electronics Engineering | Power System Analysis                       | EE8501      | In-plant Training             | 46       |
| 10   | B.E-Electrical and Electronics Engineering | Microprocessors and Microcontrollers        | EE8551      | Project                       | 50       |
| 11   | B.E-Electrical and Electronics Engineering | Power Electronics                           | EE8552      | Internship                    | 56       |



| S.No | Programme Offering                         | Name of the Course                 | Course Code | Project/Field Work/Internship | Page No. |
|------|--|------------------------------------|-------------|-------------------------------|----------|
| 12   | B.E-Electrical and Electronics Engineering | Embedded Systems                   | EE8691      | Project                       | 60       |
| 13   | B.E-Electrical and Electronics Engineering | Modern Power Converters            | EE8004      | Internship                    | 66       |
| 14   | B.E-Electrical and Electronics Engineering | Solid State Drives                 | EE8601      | Project                       | 70       |
| 15   | B.E-Electrical and Electronics Engineering | Digital Signal Processing          | EE8591      | Project                       | 76       |
| 16   | B.E-Electrical and Electronics Engineering | Renewable Energy Systems           | EE8703      | Project                       | 82       |
| 17   | B.E-Electrical and Electronics Engineering | Electron Devices and Circuits      | EC8353      | Project                       | 88       |
| 18   | B.E-Electrical and Electronics Engineering | Physics for Electrical Engineering | PH3202      | Industrial Visit              | 94       |



  
**Dr. J.SUNDARARAJAN,**  
 B.E., M.Tech, Ph.D.,  
 Principal  
 N.P.R. College of Engineering & Technology  
 Natham, Dindigul (Dt) - 624 401.

**COURSE OBJECTIVES:**

- To introduce electric circuits and its analysis
- To provide key concepts to analyze and understand electrical circuits
- To impart knowledge on solving circuit equations using network theorems
- To educate on obtaining the transient response of circuits.
- To introduce the phenomenon of resonance in coupled circuits.
- To introduce Phasor diagrams and analysis of single & three phase circuits

**UNIT I BASIC CIRCUITS ANALYSIS****9+3**

Fundamentals concepts of R, L and C elements-Energy Sources- Ohm's Law -Kirchhoff 's Laws – **DC Circuits** – Resistors in series and parallel circuits - **A.C Circuits** – Average and RMS Value – Complex Impedance – Phasor diagram - **Real and Reactive Power, Power Factor, Energy** -Mesh current and node voltage methods of analysis D.C and A.C Circuits.

**UNIT II NETWORK REDUCTION AND THEOREMS FOR DC AND AC CIRCUITS****9+3**

Network reduction: voltage and current division, source transformation – star delta conversion. Theorems – Superposition, Thevenin's and Norton's Theorem – Maximum power transfer theorem – Reciprocity Theorem – Millman's theorem- Tellegen's Theorem-Statement, application to DC and AC Circuits.

**UNIT III TRANSIENT RESPONSE ANALYSIS****9+3**

Introduction – Laplace transforms and inverse Laplace transforms- **standard test signals** -Transient response of RL, RC and RLC circuits using Laplace transform for Source free, Step input and Sinusoidal input.

**UNIT IV RESONANCE AND COUPLED CIRCUITS****9+3**

Series and parallel resonance –frequency response – Quality factor and Bandwidth – **Self and mutual inductance** – Coefficient of coupling – Dot rule-Analysis of coupled circuits– **Single Tuned circuits.**

**UNIT V THREE PHASE CIRCUITS****9+3**

Analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced and unbalanced – phasor diagram of voltages and currents – **power measurement in three phase circuits– Power Factor Calculations.**

**TOTAL: 60 PERIODS****COURSE OUTCOMES:**

After completing this course, the students will be able to:

CO1: Explain circuit's behavior using circuit laws.

CO2: Apply mesh analysis/ nodal analysis / network theorems to determine behavior of the given DC and AC circuit

CO3: Compute the transient response of first order and second order systems to step and sinusoidal input

CO4: Compute power, line/ phase voltage and currents of the given three phase circuit

CO5: Explain the frequency response of series and parallel RLC circuits

CO6: Explain the behavior of magnetically coupled circuits.



## TEXT BOOKS:

1. William H. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis", McGraw Hill publishers, 9<sup>th</sup> edition, New Delhi, 2020.
2. Charles K. Alexander, Mathew N.O. Sadiku, "Fundamentals of Electric Circuits", Second Edition, McGraw Hill, 2019.
3. Allan H. Robbins, Wilhelm C. Miller, "Circuit Analysis Theory and Practice", Cengage Learning India, 2013.

## REFERENCES:

1. Chakrabarti A, "Circuits Theory (Analysis and synthesis), Dhanpat Rai & Sons, New Delhi, 2020.
2. Joseph A. Edminister, Mahmood Nahvi, "Electric circuits", Schaum's series, McGraw-Hill, First Edition, 2019.
4. M E Van Valkenburg, "Network Analysis", Prentice-Hall of India Pvt Ltd, New Delhi, 2015.
5. Richard C. Dorf and James A. Svoboda, "Introduction to Electric Circuits", 7th Edition, John Wiley Sons, Inc. 2018.
6. Sudhakar A and Shyam Mohan SP, "Circuits and Networks Analysis and Synthesis", McGrawHill, 2015.



  
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# NPR College of Engineering & Technology

NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

An ISO 9001:2015 Certified Institution.

Phone No: 04544- 246 500, 246501, 246502.

Website : [www.nprcolleges.org](http://www.nprcolleges.org), [www.nprcet.org](http://www.nprcet.org), Email [nprcetprincipal@nprcolleges.org](mailto:nprcetprincipal@nprcolleges.org)



## PERMISSION LETTER

From

Dr. T. Priya,  
Head of the Department,  
Department of Science and Humanities,  
NPR College of Engineering & Technology,  
Natham,  
Dindigul – 624 401.

To

The Administrative Office,  
NPR Group of Institutions,  
Natham,  
Dindigul – 624 401.

Through Proper Channel

Sir,

Sub: Requesting permission for Industrial visit – Reg.

This is to bring to your kind notice that we are planning to organize one day visit to **VEI Technologies** for the 1<sup>st</sup> Year students.

So, I request you to grant permission for 80 students from I Year (60 Boys & 20 Girls) and 2 staff members (Mr. P. Madasamy, AP/ Maths and Mrs.S.Visithra, AP/ Maths) on 18.12.2021 to visit **VEI Technologies, Chennai**.

Kindly do the needful.

Thanking you,

Yours faithfully,

  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

  
(Dr. T. Priya)





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## REQUISITION LETTER

Gmail

Inbox

NPR S&H<hodmathematicsnprcet@gmail.com>

To: [info@veitechnologies.com](mailto:info@veitechnologies.com)

Mon, DEC 13, 2021,  
10.16 AM

Respected Sir,

Greetings...!

Our NPR College of engineering and technology is situated in Natham, Dindigul district in a lush green environment established with the objective of ensuring the personal and professional development of the students from rural backgrounds offering UG and PG courses.

It has been a regular practice in our Science and Humanities Department to arrange industrial visits for our students every semester to reputed engineering industries. Based on that, 40 1 YEAR students and 2 staff members of our Science and Humanities department have planned to visit **VEI Technologies**. We assure you sir, our students will follow the safety rules and will not disturb your regular processes. We humbly request you to grant us permission for the same and to confirm the permission through letter or mail.

Thanks, and regards

Dr. T. Priya,

Professor & Head

Department of Science and Humanities,

NPRCET,

Natham.



Reply Forward







# NPR College of Engineering & Technology

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## CONFIRMATION LETTER FROM INDUSTRY

NPR S&H<[hodmathematicsnprcet@gmail.com](mailto:hodmathematicsnprcet@gmail.com)>

Mon, DEC 13, 2021,

To: [info@veitechnologies.com](mailto:info@veitechnologies.com)

10.16 AM

Respected Sir,

Greetings...!

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Thanks, and regards

Dr. T. Priya,

Prof & HOD,

Department of Science and Humanities,

NPRCET,

Natham.



Reply Forward

Gmail

Inbox

[info@veitechnologies.com](mailto:info@veitechnologies.com)

Wed, Dec 15, 2021, 12.28 PM

To: [hodmathematicsnprcet@gmail.com](mailto:hodmathematicsnprcet@gmail.com)

Dear Madam,

We are happy to give permission for the industrial visit to your wards in VEI Technologies, Chennai. Kindly remind us one day in advance for the visit schedule also send the original letter copy with your hand during the visit.

Thanks and Regards,

Dr B Ezhilavan,

Managing Director,

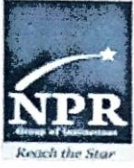
VEI Technologies, Chennai.



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## Industrial Visit to VEI Technologies, Chennai

### DEPARTMENT OF SCIENCE AND HUMANITIES

#### STUDENTS LIST

PLACE OF INDUSTRIAL VISIT: VEI Technologies, Chennai

DATE: 18.12.2021

| S. NO | NAME OF THE STUDENT | DEPARTMENT | GENDER | SIGNATURE          |
|-------|---------------------|------------|--------|--------------------|
| 1.    | JEEVADHARANI P      | EEE        | FEMALE | Jeevadharani P     |
| 2.    | LOGESH KUMAR B      | EEE        | MALE   | Logesh Kumar B     |
| 3.    | LOGESHWARAN S       | EEE        | MALE   | Logeshwaran S      |
| 4.    | MOHAMED THOUFEEK    | EEE        | MALE   | Mohamed Thoufeek   |
| 5.    | RAMYA M             | EEE        | FEMALE | Ramyam             |
| 6.    | SANTHOSH A          | EEE        | MALE   | Santhosh A         |
| 7.    | SANTHOSH KUMAR R    | EEE        | MALE   | Santhosh Kumar R   |
| 8.    | JEYAVARTYIHINI      | EEE        | FEMALE | Jeyavartyihini     |
| 9.    | KEERTHIKA P         | EEE        | FEMALE | Keerthika P        |
| 10.   | LAARADOLLY S        | EEE        | FEMALE | Laaradolly S       |
| 11.   | KIRTHIKANANTH M     | CSE        | MALE   | Kirthikananth M    |
| 12.   | MOHAMMED ABDULA S   | CSE        | MALE   | Mohammed Abdula S  |
| 13.   | MUTHUARIVU K        | CSE        | MALE   | Muthuarivu K       |
| 14.   | PRAVEEN C           | CSE        | MALE   | Praveen C          |
| 15.   | RAGHUL S P          | CSE        | MALE   | Raghul S P         |
| 16.   | AARIF H             | CSE        | MALE   | Aarif H            |
| 17.   | AJAY KUMAR K        | CSE        | MALE   | Ajay Kumar K       |
| 18.   | ANBARASAN P         | CSE        | MALE   | Anbarasan P        |
| 19.   | ANBARASU S          | CSE        | MALE   | Anbarasu S         |
| 20.   | ANBULINGAM E        | CSE        | MALE   | Anbulingam E       |
| 21.   | APSARA JASMINE S    | CSE        | FEMALE | Apsara Jasmine S   |
| 22.   | ARASUTHANGAPANDI M  | CSE        | MALE   | Arasuthangapandi M |
| 23.   | ARUSHA BANU A       | CSE        | FEMALE | Arusha Banu A      |
| 24.   | BABY SHALINI C      | CSE        | FEMALE | Baby Shalini C     |
| 25.   | DHARANI T           | CSE        | FEMALE | Dharani T          |
| 26.   | SUSMITHA N          | CSE        | FEMALE | Susmitha N         |
| 27.   | THESHAN BANU S      | CSE        | FEMALE | Theshan Banu S     |
| 28.   | DHARANI R           | ECE-A      | FEMALE | Dharani R          |
| 29.   | DHARSHINI B         | ECE-A      | FEMALE | Dharshini B        |
| 30.   | DIVYA DHARSINI G    | ECE-A      | FEMALE | Divya Dharsini G   |
| 31.   | DURGA S             | ECE-A      | FEMALE | Durga S            |
| 32.   | GANESAN M           | ECE-A      | MALE   | Ganesan M          |
| 33.   | GOPINATH S          | ECE-A      | MALE   | Gopinath S         |
| 34.   | HARESHKUMAR K       | ECE-A      | MALE   | Hareshkumar K      |
| 35.   | HARIHARAN R         | ECE-A      | MALE   | Hariharaan R       |
| 36.   | MOHAMED IMTHIYAS K  | ECE-A      | MALE   | Mohamed Imthiyas K |



|     |                       |       |        |  |
|-----|-----------------------|-------|--------|--|
| 37. | MOHAMMED HISSAM R     | ECE-A | MALE   |  |
| 38. | MOKESH NANDHU P       | ECE-A | MALE   |  |
| 39. | MUKESH VARMA M        | ECE-A | MALE   |  |
| 40. | NACHAMMAI C           | ECE-A | FEMALE |  |
| 41. | AAKASH R              | ECE-A | MALE   |  |
| 42. | ABDUL RAHMAN A        | ECE-A | MALE   |  |
| 43. | ABHISHEK S            | ECE-A | MALE   |  |
| 44. | ALAGU PANDI P         | ECE-A | MALE   |  |
| 45. | ASHOK KUMAR S         | ECE-A | MALE   |  |
| 46. | BALURATHINAM B T      | ECE-A | MALE   |  |
| 47. | BHUWANESHWARAN B      | ECE-A | MALE   |  |
| 48. | CHINRAMAN V           | ECE-A | MALE   |  |
| 49. | DHANANJEYAN M         | ECE-A | MALE   |  |
| 50. | HARISHBALAJI E        | ECE-A | MALE   |  |
| 51. | HEMANTH BALA M        | ECE-A | MALE   |  |
| 52. | IMRANA Y              | ECE-A | MALE   |  |
| 53. | JOSEPH SAMUEL M       | ECE-A | MALE   |  |
| 54. | KALEESHWARAN M        | ECE-A | MALE   |  |
| 55. | KARTHICK B            | ECE-A | MALE   |  |
| 56. | LAKSHMANADHASAN S     | ECE-A | MALE   |  |
| 57. | LAKSHMANAN K          | ECE-A | MALE   |  |
| 58. | MANIKANDAN G          | ECE-A | MALE   |  |
| 59. | MANIKANDAN N          | ECE-A | MALE   |  |
| 60. | MANOJ KUMAR S         | ECE-A | MALE   |  |
| 61. | MELVIN MECVAAN J      | ECE-A | MALE   |  |
| 62. | MOHAMED BARUK S       | ECE-A | MALE   |  |
| 63. | SARANYA               | ECE-B | MALE   |  |
| 64. | PRIYA DHARSHINI S     | ECE-B | MALE   |  |
| 65. | SANGILI PERUMAL M     | ECE-B | MALE   |  |
| 66. | SIVA BALAN S          | ECE-B | MALE   |  |
| 67. | SIVABALAJI M          | ECE-B | MALE   |  |
| 68. | SUBASH CHANDRA BOSE S | ECE-B | MALE   |  |
| 69. | NEHA A                | ECE-B | FEMALE |  |
| 70. | NITHISHKUMAR K        | ECE-B | MALE   |  |
| 71. | NITHYASRI R           | ECE-B | FEMALE |  |
| 72. | PARTHA SARATHI K      | ECE-B | MALE   |  |
| 73. | NADHIYA M             | ECE-B | FEMALE |  |
| 74. | TAMILARASI C          | ECE-B | FEMALE |  |
| 75. | RAGUL M               | ECE-B | MALE   |  |
| 76. | RAMAPRABAKARAN R      | ECE-B | MALE   |  |
| 77. | RAMJI M               | ECE-B | MALE   |  |
| 78. | RAVIKUMAR S           | ECE-B | MALE   |  |
| 79. | SABARI PRASATH P      | ECE-B | MALE   |  |
| 80. | SAKTHI PRASANNA M     | ECE-B | MALE   |  |

HOD-I YEAR  
(Con. Pita)



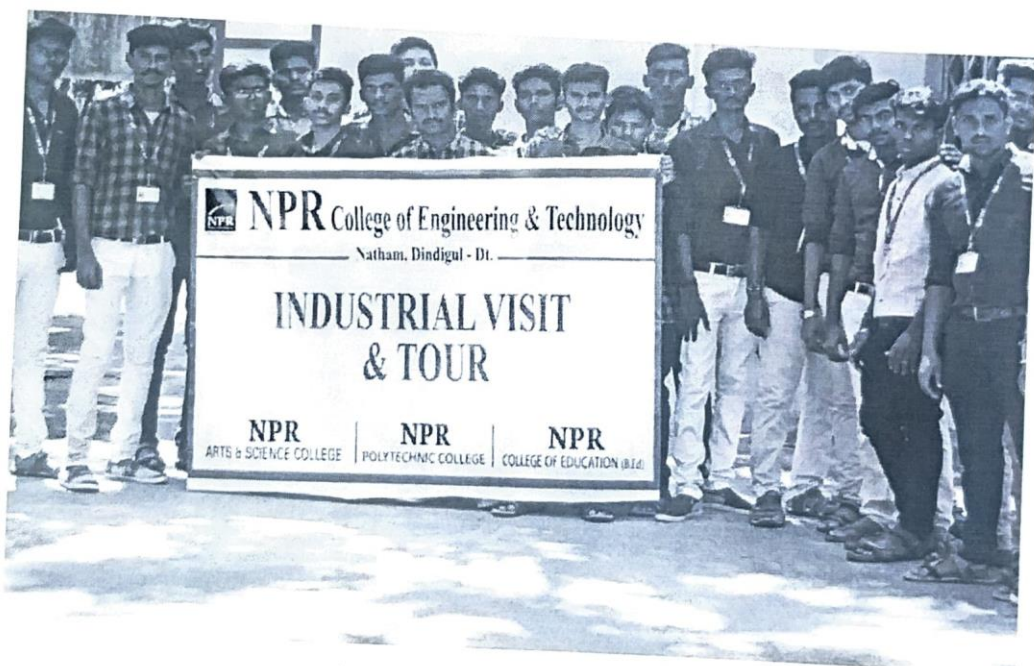
PRINCIPAL  
**Dr. JSUNDARARAJAN,**  
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|  |  |   |
|--|--|---|
|  <p><b>NPR</b><br/>Group of Institutions<br/>Reach the Star</p> | <h1 style="text-align: center;">NPR College of Engineering &amp; Technology</h1> <p style="text-align: center;">NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.<br/>Approved by AICTE, New Delhi &amp; Affiliated to Anna University, Chennai.<br/>An ISO 9001:2015 Certified Institution.<br/>Phone No: 04544- 246 500, 246501, 246502.<br/>Website : <a href="http://www.nprcolleges.org">www.nprcolleges.org</a>, <a href="http://www.nprcet.org">www.nprcet.org</a>, Email <a href="mailto:nprcetprincipal@nprcolleges.org">nprcetprincipal@nprcolleges.org</a></p> |  |
|--|--|---|

## Industrial Visit to VEI Technologies, Chennai

### PHOTO GALLERY



Students are standing in front of VEI Technologies



  
**Dr. J.SUNDARARAJAN,**  
 B.E., M.Tech, Ph.D.,  
 Principal  
 N.P.R. College of Engineering & Technology  
 Natham, Dindigul (Dt) - 624 401.

|   |  |   |
|---|--|---|
|  | <h2 style="text-align: center;">NPR College of Engineering &amp; Technology</h2> <p style="text-align: center;">NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.<br/>         Approved by AICTE, New Delhi &amp; Affiliated to Anna University, Chennai.<br/>         An ISO 9001:2015 Certified Institution.<br/>         Phone No: 04544- 246 500, 246501, 246502.<br/>         Website : www.nprcolleges.org, www.nprcet.org, Email:nprcetprincipal@nprcolleges.org</p> |  |
|---|--|---|

### Industrial Visit to VEI Technologies, Chennai

#### SUMMARY REPORT

The purpose of the visit was to provide the students with an opportunity to gain practical knowledge about the functioning of an industry and its various departments. The visit was attended by a I year Students from NPR CET and took place on December.18<sup>th</sup>.2021. We were picked up from NPR CET at 9:30 pm and travelled by bus to Chennai. We reached Chennai at 6:00 am and returned to NPR CET at 5:00 am the next day.

VEI Technologies, is R&D company with proficient web development and software solution company based in Chennai. They offer an extensive range of services to reach our targeted spectators and carve up our valuable information focusing on retaining their customers.

From 9:00 am to 12:00 pm, the students visited VEI Technologies and were given a guided tour of the facility. They were able to see the various departments in action and understand the working of the industry.


We met the Director of the company, Mr. Babu Ezhilavan, Poonamallee, Chennai, where the company staff explained about some of their services, Web application development, Website designing, corporate profiles and presentations, E-commerce solutions, Application development, maintenance, and re-engineering, Mail gateways, Web hosting solutions, Search Engine Optimization, and Flash development.

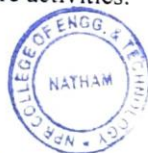
They interacted with students very well and gave us an insight about the value added courses they provide on IOT, Java and Python. Students are also asked some questions regarding the courses to them and cleared their doubts.

From 12:00 pm to 1:00 pm, the students had their lunch at a nearby restaurant. From 1:00 pm to 3:00 pm, the students visited the planetarium, followed by a visit to the zoo from 3:00 pm to 5:00 pm, and then a visit to the beach from 5:00 pm to 6:30 pm. The students started to return at 8:00 pm and reached NPRCET at 5:00 am the next day.

Overall, the industrial visit to VEI Technologies in Chennai was a valuable experience for the students to understand the practical aspects of an industry and its functioning. The visit was well-organized and provided a good balance between the industrial visit and leisure activities.

1. S. Visithug.  
 2. P. Madasamy  
 Faculty Co-ordinators

  
 HOD-I Year  
 (Dr. P. Raja)



  
 IQAC

Coordinator - IQAC  
 NPR College of Engineering & Technology,  
 Natham, Dindigul (Dt)-624

  
 Principal  
**Dr. J. SUNDARARAJAN,**  
 B.E., M.Tech., Ph.D.,  
 Principal  
 NPR College of Engineering & Technology

1. S. Visithua, AP/Maths  
 2. P. Madasamy, AP/Maths

EE8351

DIGITAL LOGIC CIRCUITS

L T P C  
2 2 0 3

**OBJECTIVES:**

- To study various number systems and simplify the logical expressions using Boolean functions
- To study combinational circuits
- To design various synchronous and asynchronous circuits.
- To introduce asynchronous sequential circuits and PLDs
- To introduce digital simulation for development of application oriented logic circuits.

**UNIT I NUMBER SYSTEMS AND DIGITAL LOGIC FAMILIES 6+6**

Review of number systems, binary codes, error detection and correction codes (Parity and Hamming code) - Digital Logic Families - comparison of RTL, DTL, TTL, ECL and MOS families - operation, characteristics of digital logic family.

**UNIT II COMBINATIONAL CIRCUITS**

6+6

Combinational logic - representation of logic functions-SOP and POS forms, K-map representations - minimization using K maps - simplification and implementation of combinational logic – multiplexers and de multiplexers - code converters, adders, subtractors, Encoders and Decoders.

**UNIT III SYNCHRONOUS SEQUENTIAL CIRCUITS**

6+6

Sequential logic- SR, JK, D and T flip flops - level triggering and edge triggering - counters - asynchronous and synchronous type - Modulo counters - Shift registers - design of synchronous sequential circuits – Moore and Melay models- Counters, state diagram; state reduction; state assignment.

**UNIT IV ASYNCHRONOUS SEQUENTIAL LOGIC CIRCUITS**

6+6

Asynchronous sequential logic circuits-Transition stability, flow stability-race conditions, hazards & errors in digital circuits; analysis of asynchronous sequential logic circuits- introduction to Programmability Logic Devices: PROM – PLA –PAL, CPLD-FPGA.

**UNIT V VHDL**

6+6

RTL Design – combinational logic – Sequential circuit – Operators – Introduction to Packages – Subprograms – Test bench. (Simulation /Tutorial Examples: adders, counters, flip flops, Multiplexers & Demultiplexers).

**TOTAL: 60 PERIODS**



## OUTCOMES:

- Ability to design combinational and sequential Circuits.
- Ability to simulate using software package.
- Ability to study various number systems and simplify the logical expressions using Boolean functions
- Ability to design various synchronous and asynchronous circuits.
- Ability to introduce asynchronous sequential circuits and PLDs
- Ability to introduce digital simulation for development of application oriented logic circuits.

## TEXT BOOKS:

1. James W. Bignel, Digital Electronics, Cengage Learning, 5th Edition, 2007.
2. M. Morris Mano, 'Digital Design with an introduction to the VHDL', Pearson Education, 2013.
3. Comer "Digital Logic & State Machine Design, Oxford, 2012.

## REFERENCES

1. Mandal, "Digital Electronics Principles & Application, McGraw Hill Edu, 2013.
2. William Keitz, Digital Electronics-A Practical Approach with VHDL, Pearson, 2013.
3. Thomas L. Floyd, 'Digital Fundamentals', 11th edition, Pearson Education, 2015.
4. Charles H. Roth, Jr, Lizy Lizy Kurian John, 'Digital System Design using VHDL, Cengage, 2013.
5. D.P. Kothari, J.S. Dhillon, 'Digital circuits and Design', Pearson Education, 2016.



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.



Date: 01-10-2021

To

The Principal,  
NPR College of Engineering & Technology,  
Natham.

Dear Sir,

Sub: Permission for In-Plant Training-reg

Ref: NPRCET/OFF/EEE/IPT-02/2021-2022 dated: 28-09-2021.

With reference to your letter cited above, we are pleased to give permission for Mr. LOGESHWARAN N (920819105007), Mr. PITCHIYATHA D (920819105009), Mr. POORNAKUMAR (920819105010), Mr. RAJAMURUGAN M (920819105012), Mr. RAJASEKAR M (920819105013) of Third year Electrical and Electronics Engineering of your institution to undergo In-Plant Training in our organization from 05.10.2021 to 16.10.2021.

Thank you.

Yours truly,  
For Megatronics




(C.Kannan)

**Megatronics**

EO, H.K. Mills 'B' Colony, Pochampalayal, Coimbatore - 641 024.  
Cell : 98422-65001 Phone : 9422 - 256 5001 E-mail : megatronicsindia@gmail.com  
Web : www.megatronicsindia.in



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

Date: 16-10-2021

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that the students of Third year EEE of NPR College of Engineering & Technology, Natham has successfully done the In-Plant training in our concern from 05.10.2021 to 16.10.2021.

During this period their conduct was sincere and hardworking.

| S. No. | Name of the Student | Register Number | Year & Branch |
|--------|---------------------|-----------------|---------------|
| 1.     | Mr. LOGESHWARAN N   | 920819105007    | III EEE       |
| 2.     | Mr. PITCHIYATHA D   | 920819105009    | III EEE       |
| 3.     | Mr. POORNAKUMAR V   | 920819105010    | III EEE       |
| 4.     | Mr. RAJAMURUGAN M   | 920819105012    | III EEE       |
| 5.     | Mr. RAJASEKAR M     | 920819105013    | III EEE       |

Yours truly,  
For Megatronics



(C.Kannan)

**Megatronics**

65, H.K. Mills 'B' Colony, Pochampalayur, Coimbatore - 641 004  
Cell : 96422-85001 Phone : 0422 - 256 0001 E-mail : megatronicsindia@gmail.com  
Web : www.megatronicsindia.in



**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal

N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

EE8391

**ELECTROMAGNETIC THEORY**

**L T P C**  
**2 2 0 3**

**OBJECTIVES:**

- To introduce the basic mathematical concepts related to electromagnetic vectorfields
- To impart knowledge on the concepts of
  - Electrostatic fields, electrical potential, energy density and their applications.
  - Magneto static fields, magnetic flux density, vector potential and its applications.
  - Different methods of emf generation and Maxwell's equations
  - Electromagnetic waves and characterizing parameters

**UNIT I ELECTROSTATICS– I 6+6**

Sources and effects of electromagnetic fields – Coordinate Systems – Vector fields – Gradient, Divergence, Curl – theorems and applications - Coulomb's Law – Electric field intensity – Field due to discrete and continuous charges – Gauss's law and applications.

**UNIT II ELECTROSTATICS– II 6+6**

Electric potential – Electric field and equipotential plots, Uniform and Non-Uniform field, Utilization factor – Electric field in free space, conductors, dielectrics - Dielectric polarization – Dielectric strength - Electric field in multiple dielectrics – Boundary conditions, Poisson's and Laplace's equations, Capacitance, Energy density, Applications.

**UNIT III MAGNETOSTATICS 6+6**

Lorentz force, magnetic field intensity (H) – Biot–Savart's Law - Ampere's Circuit Law – H due to straight conductors, circular loop, infinite sheet of current, Magnetic flux density (B) – B in free space, conductor, magnetic materials – Magnetization, Magnetic field in multiple media – Boundary conditions, scalar and vector potential, Poisson's Equation, Magnetic force, Torque, Inductance, Energy density, Applications.

**UNIT IV ELECTRODYNAMIC FIELDS 6+6**

Magnetic Circuits - Faraday's law – Transformer and motional EMF – Displacement current - Maxwell's equations (differential and integral form) – Relation between field theory and circuit theory – Applications.

**UNIT V ELECTROMAGNETIC WAVES 6+6**

Electromagnetic wave generation and equations – Wave parameters; velocity, intrinsic impedance, propagation constant – Waves in free space, lossy and lossless dielectrics, conductors- skin depth - Poynting vector – Plane wave reflection and refraction.

**TOTAL : 60 PERIODS**



## OUTCOMES:

- Ability to understand the basic mathematical concepts related to electromagnetic vector fields.
- Ability to understand the basic concepts about electrostatic fields, electrical potential, energy density and their applications.
- Ability to acquire the knowledge in magneto static fields, magnetic flux density, vector potential and its applications.
- Ability to understand the different methods of emf generation and Maxwell's equations
- Ability to understand the basic concepts electromagnetic waves and characterizing parameters
- Ability to understand and compute Electromagnetic fields and apply them for design and analysis of electrical equipment and systems

## TEXT BOOKS:

1. Mathew N. O. Sadiku, 'Principles of Electromagnetics', 6th Edition, Oxford University Press Inc. Asian edition, 2015.
2. William H. Hayt and John A. Buck, 'Engineering Electromagnetics', McGraw Hill Special Indian edition, 2014.
3. Kraus and Fleish, 'Electromagnetics with Applications', McGraw Hill International Editions, Fifth Edition, 2010.

## REFERENCES

1. V.V.Sarwate, 'Electromagnetic fields and waves', First Edition, Newage Publishers, 1993.
2. J.P.Tewari, 'Engineering Electromagnetics - Theory, Problems and Applications', Second Edition, Khanna Publishers.
3. Joseph. A. Edminister, 'Schaum's Outline of Electromagnetics, Third Edition (Schaum's Outline Series), McGraw Hill, 2010.
4. S.P.Ghosh, Lipika Datta, 'Electromagnetic Field Theory', First Edition, McGraw Hill Education (India) Private Limited, 2012.
5. K A Gangadhar, 'Electromagnetic Field Theory', Khanna Publishers; Eighth Reprint: 2015



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.





ANNA UNIVERSITY: CHENNAI 600 025  
BONAFIDE CERTIFICATE

Certified that this project report " GOOGLE ASSISTANT BASED SMART HOME " is the Bonafide work of " M. DEENA KARTHICK (9208180105002), C. MANIVEL. (920818105004) " who carried out the project work under my supervision.

  
SIGNATURE

Dr. K. KANNIRAJAN, M.E., Ph. D,  
HEAD OF THE DEPARTMENT  
PROFESSOR  
DEPARTMENT OF ELECTRICAL  
AND ELECTRONICS  
ENGINEERING  
NATHAM, DINDIGUL-624401

  
SIGNATURE

Dr. K. VIJAYAKUMAR, M.E., Ph.D,  
SUPERVISOR  
PROFESSOR  
DEPARTMENT OF ELECTRICAL  
AND ELECTRONICS  
ENGINEERING  
NATHAM, DINDIGUL-624401

Submitted for the ANNA UNIVERSITY Project viva-voce examination held on 23/04/2022. at NPR College of Engineering and Technology, Natham.

  
INTERNAL EXAMINER

  
EXTERNAL EXAMINER



  
Dr. J.SUNDARARAJAN,  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.



## ABSTRACT

This project presents a proposal for home automation using voice via Google Assistant. Home automation or demotic's a term for home automation coined by Jim Hill has been evolving drastically. We saw many home automation technologies introduced over these years from Zigbee automation to Amazon Echo, Google Home and Home from Apple. The system is implemented using ordinary household appliances Natural language voice commands are given to the Google Assistant and with the help of IFTTT (If This Then That) application and the Blynk application the commands are decoded and then sent to the microcontroller, the microcontroller in turn controls the relays connected to it as required, turning the device connected to the respective relay On or OFF as per the users request to the Google Assistant. The microcontroller used is Node MCU (ESP8266) and the communication between the microcontroller and the application is established via Wi-Fi (Internet).



  
**Dr. J.SUNDARARAJAN,**

B.E., M.Tech., Ph.D.,

Principal

N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

## CHAPTER 7 CONCLUSION

In this project, commands are given to the Telegram bot. Home appliances like Bulb, Fan and Motor etc., are controlled according to the given commands. The commands given through the Telegram bot are decoded and then sent to the microcontroller and it control the relays. The device connected to the respective relay turned On or OFF as per the users request to the Google Assistant. The microcontroller used is Node MCU (ESP8266) and the communication between the microcontroller and the application is established via Wi-Fi (Internet). There has been tremendous growth in the home automation sector, and many reputed companies utilizing their opportunity to work with IFTTT to deliver an elegant way to connect families to their homes. Consumers are looking to secure their home environment in today's unpredictable world, and the new Home automation service gives them the peace of mind that they need to protect their family's well-being. This project is about wireless home automation using Android mobile helps us to implement such a fantastic system in our home at a very reasonable price using cost-effective devices. Thus, it overcomes many problems like costs, inflexibility, security etc. In addition, will provide greater advantages like it decrease our energy costs, it improves home security. In addition, it is very convenient to use and will improve the comfort of our home. The project has proposed the idea of smart homes that can support a lot of home automation systems. C# programming language and Node microcontroller have been used to connect the sensors circuit to the home.



56

  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

**OBJECTIVES:**

To impart knowledge on the following Topics

- Magnetic-circuit analysis and introduce magnetic materials
- Constructional details, the principle of operation, prediction of performance, the methods of testing the transformers and three phase transformer connections.
- Working principles of electrical machines using the concepts of electromechanical energy conversion principles and derive expressions for generated voltage and torque developed in all Electrical Machines.
- Working principles of DC machines as Generator types, determination of their no-load/load characteristics, starting and methods of speed control of motors.
- Various losses taking place in D.C. Motor and to study the different testing methods to arrive at their performance.

**UNIT I                    MAGNETIC CIRCUITS AND MAGNETIC MATERIALS                    6+6**

Magnetic circuits – Laws governing magnetic circuits - Flux linkage, Inductance and energy – Statically and Dynamically induced EMF - Torque – Properties of magnetic materials, Hysteresis and Eddy Current losses - AC excitation, introduction to permanent magnets- Transformer as a magnetically coupled circuit.

**UNIT II                    TRANSFORMERS                    6+6**

Construction – principle of operation – equivalent circuit parameters – phasor diagrams, losses – testing – efficiency and voltage regulation - all day efficiency - Sumpner's test, per unit representation – inrush current - three phase transformers-connections – Scott Connection – Phasing of transformer – parallel operation of three phase transformers- auto transformer – tap changing transformers- tertiary winding.

**UNIT III                    ELECTROMECHANICAL ENERGY CONVERSION AND CONCEPTS                    6+6  
IN ROTATING MACHINES**

Energy in magnetic system – Field energy and co energy-force and torque equations – singly and multiply excited magnetic field systems-mmf of distributed windings – Winding Inductances-, magnetic fields in rotating machines – rotating mmf waves – magnetic saturation and leakage fluxes.



#### UNIT IV DC GENERATORS

6+6

Construction and components of DC Machine – Principle of operation - Lap and wave windings-EMF equations– circuit model – armature reaction –methods of excitation-commutation - interpoles compensating winding –characteristics of DC generators.

#### UNITV DC MOTORS

6+6

Principle and operations - types of DC Motors – Speed Torque Characteristics of DC Motors-starting and speed control of DC motors –Plugging, dynamic and regenerative braking- testing and efficiency – Retardation test- Swinburne’s test and Hopkinson’s test - Permanent Magnet DC (PMDC)motors-applications ofDC Motor

**TOTAL: 60 PERIODS**

#### OUTCOMES:

- Ability to analyze the magnetic-circuits.
- Ability to acquire the knowledge in constructional details of transformers.
- Ability to understand the concepts of electromechanical energy conversion.
- Ability to acquire the knowledge in working principles of DC Generator.
- Ability to acquire the knowledge in working principles of DC Motor
- Ability to acquire the knowledge in various losses taking place in D.C.Machines

#### TEXT BOOKS:

1. Stephen J. Chapman, 'Electric Machinery Fundamentals' 4<sup>th</sup> edition, McGraw Hill Education Pvt. Ltd, 2010.
2. P.C. Sen 'Principles of Electric Machines and Power Electronics' John Wiley & Sons; 3rd Edition 2013.
3. Nagrath, I.J. and Kothari.D.P., 'Electric Machines', McGraw-Hill Education, 2004

#### REFERENCES

1. Theodore Wildi, "Electrical Machines, Drives, and Power Systems", Pearson Education., (5th Edition), 2002.
2. B.R. Gupta, 'Fundamental of Electric Machines' New age International Publishers, 3<sup>rd</sup> Edition, Reprint 2015.
3. S.K. Bhattacharya, 'Electrical Machines' McGraw - Hill Education, New Delhi, 3<sup>rd</sup> Edition, 2009.
4. Vincent Del Toro, 'Basic Electric Machines' Pearson India Education, 2016.
5. Surinder Pal Bali, 'Electrical Technology Machines & Measurements, Vol.II, Pearson, 2013.
6. Fitzgerald. A.E., Charles Kingsely Jr, Stephen D.Umans, 'Electric Machinery', Sixth edition, McGraw Hill Books Company, 2003.



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

Date: 10.09.2021

To

The Principal,  
NPR College of Engineering & Technology,  
Natham.

Sir,

Sub: Permission for Internship Training-reg

Ref: NPRCET/OFF/EEE/INT-01/2021-2022 dated: 06.09.2020

With reference to your letter we are pleased to grant permission for Mr. BHARATHIRAJA C (920820105002), Mr. GOVINTHAVASAN A (920820105003), Mr. HARISH G (920820105004), Mr. ISHAS AHAMED A (920820105005) of second year Electrical and Electronics Engineering of your institution to undergo Internship Training in our concern from 15.09.2021 to 25.09.2021.

With Regards

For SUPERFECT SOLUTIONS,

AUTHORIZED SIGNATORY



SUPERFECT SOLUTIONS

Tel: 9025-655-523, Mail: [info@superfectsolutions.com](mailto:info@superfectsolutions.com), Web: [www.superfectsolutions.com](http://www.superfectsolutions.com)



**Dr. J.SUNDARARAJAN,**

B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 40 1.

Date: 25-09-2021

Ref No: SUP/INT/21016

**INTERNSHIP TRAINING CERTIFICATE**

**TO WHOM IT MAY CONCERN**

This is to certify that **Mr. GOVINTHAVASAN A (920820105003)** pursuing his second year EEE at NPR College of Engineering & Technology, Natham, has undergone his Internship Training in our concern **from 15.09.2021 to 25.09.2021.**

We appreciate his participation with interest towards the training program.

For SUPERFECT SOLUTIONS,


  
AUTHORIZED SIGNATORY



SUPERFECT SOLUTIONS

Tel: 9025-655-523, Mail: [info@superfectsolutions.com](mailto:info@superfectsolutions.com), Web: [www.superfectsolutions.com](http://www.superfectsolutions.com)



  
**Dr. J.SUNDARARAJAN,**  
B.E., Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.



Date: 25-09-2021

Ref No: SUP/INT/21016

**INTERNSHIP TRAINING CERTIFICATE**

**TO WHOM IT MAY CONCERN**

This is to certify that **Mr. BHARATHIRAJA C (920820105002)** pursuing his second year EEE at NPR College of Engineering & Technology, Natham, has undergone his Internship Training in our concern from **15.09.2021** to **25.09.2021**.

We appreciate his participation with interest towards the training program.

For SUPERFECT SOLUTIONS,



**AUTHORIZED SIGNATORY**



**SUPERFECT SOLUTIONS**

Tel: 9025-655-523, Mail: [info@superfectsolutions.com](mailto:info@superfectsolutions.com), Web: [www.superfectsolutions.com](http://www.superfectsolutions.com)



**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
NPR College of Engineering & Techno...  
Natham, Dindigul (DQ) - 624 401.

EE8402

**TRANSMISSION AND DISTRIBUTION**

**L T P C**  
**3 0 0 3**

**OBJECTIVES:**

- To study the structure of electric power system and to develop expressions for the computation of transmission line parameters.
- To obtain the equivalent circuits for the transmission lines based on distance and to determine voltage regulation and efficiency.
- To understand the mechanical design of transmission lines and to analyze the voltage distribution in insulator strings to improve the efficiency.
- To study the types, construction of cables and methods to improve the efficiency.
- To study about distribution systems, types of substations, methods of grounding, EHVAC, HVDC and FACTS.

**UNIT I TRANSMISSION LINE PARAMETERS 9**

Structure of Power System - Parameters of single and three phase transmission lines with single and double circuits - Resistance, inductance and capacitance of solid, stranded and bundled conductors, Symmetrical and unsymmetrical spacing and transposition - application of self and mutual GMD; skin and proximity effects - Typical configurations, conductor types and electrical parameters of EHV lines.

**UNIT II MODELLING AND PERFORMANCE OF TRANSMISSION LINES 9**

Performance of Transmission lines - short line, medium line and long line - equivalent circuits, phasor diagram, attenuation constant, phase constant, surge impedance - transmission efficiency and voltage regulation, real and reactive power flow in lines - Power Circle diagrams - Formation of Corona - Critical Voltages - Effect on Line Performance.

**UNIT III MECHANICAL DESIGN OF LINES 9**

Mechanical design of OH lines - Line Supports - Types of towers - Stress and Sag Calculation - Effects of Wind and Ice loading. Insulators: Types, voltage distribution in insulator string, improvement of string efficiency, testing of insulators.

**UNIT IV UNDER GROUND CABLES 9**

Underground cables - Types of cables - Construction of single core and 3 core cables - Insulation Resistance - Potential Gradient - Capacitance of Single-core and 3 core cables - Grading of cables - Power factor and heating of cables - DC cables.

**UNIT V DISTRIBUTION SYSTEMS 9**

Distribution Systems - General Aspects - Kelvin's Law - AC and DC distributions - Techniques of Voltage Control and Power factor improvement - Distribution Loss - Types of Substations - Methods of Grounding - Trends in Transmission and Distribution: EHVAC, HVDC and FACTS (Qualitative treatment only).

**TOTAL: 45 PERIODS**



## OUTCOMES:

- To understand the importance and the functioning of transmission line parameters.
- To understand the concepts of Lines and Insulators.
- To acquire knowledge on the performance of Transmission lines.
- To understand the importance of distribution of the electric power in power system.
- To acquire knowledge on Underground Cables
- To become familiar with the function of different components used in Transmission and Distribution levels of power system and modelling of these components.

## TEXT BOOKS:

1. D.P.Kothari, I.J. Nagarath, 'Power System Engineering', McGraw-Hill Publishing Company limited, New Delhi, Second Edition, 2008.
2. C.L.Wadhwa, 'Electrical Power Systems', New Academic Science Ltd, 2009.
3. S.N. Singh, 'Electric Power Generation, Transmission and Distribution', Prentice Hall of India Pvt. Ltd, New Delhi, Second Edition, 2011.

## REFERENCES

1. B.R.Gupta, 'Power System Analysis and Design' S. Chand, New Delhi, Fifth Edition, 2008.
2. Luces M.Fualken berry, Walter Coffey, 'Electrical Power Distribution and Transmission', Pearson Education, 2007.
3. Arun Ingole, "power transmission and distribution" Pearson Education, 2017
4. J.Brian, Hardy and Colin R.Bayliss 'Transmission and Distribution in Electrical Engineering', Newnes; Fourth Edition, 2012.
5. G.Ramamurthy, "Handbook of Electrical power Distribution," Universities Press, 2013.



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

Date: 10.09.2021

To

The Principal,  
NPR College of Engineering & Technology,  
Natham.

Sir,

Sub: Permission for Internship Training-reg  
Ref: NPRCET/OFF/EEE/INT-01/2021-2022 dated: 06.09.2020

With reference to your letter we are pleased to grant permission for Mr. BHARATHIRAJA C (920820105002), Mr. GOVINTHAVASAN A (920820105003), Mr. HARISH G (920820105004), Mr. ISHAS AHAMED A (920820105005) of second year Electrical and Electronics Engineering of your institution to undergo Internship Training in our concern from 15.09.2021 to 25.09.2021.

With Regards

For SUPERFECT SOLUTIONS,

  
AUTHORIZED SIGNATORY



**SUPERFECT SOLUTIONS**

Tel: 9025-655-523, Mail: [info@superfectsolutions.com](mailto:info@superfectsolutions.com), Web: [www.superfectsolutions.com](http://www.superfectsolutions.com)



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 40 1.

Date: 25-09-2021

Ref No: SUP/INT/21016

**INTERNSHIP TRAINING CERTIFICATE**

**TO WHOM IT MAY CONCERN**

This is to certify that **Mr. HARISH G (920820105004)** pursuing his second year EEE at NPR College of Engineering & Technology, Natham, has undergone his Internship Training in our concern from **15.09.2021 to 25.09.2021.**

We appreciate his participation with interest towards the training program.

For SUPERFECT SOLUTIONS,



**AUTHORIZED SIGNATORY**



**SUPERFECT SOLUTIONS**

Tel: 9025-655-523, Mail: [info@superfectsolutions.com](mailto:info@superfectsolutions.com), Web: [www.superfectsolutions.com](http://www.superfectsolutions.com)



**Dr. J.SUNDARARAJAN,**  
B.E., P.Tech., Ph.D.,  
Principal  
NPR College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

Date: 25-09-2021

Ref No: SUP/INT/21016

**INTERNSHIP TRAINING CERTIFICATE**

**TO WHOM IT MAY CONCERN**

This is to certify that Mr. ISHAS AHAMED A (920820105005) pursuing his second year EEE at NPR College of Engineering & Technology, Natham, has undergone his Internship Training in our concern from 15.09.2021 to 25.09.2021.

We appreciate his participation with interest towards the training program.

For SUPERFECT SOLUTIONS,



AUTHORIZED SIGNATORY



SUPERFECT SOLUTIONS

Tel: 9025-655-523, Mail: [info@superfectsolutions.com](mailto:info@superfectsolutions.com), Web: [www.superfectsolutions.com](http://www.superfectsolutions.com)



**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.  
Principal  
NPR. College of Engineering & Technology  
Natham, Dindigul (DI) - 624 40 .





### OUTCOMES:

- To acquire knowledge on Basic functional elements of instrumentation
- To understand the concepts of Fundamentals of electrical and electronic instruments
- Ability to compare between various measurement techniques
- To acquire knowledge on Various storage and display devices
- To understand the concepts Various transducers and the data acquisition systems
- Ability to model and analyze electrical and electronic Instruments and understand the operational features of display Devices and Data Acquisition System.

### TEXT BOOKS:

1. A.K. Sawhney, 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2010.
2. J. B. Gupta, 'A Course in Electronic and Electrical Measurements', S. K. Kataria & Sons, Delhi, 2013.
3. Doebelin E.O. and Manik D.N., Measurement Systems – Applications and Design, Special Indian Edition, McGraw Hill Education Pvt. Ltd., 2007.

### REFERENCES

1. H.S. Kalsi, 'Electronic Instrumentation', McGraw Hill, III Edition 2010.
2. D.V.S. Murthy, 'Transducers and Instrumentation', Prentice Hall of India Pvt Ltd, 2015.
3. David Bell, 'Electronic Instrumentation & Measurements', Oxford University Press, 2013.
4. Martin Reissland, 'Electrical Measurements', New Age International (P) Ltd., Delhi, 2001.
5. Alan. S. Morris, Principles of Measurements and Instrumentation, 2nd Edition, Prentice Hall of India, 2003.



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

# Labo Scientific

563, 7<sup>th</sup> Cross Main Road, Srinivasa Nagar, Trichy -620017.  
laboscientificindia@gmail.com, 8667767992



Date:26.03.2022

To

The principal,  
NPR College of Engineering & Technology,  
Natham.

Sir,

Sub: Permission for In-Plant Training-reg

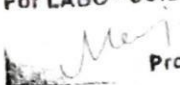
Ref: NPRCET/OFF/EEE/IPT-03/2021-2022dated:22.03.2022.

With reference to your letter we are pleased to grant permission for Mr.AHAMED AFZAR A (920819105001), Mr.ARAVINDKUMAR (920819105002), Mr.GURU PRASATHA (920819105003), Mr.KARTHIKEYAN R(920819105004) of Third year Electrical and Electronics Engineering of your institution to undergo In-Plant training in our concern from 28.03.2022 to 06.04.2022.



  
**Dr. JSUNDARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

With Regards

For LABO - SCIENTIFIC  
  
Proprietor

# Labo Scientific

563, 7<sup>th</sup> Cross Main Road, Srinivasa Nagar, Trichy - 620017.  
laboscientificindia@gmail.com, 8667767992.



Date: 06.04.2022

## TO WHOMSOEVER IT MAY CONCERN

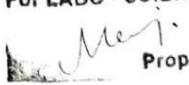
This is to certify that Mr. AHAMED AFZAR M (920819105001) of Third year EEE of NPR College of Engineering & Technology, Natham have successfully done the In-Plant training in our concern from 28.03.2022 to 06.04.2022.

During this period his behavior are good and hardworking.



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

With Regards

For LABO - SCIENTIFIC  
  
Proprietor

# Labo Scientific

563, 7<sup>th</sup> Cross Main Road, Srinivasa Nagar, Trichy -620017.  
laboscientificindia@gmail.com, 8667767992.



Date: 06.04.2022

## TO WHOMSOEVER IT MAY CONCERN

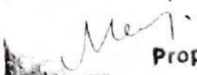
This is to certify that Mr. ARAVINDKUMAR K (920819105002) of Third year EEE of NPR College of Engineering & Technology, Natham have successfully done the In-Plant training in our concern from 28.03.2022 to 06.04.2022.

During this period his behavior are good and hardworking.



  
**Dr. JSUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

With Regards

For LABO - SCIENTIFIC  
  
Proprietor



**OBJECTIVES:**

To impart knowledge on the following topics

- Signal analysis using Op-amp based circuits.
- Applications of Op-amp.
- Functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits.
- IC fabrication procedure.

**UNIT I IC FABRICATION 9**

IC classification, fundamental of monolithic IC technology, epitaxial growth, masking and etching, diffusion of impurities. Realisation of monolithic ICs and packaging. Fabrication of diodes, capacitance, resistance, FETs and PV Cell.

**UNIT II CHARACTERISTICS OF OPAMP 9**

Ideal OP-AMP characteristics, DC characteristics, AC characteristics, differential amplifier; frequency response of OP-AMP; Basic applications of op-amp – Inverting and Non-inverting Amplifiers, summer, differentiator and integrator-V/I & I/V converters.

**UNIT III APPLICATIONS OF OPAMP 9**

Instrumentation amplifier and its applications for transducer Bridge, Log and Antilog Amplifiers- Analog multiplier & Divider, first and second order active filters, comparators, multivibrators, waveform generators, clippers, clampers, peak detector, S/H circuit, D/A converter (R- 2R ladder and weighted resistor types), A/D converters using opamps.

**UNIT IV SPECIAL ICs 9**

Functional block, characteristics of 555 Timer and its PWM application - IC-566 voltage controlled oscillator IC; 565-phase locked loop IC, AD633 Analog multiplier ICs.

**UNIT V APPLICATION ICs 9**

AD623 Instrumentation Amplifier and its application as load cell weight measurement - IC voltage regulators –LM78XX, LM79XX; Fixed voltage regulators its application as Linear power supply - LM317, 723 Variability voltage regulators, switching regulator- SMPS - ICL 8038 function generator IC.

**TOTAL: 45 PERIODS**



## OUTCOMES:

- Ability to acquire knowledge in IC fabrication procedure
- Ability to analyze the characteristics of Op-Amp
- To understand the importance of Signal analysis using Op-amp based circuits.
- Functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits.
- To understand and acquire knowledge on the Applications of Op-amp
- Ability to understand and analyse, linear integrated circuits their Fabrication and Application.

## TEXT BOOKS:

1. David A. Bell, 'Op-amp & Linear ICs', Oxford, 2013.
2. D. Roy Choudhary, Sheil B. Jani, 'Linear Integrated Circuits', II edition, New Age, 2003.
3. Ramakant A. Gayakward, 'Op-amps and Linear Integrated Circuits', I edition, Pearson Education, 2003 / PHI. 2000.

## REFERENCES

1. Fiore, "Opamps & Linear Integrated Circuits Concepts & applications", Cengage, 2010.
2. Floyd, Buchla, "Fundamentals of Analog Circuits, Pearson, 2013.
3. Jacob Millman, Christos C. Halkias, 'Integrated Electronics - Analog and Digital circuits system', McGraw Hill, 2003.
4. Robert F. Coughlin, Fredrick F. Driscoll, 'Op-amp and Linear ICs', Pearson, 6th edition, 2012.
5. Sergio Franco, 'Design with Operational Amplifiers and Analog Integrated Circuits', Mc Graw Hill, 2016.
6. Muhammad H. Rashid, 'Microelectronic Circuits Analysis and Design' Cengage Learning, 2011.



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.



**IOT BASED INDUCTION MOTOR PARAMETERS  
MONITORING AND CONTROLLING**

**A PROJECT REPORT**

*Submitted by*

**M. DHINESH KUMAR      920818105003**

**R. VIGNESHWARAN      920818105701**

*in partial fulfillment for the award of the degree*

*of*

**BACHELOR OF ENGINEERING**

**IN**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**NPR COLLEGE OF ENGINEERING AND TECHNOLOGY,**

**NATHAM**

**ANNA UNIVERSITY: CHENNAI 600 025**

**JUNE 2022**

**Dr. JSUNDARARAJAN,**

**B.E., M.Tech., Ph.D.,**

**Principal**

**N.P.R. College of Engineering & Technology**

**Natham, Dindigul (Dt) - 624 401.**



**ANNA UNIVERSITY: CHENNAI 600 025**

**BONAFIDE CERTIFICATE**

Certified that this project report “**IOT BASED INDUCTION MOTOR PARAMETERS MONITORING AND CONTROLLING**” is the bonafide work of “**M. DHINESH KUMAR (920818105003)**,

**R. VIGNESHWARAN (920818105701)**” who carried out the project work under my supervision.

*[Signature]*  
SIGNATURE 20/6/22

*[Signature]*  
SIGNATURE 20/6/22

Dr. P. KANIRAJAN.,M.E.,Ph.D.

Dr. S. PRAKASH.,M.E.,Ph.D.

HEAD OF THE DEPARTMENT

SUPERVISOR

PROFESSOR

ASSISTANT PROFESSOR

DEPARTMENT OF ELECTRICAL  
AND ELECTRONICS ENGINEERING

DEPARTMENT OF ELECTRICAL  
AND ELECTRONICS ENGINEERING

NATHAM, DINDIGUL-624401

NATHAM, DINDIGUL-624401

Submitted for the Project viva-voice examination held on 23/06/2022

*[Signature]*  
INTERNAL EXAMINER 23/6/22

*[Signature]*  
EXTERNAL EXAMINER 23/6/22

**Dr. J.SUNDARARAJAN,**

B.E., M.Tech., Ph.D.,

Principal

N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

## ABSTRACT

This work tends to develop for protections of three phase induction motor from phase reversal and over temperature. Due to this electrical fault the windings of motor get heated which lead to insulation failure and thus reduce the life time of motor. Thus fault is generated in induction motor due to variation in induction motor parameters. When there is phase induction motor runs continuously, it is necessary to protect the motor from there anticipate faults. Three phase induction motor generally directly connected through the supply, if the supply voltage has sag and swell due to fault the performance of motor is affected and in some cases winding is burned out. When phase sequences is reversed due to wrong connection have then motor start rotating in another directions, if supply system has only one phase and other phase is directly disconnected then it is single phasing problem.

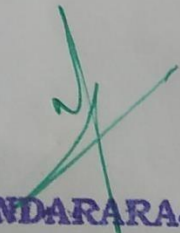
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.



## CHAPTER 6

### CONCLUSION

This project presents the concept of Internet of Things for early detection and monitoring of motor system failures remotely. The system has been designed to combine various parameter measurements in real-time, improving the detectability of different faults. The monitoring of the motor system presents the measurement of different parameters namely vibrations, temperature, voltage and current consumption. Thus, compared to conventional methods that relies solely on vibrations or temperature, this design has more information sources which can enable an alarm. The concept of IoT is presented here for remote monitoring and controlling the motor. The data received by the coordinator node is stored and graphically presented in real-time by means of a application developed in remote device. With the help of this device, it is very easy to have the real time parameters of the Induction motor which will helps us in various aspects leading to the growth of the industry and increase working efficiency of motor.

  
**Dr. JSUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,

Principal

N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

**COURSE OBJECTIVES**

- To understand the use of transfer function models for analysis physical systems and introduce the control system components.
- To provide adequate knowledge in the time response of systems and steady state error analysis.
- To accord basic knowledge in obtaining the open loop and closed-loop frequency responses of systems.
- To introduce stability analysis and design of compensators

|  |   |          |
|--|---|----------|
| <b>UNIT I</b>  | <b>SYSTEMS AND REPRESENTATION</b>       | <b>9</b> |
| Basic elements in control systems: – Open and closed loop systems – Electrical analogy of mechanical and thermal systems – Transfer function – AC and DC servomotors – Block diagram reduction techniques – Signal flow graphs.  |   |          |
| <b>UNIT II</b>   | <b>TIME RESPONSE</b>                    | <b>9</b> |
| Time response: – Time domain specifications – Types of test input – I and II order system response – Error coefficients – Generalized error series – Steady state error – Root locus construction- Effects of P, PI, PID modes of feedback control – Time response analysis. |   |          |
| <b>UNIT III</b>  | <b>FREQUENCY RESPONSE</b>               | <b>9</b> |
| Frequency response: – Bode plot – Polar plot – Determination of closed loop response from open loop response - Correlation between frequency domain and time domain specifications   |   |          |
| <b>UNIT IV</b>   | <b>STABILITY AND COMPENSATOR DESIGN</b> | <b>9</b> |
| Characteristics equation – Routh Hurwitz criterion – Nyquist stability criterion- Performance criteria – Effect of Lag, lead and lag-lead compensation on frequency response-Design of Lag, lead and lag- lead compensator using bode plots.                                 |   |          |
| <b>UNIT V</b>  | <b>STATE VARIABLE ANALYSIS</b>          | <b>9</b> |
| Concept of state variables – State models for linear and time invariant Systems – Solution of state and output equation in controllable canonical form – Concepts of controllability and observability.  |   |          |
| <b>TOTAL (L: 45+T:30): 75 PERIODS</b>  |   |          |

**COURSE OUTCOMES**

At the end of the course, the student should have the :

- Ability to develop various representations of system based on the knowledge of Mathematics, Science and Engineering fundamentals.
- Ability to do time domain and frequency domain analysis of various models of linear system.
- Ability to interpret characteristics of the system to develop mathematical model.
- Ability to design appropriate compensator for the given specifications.
- Ability to come out with solution for complex control problem.
- Ability to understand use of PID controller in closed loop system.



## TEXT BOOKS

1. Nagarath, I.J. and Gopal, M., "Control Systems Engineering", New Age International Publishers, 2017.
2. Benjamin C. Kuo, "Automatic Control Systems", Wiley, 2014.

## REFERENCES

1. Katsuhiko Ogata, "Modern Control Engineering", Pearson, 2015.
2. Richard C. Dorf and Bishop, R.H., "Modern Control Systems", Pearson Education, 2009.
3. John J.D., Azzo Constantine, H. and Houpis Stuart, N Sheldon, "Linear Control System Analysis and Design with MATLAB", CRC Taylor & Francis Reprint 2009.
4. Ramesh C. Panda and T. Thyagarajan, "An Introduction to Process Modelling Identification and Control of Engineers", Narosa Publishing House, 2017.
5. M. Gopal, "Control System: Principle and design", McGraw Hill Education, 2012.
6. NPTEL Video Lecture Notes on "Control Engineering" by Prof. S. D. Agashe, IIT Bombay.



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

# Labo Scientific

563, 7<sup>th</sup> Cross Main Road, Srinivasa Nagar, Trichy -620017.  
laboscientificindia@gmail.com, 8667767992



Date:26.03.2022

To

The principal,  
NPR College of Engineering & Technology,  
Natham.

Sir,

Sub: Permission for In-Plant Training-reg

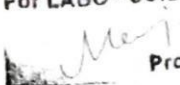
Ref: NPRCET/OFF/EEE/IPT-03/2021-2022dated:22.03.2022.

With reference to your letter we are pleased to grant permission for Mr.AHAMED AFZAR A (920819105001), Mr.ARAVINDKUMAR (920819105002), Mr.GURU PRASATHA (920819105003), Mr.KARTHIKEYAN R(920819105004) of Third year Electrical and Electronics Engineering of your institution to undergo In-Plant training in our concern from 28.03.2022 to 06.04.2022.



  
**Dr. JSUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

With Regards

For LABO - SCIENTIFIC  
  
Proprietor

# Labo Scientific

563, 7<sup>th</sup> Cross Main Road, Srinivasa Nagar, Trichy - 620017.  
laboscientificindia@gmail.com, 8667767992.



Date: 06.04.2022

## TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. GURU PRASATH A (920819105003) of Third year EEE of NPR College of Engineering & Technology, Natham have successfully done the In-Plant training in our concern from 28.03.2022 to 06.04.2022.

During this period his behavior are good and hardworking.



**Dr. JSUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

With Regards

For LABO - SCIENTIFIC  
A handwritten signature in black ink.  
Proprietor



## Labo Scientific

563,7<sup>th</sup> Cross Main Road, Srinivasa Nagar, Trichy -620017.  
laboscientificindia@gmail.com, 8667767992.



Date: 06.04.2022

### TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr.KARTHIKEYAN R (920819105004) of Third year EEE of NPR College of Engineering & Technology, Natham have successfully done the In-Plant training in our concern from 28.03.2022 to 06.04.2022.

During this period his behavior are good and hardworking.



  
**Dr. JSUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

With Regards

For LABO - SCIENTIFIC

  
Proprietor



- Ability to acquire knowledge on Faultanalysis.
- Ability to model and understand various power system components and carryout power flow, short circuit and stabilitystudies.

#### **TEXT BOOKS:**

1. John J. Grainger, William D. Stevenson, Jr, 'Power System Analysis', Mc Graw Hill Education (India) Private Limited, New Delhi,2015.
2. Kothari D.P. and Nagrath I.J., 'Power System Engineering', Tata McGraw-Hill Education, Second Edition,2008.
3. HadiSaadat, 'Power System Analysis', Tata McGraw Hill Education Pvt. Ltd., New Delhi, 21st reprint, 2010.

#### **REFERENCES**

1. Pai M A, 'Computer Techniques in Power System Analysis', Tata Mc Graw-Hill Publishing Company Ltd., New Delhi, Second Edition,2007.
2. J. Duncan Glover, MulukutlaS.Sarma, Thomas J. Overbye, 'Power System Analysis & Design', Cengage Learning, Fifth Edition,2012.
3. Gupta B.R., 'Power System - Analysis and Design', S. Chand Publishing,2001.
4. Kundur P., 'Power System Stability and Control', Tata McGraw Hill Education Pvt. Ltd., New Delhi, 10th reprint,2010.

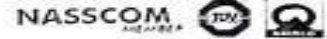


  
**Dr. J.SUNDARARAJAN,**  
 B.E., M.Tech., Ph.D.,  
 Principal  
 N.P.R. College of Engineering & Technology  
 Natham, Dindigul (Dt) - 624 401.



# ELYSIUM TECHNOLOGIES PRIVATE LIMITED

GST No: 33AACCE2334ETZA  
CIN No: U72200TN2006PTC060465




Date: 10.09.2021


To  
The Principal,  
NPR College of Engineering & Technology,  
Natham.

Sir,  
Sub: Permission for In-plant training-reg  
Ref: NPRCET/OFF/EEE/IPT-01/2021-2022 dated: 08.09.2021

With reference to your letter we are pleased to grant permission for Mr. S. Arivuselvan (920818105001), Mr. M. Deena Karthik (920818105002), Mr. M.Dinesh Kumar (920818105003), Mr. C. Manivel (920818105004), Mr. K.M. Sanjay Kishore (920818105006), of final year Electrical and Electronics Engineering of your institution to undergo In-plant training in our concern from 14.09.2021 to 25.09.2021.



  
**Dr. JSUNDARARAJAN,**  
B.E., M.Tech, Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

With Regards  
  
(For Elysium technologies)

+91 - 452 - 4390702, 4392702  
+91 - 994-479-3398

info@elysiumtechnologies.com  
www.elysiumtechnologies.com

227-230, Church Road, Annanagar,  
Madurai-625 020, Tamilnadu, India.



# ELYSIUM TECHNOLOGIES PRIVATE LIMITED

GST No: 33AACCE2334E1ZA  
CIN No: U72200TN2006PTC060485



Date: 25.09.2021

## TO WHOMSOEVER IT MAY CONCERN

This is to certify that the students of final year EEE of NPR College of Engineering & Technology, Natham has successfully done the In-Plant training in our concern from 14.09.2021 to 25.09.2021.

During this period their conduct was sincere and hardworking.

| S. No. | Name of the Student  | Register Number | Year & Branch |
|--------|----------------------|-----------------|---------------|
| 1.     | Mr.S.ARIVUSELVAN     | 920818105001    | IV EEE        |
| 2.     | Mr.M.DEENA KARTHICK  | 920818105002    | IV EEE        |
| 3.     | Mr.M.DINESH KUMAR    | 920818105003    | IV EEE        |
| 4.     | Mr.C.MANIVEL         | 920818105004    | IV EEE        |
| 5.     | Mr.K.M.SANJAY ISHORE | 920818105006    | IV EEE        |



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
NPR College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.



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www.elysiumtechnologies.com

227-230, Church Road, Annanagar,  
Madurai-625 020, Tamilnadu, India.





### OUTCOMES:

- Ability to acquire knowledge in Addressing modes & instruction set of 8085 &8051.
- Ability to need & use of Interrupt structure 8085 &8051.
- Ability to understand the importance of Interfacing
- Ability to explain the architecture of Microprocessor and Microcontroller.
- Ability to write the assembly language programme.
- Ability to develop the Microprocessor and Microcontroller based applications.

### TEXT BOOKS:

1. Sunil Mathur & Jeebananda Panda, "Microprocessor and Microcontrollers", PHI Learning Pvt. Ltd., 2016.
2. R.S. Gaonkar, 'Microprocessor Architecture Programming and Application', with 8085, Wiley Eastern Ltd., New Delhi, 2013.
3. Muhammad Ali Mazidi & Janice Gilli Mazidi, R.D. Kinley 'The 8051 Micro Controller and Embedded Systems', PHI Pearson Education, 5th Indian reprint, 2003.

### REFERENCES

1. Krishna Kant, "Microprocessor and Microcontrollers", Eastern Company Edition, Prentice Hall of India, New Delhi, 2007.
2. B. RAM, "Computer Fundamentals Architecture and Organization" New age International Private Limited, Fifth edition, 2017.
3. Soumitra Kumar Mandal, Microprocessor & Microcontroller Architecture, Programming & Interfacing using 8085, 8086, 8051, McGraw Hill Edu, 2013.
4. Ajay V. Deshmukh, 'Microcontroller Theory & Applications', McGraw Hill Edu, 2016
5. Douglas V. Hall, 'Microprocessor and Interfacing', McGraw Hill Edu, 2016.



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.



**AN INTELLIGENT TRAFFIC LIGHT SYSTEM FOR  
EMERGENCY VEHICLE**

**A PROJECT REPORT**

*Submitted by*

**S. ARIVUSELVAN      920818105001**

**V. MONIKA              920818105005**

*in partial fulfillment for the award of the degree*

*of*

**BACHELOR OF ENGINEERING**

**IN**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**N.P.R. COLLEGE OF ENGINEERING & TECHNOLOGY, NATHAM**

**ANNA UNIVERSITY: CHENNAI 600 025**

**JUNE 2022**

**Dr. JSUNDARARAJAN,**

**B.E., M.Tech., Ph.D.,**

**Principal**

**N.P.R. College of Engineering & Technology**

**Natham, Dindigul (Dt) - 624 401,**



**ANNA UNIVERSITY: CHENNAI 600 025**  
**BONAFIDE CERTIFICATE**

Certified that this project report "AN INTELIGENT TRAFFIC LIGHT SYSTEM FOR EMERGENCY VEHICLE" is the bonafide work of "S. ARIVUSELVAN (920818105001), V. MONIKA (920818105005)" who carried out the project work under my supervision.

*P. Kanirajan*  
SIGNATURE 22/6/22

Dr. P. KANIRAJAN.,M.E.,Ph.D.,  
HEAD OF THE DEPARTMENT  
PROFESSOR

DEPARTMENT OF ELECTRICAL  
AND ELECTRONICS ENGINEERING  
NATHAM, DINDIGUL-624401

*S. Sathyamoorthi*

SIGNATURE

Mr. S. SATHYAMOORTHY, M.E.,(Ph.D).,

SUPERVISOR

ASSISTANT PROFESSOR

DEPARTMENT OF ELECTRICAL AND  
ELECTRONICS ENGINEERING  
NATHAM, DINDIGUL-624401

Submitted for the Project viva-voce examination held on 23/6/22.....

*P. Kanirajan*  
INTERNAL EXAMINER 23/6/22

*Dr. J. Sundararajan*  
EXTERNAL EXAMINER 23/6/22

**Dr. JSUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal

N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

ii

## ABSTRACT

The project is aimed at designing a density based dynamic traffic signal system where the timing of signal will change automatically on sensing the traffic density at any junction. Therefore it is time to shift more manual mode or fixed timer mode to an automated system with decision making capabilities. Present day traffic signaling system is fixed time based which may render inefficient if one lane is operational than the others. To optimize this problem we have made a framework for an intelligent traffic control system. Sometimes higher traffic density at one side of the junction demands longer green time as compared to standard allotted time. We, therefore propose here a mechanism in which the time period of green light and red light is assigned on the basis of the density of the traffic present at that time. This is achieved by using IR(Infrared sensors). Once the density is calculated, the glowing time of green light is assigned by the help of the microcontroller (Arduino). The sensors which are present on sides of the road will detect the presence of the vehicles and sends the information to the microcontroller where it will decide how long a flank will be open or when to change over the signal lights. In subsequent sections, we have elaborated the procedure of this framework. It also supports smart city transportation applications including emergency vehicle signal preemption (EVSP) using RF based ambulance identification.

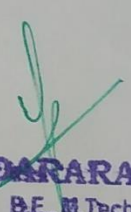
iv

**Dr. ASUDARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.



## CHAPTER-6 CONCLUSION

The project work is aimed that the control of the traffic jams in the roads in the presence of emergency vehicle. As the number of cars is increasing day by day so our traffic control system should change. Number of passing vehicle in the fixed time slot on the road decide the density range of traffic and on the basis of vehicle count microcontroller decide the traffic light delays for next recording interval.

  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

**OBJECTIVES:**

To impart knowledge on the following Topics

- Different types of power semiconductor devices and their switching
- Operation, characteristics and performance parameters of controlled rectifiers
- Operation, switching techniques and basic topologies of DC-DC switching regulators.
- Different modulation techniques of pulse width modulated inverters and to understand harmonic reduction methods.
- Operation of AC voltage controller and various configurations.

**UNIT I POWER SEMI-CONDUCTOR DEVICES 9**

Study of switching devices, SCR, TRIAC, GTO, BJT, MOSFET, IGBT and IGCT- Static characteristics: SCR, MOSFET and IGBT - Triggering and commutation circuit for SCR- Introduction to Driver and snubber circuits.

**UNIT II PHASE-CONTROLLED CONVERTERS 9**

2-pulse, 3-pulse and 6-pulse converters— performance parameters —Effect of source inductance— Firing Schemes for converter—Dual converters, Applications-light dimmer, Excitation system, Solar PV systems.

**UNIT III DC TO DC CONVERTERS 9**

Step-down and step-up chopper-control strategy— Introduction to types of choppers-A, B, C, D and E -Switched mode regulators- Buck, Boost, Buck- Boost regulator, Introduction to Resonant Converters, Applications-Battery operated vehicles.

**UNIT IV INVERTERS 9**

Single phase and three phase voltage source inverters (both  $120^\circ$  mode and  $180^\circ$  mode)— Voltage & harmonic control—PWM techniques: Multiple PWM, Sinusoidal PWM, modified sinusoidal PWM — Introduction to space vector modulation —Current source inverter, Applications-Induction heating, UPS.

**UNIT V AC TO AC CONVERTERS 9**

Single phase and Three phase AC voltage controllers—Control strategy- Power Factor Control — Multistage sequence control -single phase and three phase cyclo converters — Introduction to Matrix converters, Applications —welding .

**TOTAL: 45 PERIODS**



**OUTCOMES:**

- Ability to analyse AC-AC and DC-DC and DC-AC converters.
- Ability to choose the converters for real time applications.

**TEXT BOOKS:**

1. M.H. Rashid, 'Power Electronics: Circuits, Devices and Applications', Pearson Education, Third Edition, New Delhi, 2004.
2. P.S. Bimbra "Power Electronics" Khanna Publishers, third Edition, 2003.
3. Ashfaq Ahmed 'Power Electronics for Technology', Pearson Education, Indian reprint, 2003.

**REFERENCES**

1. Joseph Vithayathil, 'Power Electronics, Principles and Applications', McGraw Hill Series, 6<sup>th</sup> Reprint, 2013.
2. Philip T. Krein, "Elements of Power Electronics" Oxford University Press, 2004 Edition.
3. L. Umanand, "Power Electronics Essentials and Applications", Wiley, 2010.
4. Ned Mohan, Tore M. Undel and, William. P. Robbins, 'Power Electronics: Converters, Applications and Design', John Wiley and sons, third edition, 2003.
5. S. Rama Reddy, 'Fundamentals of Power Electronics', Narosa Publications, 2014.
6. M.D. Singh and K.B. Khanchandani, "Power Electronics," Mc Graw Hill India, 2013.
7. JP Agarwal, "Power Electronic Systems: Theory and Design" 1e, Pearson Education, 2002.



  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
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corporate.umbrella1998@gmail.com  
8015080200

Date: 09.01.2022

To

The Principal,  
NPR College of Engineering & Technology,  
Natham.

Sir,

Sub: Permission for Internship training-reg

Ref: NPRCET/OFF/EEE/INT-04/2021-2022dated:02.01.2022

With reference to your letter we are pleased to grant permission for Mr.Poornakumar.V (920819105011),Mr.M.Rajamurugan M (920519105013), Mr.Sujeethran (920819105015), Mr.Vignesh M (920819105016)of third year Electrical and Electronics Engineering of your institution to undergo Internship training in our concern from 21.01.2022 to 05.02.2022.

With Regards

For UMBRELLA CORPORATION



*P. V. S.*  
Proprietor



**Dr. JSUNDARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal

**NPR College of Engineering & Technology**  
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8015080700.

Date:05.02.2022

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that the students of third year EEE of NPR College of Engineering & Technology, Natham has successfully done the Internship training in our concern from 21.01.2022 to 05.02.2022.

During this period their conduct was sincere and hardworking.

| S. No. | Name of the Student | Register Number | Year & Branch |
|--------|---------------------|-----------------|---------------|
| 1.     | POORNAKUMAR V       | 920819105011    | III EEE       |
| 2.     | RAJAMURUGAN M       | 920819105013    | III EEE       |
| 3.     | SUJEETHRAN S        | 920819105015    | III EEE       |
| 4.     | VIGNESH M           | 920819105016    | III EEE       |

With Regards

For UMBRELLA CORPORATION

Proprietor



**Dr. J.SUNDARARAJAN,**

B.E., M.Tech., Ph.D.,

Principal

N.P.R. College of Engineering & Technology

Natham, Dindigul (Dt) - 624 401.



**OBJECTIVES:**

To impart knowledge on the following Topics

- Building Blocks of EmbeddedSystem
- Various Embedded DevelopmentStrategies
- Bus Communication in processors, Input/outputinterfacing.
- Various processor schedulingalgorithms.
- Basics of Real time operating system and example tutorials to discuss on one real time operating system tool.

**UNIT I INTRODUCTION TOEMBEDDED SYSTEMS 9**

Introduction to Embedded Systems –Structural units in Embedded processor , selection of processor & memory devices- DMA – Memory management methods- Timer and Countingdevices, Watchdog Timer, Real Time Clock, In circuit emulator, Target Hardware Debugging.

**UNITII EMBEDDEDNETWORKING 9**

Embedded Networking: Introduction, I/O Device Ports & Buses– Serial Bus communication protocols RS232 standard – RS422 – RS 485 - CAN Bus -Serial Peripheral Interface (SPI) – Inter Integrated Circuits (I<sup>2</sup>C) –need for device drivers.

**UNITIII EMBEDDED FIRMWAREDEVELOPMENTENVIRONMENT 9**

Embedded Product Development Life Cycle- objectives, different phases of EDLC, Modelling of EDLC; issues in Hardware-software Co-design, Data Flow Graph, state machine model, Sequential Program Model, concurrent Model, object oriented Model.

**UNITIV RTOS BASED EMBEDDED SYSTEMDESIGN 9**

Introduction to basic concepts of RTOS- Task, process & threads, interrupt routines in RTOS, Multiprocessing and Multitasking, Preemptive and non-preemptive scheduling, Task communication shared memory, message passing-, Inter process Communication –synchronization between processes-semaphores, Mailbox, pipes, priority inversion, priority inheritance.

**UNITV EMBEDDED SYSTEM APPLICATIONANDDEVELOPMENT 9**

Case Study of Washing Machine- Automotive Application- Smart card System Application-ATM machine –Digital camera

**TOTAL: 45 PERIODS**

**OUTCOMES:**

- Ability to understand and analyze Embeddedsystems.
- Ability to suggest an embedded system for a givenapplication.
- Ability to operate various Embedded DevelopmentStrategies
- Ability to study about the bus Communication inprocessors.
- Ability to acquire knowledge on various processor schedulingalgorithms.
- Ability to understand basics of Real time operatingsystem.



**TEXT BOOKS:**

1. Peckol, "Embedded system Design", John Wiley & Sons, 2010
2. Lyla B Das, "Embedded Systems-An Integrated Approach", Pearson, 2013
3. Shibu. K.V, "Introduction to Embedded Systems", 2e, Mc Graw Hill, 2017.

**REFERENCES**

1. Raj Kamal, 'Embedded System-Architecture, Programming, Design', Mc Graw Hill, 2013.
2. C.R.Sarma, "Embedded Systems Engineering", University Press (India) Pvt. Ltd, 2013.
3. Tammy Noergaard, "Embedded Systems Architecture", Elsevier, 2006.
4. Han-Way Huang, "Embedded system Design Using C8051", Cengage Learning, 2009.
5. Rajib Mall "Real-Time systems Theory and Practice" Pearson Education, 2007.



  
**Dr. J.SUNDARARAJAN,**  
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**GOOGLE ASSISTANT BASED SMART HOME**

**A PROJECT REPORT**

Submitted by

**M. DEENA KARTHICK            920818105002**

**C. MANIVEL                      920818105004**

In partial fulfillment for the award of the degree of

**BACHELOR OF ENGINEERING**

**IN**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**NPR COLLEGE OF ENGINEERING AND TECHNOLOGY, NATHAM**

**ANNA UNIVERSITY: CHENNAI 600 025**

**JUNE 2022**



**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.



ANNA UNIVERSITY: CHENNAI 600 025

**BONAFIDE CERTIFICATE**

Certified that this project report " **GOOGLE ASSISTANT BASED SMART HOME** " is the Bonafide work of " **M. DEENA KARTHICK (9208180105002), C. MANIVEL (920818105004)** " who carried out the project work under my supervision.

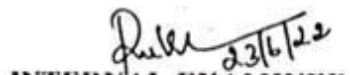
  
SIGNATURE

**Dr. K. KANNIRAJAN, M.E., Ph. D,**  
**HEAD OF THE DEPARTMENT**  
**PROFESSOR**  
**DEPARTMENT OF ELECTRICAL**  
**AND ELECTRONICS**  
**ENGINEERING**  
**NATHAM, DINDIGUL-624401**

  
SIGNATURE

**Dr. K. VIJAYAKUMAR, M.E., Ph.D,**  
**SUPERVISOR**  
**PROFESSOR**  
**DEPARTMENT OF ELECTRICAL**  
**AND ELECTRONICS**  
**ENGINEERING**  
**NATHAM, DINDIGUL-624401**

Submitted for the ANNA UNIVERSITY Project viva-voce examination held on 23/06/2022 at NPR College of Engineering and Technology, Natham.

  
INTERNAL EXAMINER

  
EXTERNAL EXAMINER



  
**Dr. J.SUNDARARAJAN,**  
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## ABSTRACT

This project presents a proposal for home automation using voice via Google Assistant. Home automation or demotic's a term for home automation coined by Jim Hill has been evolving drastically. We saw many home automation technologies introduced over these years from Zigbee automation to Amazon Echo, Google Home and Home from Apple. The system is implemented using ordinary household appliances Natural language voice commands are given to the Google Assistant and with the help of IFTTT (If This Then That) application and the Blynk application the commands are decoded and then sent to the microcontroller, the microcontroller in turn controls the relays connected to it as required, turning the device connected to the respective relay On or OFF as per the users request to the Google Assistant. The microcontroller used is Node MCU (ESP8266) and the communication between the microcontroller and the application is established via Wi-Fi (Internet).



  
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## CHAPTER 7 CONCLUSION

In this project, commands are given to the Telegram bot. Home appliances like Bulb, Fan and Motor etc., are controlled according to the given commands. The commands given through the Telegram bot are decoded and then sent to the microcontroller and it control the relays. The device connected to the respective relay turned On or OFF as per the users request to the Google Assistant. The microcontroller used is Node MCU (ESP8266) and the communication between the microcontroller and the application is established via Wi-Fi (Internet). There has been tremendous growth in the home automation sector, and many reputed companies utilizing their opportunity to work with IFTTT to deliver an elegant way to connect families to their homes. Consumers are looking to secure their home environment in today's unpredictable world, and the new Home automation service gives them the peace of mind that they need to protect their family's well-being. This project is about wireless home automation using Android mobile helps us to implement such a fantastic system in our home at a very reasonable price using cost-effective devices. Thus, it overcomes many problems like costs, inflexibility, security etc. In addition, will provide greater advantages like it decrease our energy costs, it improves home security. In addition, it is very convenient to use and will improve the comfort of our home. The project has proposed the idea of smart homes that can support a lot of home automation systems. C# programming language and Node microcontroller have been used to connect the sensors circuit to the home.



56

  
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**OBJECTIVES:** To impart knowledge about the following topics:

- Switched mode powersupplies
- MatrixConverter
- Soft switched converters

**UNITI SWITCHED MODE POWERSUPPLIES(SMPS) 9**

DC Power supplies and Classification; Switched mode dc power supplies - with and without isolation, single and multiple outputs; Closed loop control and regulation; Design examples on converter and closed loop performance.

**UNITII AC-DCCONVERTERS 9**

Switched mode AC-DC converters. synchronous rectification - single and three phase topologies - switching techniques - high input power factor . reduced input current harmonic distortion. improved efficiency. with and without input-output isolation. performance indices design examples

**UNITIII DC-AC CONVERTERS 9**

Multi-level Inversion - concept, classification of multilevel inverters, Principle of operation, main features and analysis of Diode clamped, Flying capacitor and cascaded multilevel inverters; Modulation schemes.

**UNITIV AC-AC CONVERTERS WITH AND WITHOUTDCLINK 9**

Matrix converters. Basic topology of matrix converter; Commutation – current path; Modulationtechniques-scalarmodulation,indirectmodulation;Matrixconverteronly  
AC-DC converter; AC-AC converter with DC link - topologies and operation - with and without resonance link - converter with dc link converter; Performance comparison with matrix converter with DC link converters.

**UNITV SOFT-SWITCHINGPOWER CONVERTERS 9**

Soft switching techniques. ZVS, ZCS, quasi resonance operation; Performance comparison hard switched and soft switched converters.AC-DC converter, DC-DC converter, DC-AC converter.; Resonant DC power supplies .

**TOTAL: 45 PERIODS**

**OUTCOMES:**

- Ability to suggest converters for AC-DC conversion andSMPS

**TEXT BOOKS:**

1. Power Electronics Handbook, M.H.Rashid, Academic press, New york,2000.
2. Advanced DC/DC Converters, Fang Lin Luo and Fang Lin Luo, CRCPress, NewYork,2004.
3. Control in Power Electronics- Selected Problem, Marian P.Kazmierkowski, R.Krishnan and FredeBlaabjerg, Academic Press (Elsevier Science),2002.



## REFERENCES

1. Power Electronic Circuits, IssaBatarseh, John Wiley and Sons, Inc. 2004
2. Power Electronics for Modern Wind Turbines, FredeBlaabjerg and ZheChen, Morgan & Claypool Publishers series, United States of America, 2006.
3. Krein Philip T, Elements of Power Electronics, Oxford University press, 2008
4. Agarwal, Power Electronics: Converters, Applications, and Design, 3rd edition, JaiP, Prentice Hall, 2000
5. L. Umanand, Power Electronics: Essentials & Applications, John Wiley and Sons, 2009.



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B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.



Date: 18.10.2021

To

The Principal,  
NPR College of Engineering & Technology,  
Natham.


Sir,

Sub: Permission for Internship training-reg

Ref: NPRCET/OFF/EEE/INT-02/2021-2022 dated: 13.10.2021

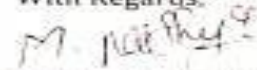
With reference to your letter we are pleased to grant permission for Ms. Brindha R (920820105303), Ms. Geethanjalidevi (920820105305), Ms. Kalaiselvi S (920820105307), Ms. Monika (920820105312) of second year Electrical and Electronics Engineering of your institution to undergo Internship training in our concern from 22.10.2021 to 03.11.2021.



  
Dr. J. SUNDARARAJAN,  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology,  
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With Regards,



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NANO TECH GROUPS

No: 31/588, 5th Cross, Shanmuga Nagar, Uyyakonda Thirumalai, Trichy - 620 102



Date: 03.11.2021

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that the students of second year EEE of NPR College of Engineering & Technology, Natham has successfully done the Internship training in our concern from 22.10.2021 to 03.11.2021.

During this period their conduct was sincere and hardworking.

| S. No. | Name of the Student    | Register Number | Year & Branch |
|--------|------------------------|-----------------|---------------|
| 1.     | Ms. BRINTHA R          | 920820105303    | II EEE        |
| 2.     | Ms. GEETHANJALI DEVI S | 920820105305    | II EEE        |
| 3.     | Ms. KALAI SELVI S      | 920820105307    | II EEE        |
| 4.     | Ms. MONIKA K           | 920820105312    | II EEE        |



**Dr. J.SUNDARARAJAM,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

With Regards,

*M. Raju*  
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**NANO TECH GROUPS**

No: 31/588, 5th Cross, Shanmuga Nagar, Uyyakondan Thirumalai, Trichy - 620 102



**OBJECTIVES:**

To impart knowledge on the following Topics

- Steady state operation and transient dynamics of a motor load system.
- Analyze the operation of the converter/chopper fed dc drive, both qualitatively and quantitatively.
- Operation and performance of AC motor drives.
- Analyze and design the current and speed controllers for a closed loop solid state DC motor drive.

**UNIT I DRIVE CHARACTERISTICS 9**

Electric drive – Equations governing motor load dynamics – steady state stability – multi quadrant Dynamics: acceleration, deceleration, starting & stopping – typical load torque characteristics – Selection of motor.

**UNIT II CONVERTER / CHOPPER FED DC MOTOR DRIVE 9**

Steady state analysis of the single and three phase converter fed separately excited DC motor drive– continuous conduction – Time ratio and current limit control – 4 quadrant operation of converter / chopper fed drive-Applications.

**UNIT III INDUCTION MOTOR DRIVES 9**

Stator voltage control–V/f control– Rotor Resistance control-qualitative treatment of slip power recovery drives-closed loop control– vector control- Applications.

**UNIT IV SYNCHRONOUS MOTOR DRIVES 9**

V/f control and self-control of synchronous motor: Margin angle control and power factor control- Three phase voltage/current source fed synchronous motor- Applications.

**UNIT V DESIGN OF CONTROLLERS FOR DRIVES 9**

Transfer function for DC motor / load and converter – closed loop control with Current and speed feedback–armature voltage control and field weakening mode – Design of controllers; current controller and speed controller- converter selection and characteristics.

**TOTAL : 45 PERIODS**



## OUTCOMES:

- Ability to understand and suggest a converter for solid state drive.
- Ability to select suitability drive for the given application.
- Ability to study about the steady state operation and transient dynamics of a motor load system.
- Ability to analyze the operation of the converter/chopper fed dc drive.
- Ability to analyze the operation and performance of AC motor drives.
- Ability to analyze and design the current and speed controllers for a closed loop solid state DC motor drive.

## TEXT BOOKS:

1. Gopal K.Dubey, Fundamentals of Electrical Drives, Narosa Publishing House, 1992.
2. Bimal K.Bose. Modern Power Electronics and AC Drives, Pearson Education, 2002.
3. R.Krishnan, Electric Motor & Drives: Modeling, Analysis and Control, Pearson, 2001.

## REFERENCES

1. Vedam Subramanyam, " Electric Drives Concepts and Applications ", 2e, McGraw Hill, 2016
2. Shaahin Felizadeh, "Electric Machines and Drives", CRC Press (Taylor and Francis Group), 2013.
3. John Hindmarsh and Alasdain Renfrew, "Electrical Machines and Drives System," Elsevier 2012.
4. Theodore Wildi, " Electrical Machines ,Drives and power systems ,6<sup>th</sup> edition, Pearson Education ,2015
5. N.K. De., P.K. SEN" Electric drives" PHI, 2012.



  
**Dr. J.SUNDARARAJAN,**  
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Natham, Dindigul (Dt) - 624 401.



**BLIND SPOT MONITORING AND ALERT  
FOR DRIVERS**



**A PROJECT REPORT**

*Submitted by*

**ARAVIND KUMAR .K**

**(920819105002)**

**RAJA SEKAR .M**

**(920819105013)**

*In partial fulfillment for the award of the degree*

*of*

**BACHELOR OF ENGINEERING**

**IN**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**NPR COLLEGE OF ENGINEERING AND TECHNOLOGY, NATHAM**

**ANNA UNIVERSITY: CHENNAI 600 025**

**JUNE 2022**



  
**Dr. J.SUNDARARAJAN,**  
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Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.

**BONAFIDE CERTIFICATE**

Certified that this project report **“BLIND SPOT MONITORING AND ALERT FOR DRIVERS”** is the bonafide work of **“ARAVIND KUMAR .K (920819105002) and RAJASEKAR .M (920819105013)”** who carried out the project work under my supervision.

  
SIGNATURE

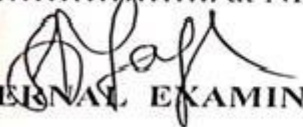
Dr. P.KANIRAJAN, M.E.,Ph.D.  
HEAD OF THE DEPARTMENT  
Professor,  
Electrical and Electronics  
Engineering,  
NPR College of Engineering  
and Technology,  
Natham,  
Dindigul – 624001.

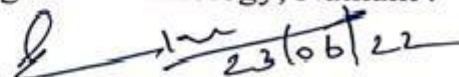
  
SIGNATURE

Mrs. U.SARAYU, M.E.,  
SUPERVISOR  
Assistant Professor,  
Electrical and Electronics  
Engineering,  
NPR college of Engineering  
and Technology,  
Natham,  
Dindigul – 624001.

Submitted for the ANNA UNIVERSITY viva-voce Examination held on

~~23.06.2022~~ at NPR College of Engineering and Technology, Natham .

  
INTERNAL EXAMINER

  
EXTERNAL EXAMINER



i

  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
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Natham, Dindigul (Dt) - 624 401.

## ABSTRACT

In the current ever-growing traffic, security is one of the biggest concerns during travel. From airbags and ABS to EBD and automatic braking, work is on to make road travel more secure by the day. This project describes a design and implementation of an effective alert system to monitor an automobile's condition during travel. It is designed to send out an alert in case the vehicle has met with an accident. Our design of the system uses the in-built Ultra sonic sensor in the Electronic Control Unit to detect the obstacles. This detection and messaging system is composed of buzzer system with automatic speed reduction.



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## CHAPTER 5

### CONCLUSION

The project was successfully implemented. Thus by having this prototype in place we can address an unexplored area of security and safety and thereby contribute towards reducing the death toll numbers which are caused due to road accidents. Our prototype would help accelerate the response from the concerned team thereby resulting in a quicker addressing to the victims of the accidents. This experiment still will require real-life scenario validation. There is a lot of work to be done to see if the presence of such a system can be made a norm in all the vehicles sold and all the commercial vehicles such as buses/trucks plying on our roads. In addition, there is a vast scope for future developments in this field. This system can be expanded to have a high population density warning system for areas such as schools, colleges etc. It could be used to develop a speed limit warning system as well.



  
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Principal  
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Natham, Dindigul (Dt) - 624 401.

**OBJECTIVES:** To impart knowledge about the following topics:

- Signals and systems & their mathematical representation.
- Discrete time systems.
- Transformation techniques & their computation.
- Filters and their design for digital implementation.
- Programmability digital signal processor & quantization effects.

**UNIT I INTRODUCTION 6+6**

Classification of systems: Continuous, discrete, linear, causal, stability, dynamic, recursive, time variance; classification of signals: continuous and discrete, energy and power; mathematical representation of signals; spectral density; sampling techniques, quantization, quantization error, Nyquist rate, aliasing effect.

**UNIT II DISCRETE TIME SYSTEM ANALYSIS 6+6**

Z-transform and its properties, inverse z-transforms; difference equation – Solution by z-transform, application to discrete systems - Stability analysis, frequency response – Convolution – Discrete Time Fourier transform , magnitude and phase representation.

**UNIT III DISCRETE FOURIER TRANSFORM & COMPUTATION 6+6**

Discrete Fourier Transform- properties, magnitude and phase representation - Computation of DFT using FFT algorithm – DIT &DIF using radix 2 FFT – Butterfly structure.

**UNIT IV DESIGN OF DIGITAL FILTERS 6+6**

FIR & IIR filter realization – Parallel & cascade forms. FIR design: Windowing Techniques – Need and choice of windows – Linear phase characteristics. Analog filter design – Butterworth and Chebyshev approximations; IIR Filters, digital design using impulse invariant and bilinear transformation Warping, pre warping.

**UNIT V DIGITAL SIGNAL PROCESSORS 6+6**

Introduction – Architecture – Features – Addressing Formats – Functional modes - Introduction to Commercial DS Processors.

**TOTAL : 60 PERIODS**

**OUTCOMES:**

1. Ability to understand the importance of Fourier transform, digital filters and DS Processors.
2. Ability to acquire knowledge on Signals and systems & their mathematical representation.
3. Ability to understand and analyze the discrete time systems.
4. Ability to analyze the transformation techniques & their computation.
5. Ability to understand the types of filters and their design for digital implementation.
6. Ability to acquire knowledge on programmability digital signal processor & quantization effects.



**TEXT BOOKS:**

1. J.G. Proakis and D.G. Manolakis, 'Digital Signal Processing Principles, Algorithms and Applications', Pearson Education, New Delhi, PHI. 2003.
2. S.K. Mitra, 'Digital Signal Processing – A Computer Based Approach', McGraw Hill Edu, 2013.
3. Lonnie C.Ludeman, "Fundamentals of Digital Signal Processing", Wiley, 2013

**REFERENCES**

1. Poorna Chandra S, Sasikala. B ,Digital Signal Processing, Vijay Nicole/TMH,2013.
2. Robert Schilling & Sandra L.Harris, Introduction to Digital Signal Processing using Matlab", Cengage Learning,2014.
3. B.P.Lathi, 'Principles of Signal Processing and Linear Systems', Oxford University Press, 2010 3. Taan S. ElAli, 'Discrete Systems and Digital Signal Processing with Mat Lab', CRC Press, 2009.
4. SenM.kuo, woonseng...s.gan, "Digital Signal Processors, Architecture, Implementations & Applications, Pearson,2013
5. DimitrisG.Manolakis, Vinay K. Ingle, applied Digital Signal Processing,Cambridge,2012



  
**Dr. J.SUNDARARAJAN,**  
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Principal  
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## SMART PLANT MONITORING WITH IOT



### A PROJECT REPORT

*Submitted by*

**POORNAKUMAR.V** (920819105010)  
**GURUPRASATH.A** (920819105003)  
**VIGNESH. M** (920819105016)

*In partial fulfillment for the award of the degree*

*of*

**BACHELOR OF ENGINEERING**

**IN**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**NPR COLLEGE OF ENGINEERING AND TECHNOLOGY, NATHAM**

**ANNA UNIVERSITY: CHENNAI 600 025**

**JUNE 2022**



**Dr. J.SUNDARARAJAN,**  
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Principal

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## BONAFIDE CERTIFICATE

Certified that this project report "SMART PLANT MONITORING WITH IOT" is the bonafide work of "POORNAKUMAR.V (920819105010), GURUPRASATH.A (920819105003), VIGNESH.M (920819105016) " who carried out the project work under my supervision.

  
SIGNATURE

Dr. P.KANIRAJAN, M.E.,Ph.D.

**HEAD OF THE DEPARTMENT**

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Dindigul – 624001.

  
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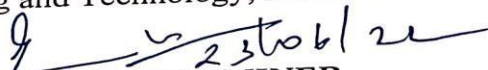
U.SARAYU M E.,  
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Submitted for the ANNA UNIVERSITY viva-voce Examination held  
on

23.06:22..... at NPR College of Engineering and Technology, Natham.

  
INTERNAL EXAMINER

  
EXTERNAL EXAMINER



  
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## ABSTRACT

As we can see in today's world only some devices like PC's and mobiles are connected to internet. Now-a-days world is fully overtaken by the internet and internet of things. Internet is use for basic need of all human beings. The Internet of Things (IOT) is the network of physical objects. It simply means to monitor a physical device or machine, or it is inter-networking of physical devices which is embedded with electronics, sensors, software and network connectivity to enable it to achieve greater value and services by exchanging data with the manufacturer. This project is designed as a plant monitoring system based on IOT. In this project we used different modules such as IOT, NodeMCU, Temperature sensor, Moisture sensor, Humidity sensor

India is agriculture sector, on either side, is losing ground every day, affecting the ecosystem's output capacity. In order to restore vitality and put agriculture back on a path of higher growth, there is a growing need to resolve the issue. A large-scale agricultural system necessitates a great deal of upkeep, knowledge, and oversight. The IoT is a network of interconnected devices that can transmit and receive data over the internet and carry out tasks without human involvement. Agriculture provides a wealth of data analysis parameters, resulting in increased crop yields. The use of IoT devices in.



  
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## CHAPTER 5

### CONCLUSION

A system to monitor temperature, humidity, moisture levels in the soil was designed and the project provides an opportunity to study the existing systems, along with their features and drawbacks. Agriculture is one of the most waterconsuming activities. The proposed system can be used to switch the motor (on/off) depending on favorable condition of plants i.e., sensor values, thereby automating the process of irrigation. which is one of the most time efficient activities in farming, which helps to prevent over irrigation or under irrigation of soil thereby avoiding crop damage. The farm owner can monitor the process online through Front End Structure. By this work, the wastage of water and the consumption of power by motor can be reduced so that they are conserved for the future use. Through this project it can be concluded that there can be considerable development in farming with the use of IOT and automation..



  
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**OBJECTIVES:**

To impart knowledge on the following Topics

- Awareness about renewable Energy Sources and technologies.
- Adequate inputs on a variety of issues in harnessing renewable Energy.
- Recognize current and possible future role of renewable energy sources.

**UNIT I RENEWABLE ENERGY (RE) SOURCES 9**

Environmental consequences of fossil fuel use, Importance of renewable sources of energy, Sustainable Design and development, Types of RE sources, Limitations of RE sources, Present Indian and international energy scenario of conventional and RE sources.

**UNIT II WIND ENERGY 9**

Power in the Wind – Types of Wind Power Plants(WPPs)–Components of WPPs-Working of WPPs- Siting of WPPs-Grid integration issues of WPPs.

**UNIT III SOLAR PV AND THERMAL SYSTEMS 9**

Solar Radiation, Radiation Measurement, Solar Thermal Power Plant, Central Receiver Power Plants, Solar Ponds.- Thermal Energy storage system with PCM- Solar Photovoltaic systems : Basic Principle of SPV conversion – Types of PV Systems- Types of Solar Cells, Photovoltaic cell concepts: Cell, module, array ,PV Module I-V Characteristics, Efficiency & Quality of the Cell, series and parallel connections, maximum power point tracking, Applications.

**UNIT IV BIOMASS ENERGY 9**

Introduction-Bio mass resources –Energy from Bio mass: conversion processes-Biomass Cogeneration-Environmental Benefits. Geothermal Energy: Basics, Direct Use, Geothermal Electricity. Mini/micro hydro power: Classification of hydropower schemes, Classification of water turbine, Turbine theory, Essential components of hydroelectric system.

**UNIT V OTHER ENERGY SOURCES 9**

Tidal Energy: Energy from the tides, Barrage and Non Barrage Tidal power systems. Wave Energy: Energy from waves, wave power devices. Ocean Thermal Energy Conversion (OTEC)- Hydrogen Production and Storage- Fuel cell : Principle of working- various types - construction and applications. Energy Storage System- Hybrid Energy Systems.

**TOTAL : 45 PERIODS**



### OUTCOMES:

- Ability to create awareness about renewable Energy Sources and technologies.
- Ability to get adequate inputs on a variety of issues in harnessing renewable Energy.
- Ability to recognize current and possible future role of renewable energy sources.
- Ability to explain the various renewable energy resources and technologies and their applications.
- Ability to understand basics about biomass energy.
- Ability to acquire knowledge about solar energy.

### TEXT BOOKS:

1. Joshua Earnest, Tore Wizeliu, 'Wind Power Plants and Project Development', PHI Learning Pvt.Ltd, New Delhi, 2011.
2. D.P.Kothari, K.C Singal, Rakesh Ranjan "Renewable Energy Sources and Emerging Technologies", PHI Learning Pvt.Ltd, New Delhi, 2013.
3. Scott Grinnell, "Renewable Energy & Sustainable Design", CENGAGE Learning, USA, 2016.

### REFERENCES

1. A.K.Mukerjee and Nivedita Thakur," Photovoltaic Systems: Analysis and Design", PHI Learning Private Limited, New Delhi, 2011
2. Richard A. Dunlap," Sustainable Energy" Cengage Learning India Private Limited, Delhi, 2015.
3. Chetan Singh Solanki, " Solar Photovoltaics : Fundamentals, Technologies and Applications", PHI Learning Private Limited, New Delhi, 2011
4. Bradley A. Striebig,Adebayo A.Ogundipe and Maria Papadakis," Engineering Applications in Sustainable Design and Development", Cengage Learning India Private Limited, Delhi, 2016.
5. Godfrey Boyle, "Renewable energy", Open University, Oxford University Press in association with the Open University, 2004.
6. Shobh Nath Singh, 'Non-conventional Energy resources' Pearson Education ,2015.



  
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**POWER GENERATION USING  
PIEZOELECTRIC MATERIAL**



**A PROJECT REPORT**

*Submitted by*

|                        |                       |
|------------------------|-----------------------|
| <b>AHAMED AFZAR .A</b> | <b>(920819105001)</b> |
| <b>SUJEETHARAN.S</b>   | <b>(920819105014)</b> |
| <b>PRADAP KANNAN.B</b> | <b>(920819105011)</b> |

*In partial fulfillment for the award of the degree*

*of*

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**BONAFIDE CERTIFICATE**

Certified that this project report “POWER GENERATION USING PEIZOELECTRIC MATERIAL” is the bonafide work of “

AHAMED AFZAR .A (920819105001), SUJEETHARAN.S (920819105014) and PRADAP KANNAN.B

(920819105011)” who carried out the project work under my supervision.

  
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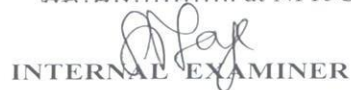
Mrs S.T.SARANYA,M.E.,

**SUPERVISOR**

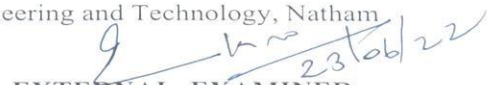
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INTERNAL EXAMINER

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ii



  
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## ABSTRACT

In present condition the shortage of electricity is the big problem for industrial growth as well as rural developing. Shortage of electricity has its effects on India's developing growth. To solve such types of problem we need to develop strong electricity generating techniques with the help of wasting human energy for our better future.

In this project we are generating electrical power as non-conventional method by simply walking or running on the foot step. Non-conventional energy system is very essential at this time to our nation. Nonconventional energy using foot step is converting mechanical energy into the electrical energy. Due to this a lot of energy resources have been exhausted and wasted. Proposal for the utilization of waste energy foot power with human locomotion is very much relevant and important for highly populated countries like India and china where the Roads, Railway stations, Bus stands, Temple, etc., are all over crowded and millions of people move around the clock.



  
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## CHAPTER – 8

### CONCLUSION:

The project is successfully tested which is the best economical, affordable energy solution to common people. This can be used for many applications in city areas where want more power. Bangladesh is a developing country where energy management is a big challenge for huge population. By using this project I can drive D.C loads according to the force I applied on the piezoelectric sensor. Although the theory developed in this report justifies the use of switching techniques in efficiently converting that energy to a usable form, there are obviously some practical limitations to the systems presented. The final prototype design does fulfill the objective of generating electricity from piezoelectric disk. Due to the low cost design of the piezoelectric system it is a practical product which could increase the operating period of most common products.



  
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**OBJECTIVES:****The student should be made to:**

- Understand the structure of basic electronic devices.
- Be exposed to active and passive circuit elements.
- Familiarize the operation and applications of transistor like BJT and FET.
- Explore the characteristics of amplifier gain and frequency response.
- Learn the required functionality of positive and negative feedback systems.

**UNIT I PN JUNCTION DEVICES 9**

PN junction diode –structure, operation and V-I characteristics, diffusion and transition capacitance - Rectifiers – Half Wave and Full Wave Rectifier,– Display devices- LED, Laser diodes, Zener diode characteristics- Zener Reverse characteristics – Zener as regulator

**UNIT II TRANSISTORS AND THYRISTORS 9**

BJT, JFET, MOSFET- structure, operation, characteristics and Biasing UJT, Thyristors and IGBT - Structure and characteristics.

**UNIT III AMPLIFIERS 9**

BJT small signal model – Analysis of CE, CB, CC amplifiers- Gain and frequency response –MOSFET small signal model– Analysis of CS and Source follower – Gain and frequency response- High frequency analysis.

**UNIT IV MULTISTAGE AMPLIFIERS AND DIFFERENTIAL AMPLIFIER 9**

BIMOS cascade amplifier, Differential amplifier – Common mode and Difference mode analysis – FET input stages – Single tuned amplifiers – Gain and frequency response – Neutralization methods, power amplifiers –Types (Qualitative analysis).

**UNIT V FEEDBACK AMPLIFIERS AND OSCILLATORS 9**

Advantages of negative feedback – voltage / current, series , Shunt feedback –positive feedback – Condition for oscillations, phase shift – Wien bridge, Hartley, Colpitts and Crystal oscillators.

**TOTAL : 45 PERIODS****OUTCOMES:****Upon Completion of the course, the students will be able to:**

- Explain the structure and working operation of basic electronic devices.
- Able to identify and differentiate both active and passive elements
- Analyze the characteristics of different electronic devices such as diodes and transistors
- Choose and adapt the required components to construct an amplifier circuit.
- Employ the acquired knowledge in design and analysis of oscillators

**TEXT BOOKS:**

1. . David A. Bell ,”Electronic devices and circuits”, Oxford University higher education, 5<sup>th</sup> edition 2008.
2. Sedra and smith, “Microelectronic circuits”,7<sup>th</sup> Ed., Oxford University Press



## REFERENCES:

1. Balbir Kumar, Shail.B.Jain, "Electronic devices and circuits" PHI learning private limited, 2<sup>nd</sup> edition 2014.
2. Thomas L.Floyd, "Electronic devices" Conventional current version, Pearson prentice hall, 10<sup>th</sup> Edition, 2017.
3. Donald A Neamen, "Electronic Circuit Analysis and Design" Tata McGraw Hill, 3rd Edition, 2003.
4. Robert L.Boylestad, "Electronic devices and circuit theory", 2002.
5. Robert B. Northrop, "Analysis and Application of Analog Electronic Circuits to Biomedical Instrumentation", CRC Press, 2004.



  
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**SMART ROAD SAFETY AND VEHICLE ACCIDENT  
AVOIDANCE SYSTEM FOR HILL ROADS**



**A PROJECT REPORT**

*Submitted by*

|                       |                       |
|-----------------------|-----------------------|
| <b>KARTHIKEYAN.R</b>  | <b>(920819105004)</b> |
| <b>RAJA MURUGAN.M</b> | <b>(920819105012)</b> |
| <b>PITCHIYATHA.D</b>  | <b>(920819105009)</b> |

*In partial fulfillment for the award of the degree*

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**ANNA UNIVERSITY: CHENNAI 600 025**

**JUNE 2022**



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**BONAFIDE CERTIFICATE**

Certified that this project report "SMART ROAD SAFETY AND VEHICLE ACCIDENT AVOIDANCE SYSTEM FOR HILL ROADS" is the bonafide work of "KARTHIKEYAN .R (920819105004), RAJA MURUGAN .M (90819105012) and PITCHAYATHA .D (920819105009)" who carried out the project work under my supervision.

  
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INTERNAL EXAMINER

  
EXTERNAL EXAMINER



  
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## ABSTRACT

Within the Developing countries accident is that the main reason for death. If we watch top 10 countries within the globe all of them are mountain road and curve roads. Within the mountain there'll be tight curves and narrow roads due to this visibility is blocked. In these reasonably situation the motive force of vehicle cannot see vehicle coming from opposite side. The developing countries need to adopt the model followed by developing countries like Netherland & Denmark where roads are built in line with their function, in developing countries buses and trucks are more involved in accidents because of lack of proper safety standards. Thousands of individuals lost their lives due to this problem. Utilization of day time light, high mounted stop lamps, reflectors, colorful clothing has decreased the incidence of crashes due to poor visibility. The answer of this problem is alerting the motive force about the vehicle coming from opposite side. This is often done by keeping the ultrasonic sensor in one side of the road before the curve and keeping a LED light after the curve, so that vehicle comes from one side of curve senses and LED light glow at opposite side. By viewing the LED light on/off criteria the motive force can become alert and may hamper the speed of vehicle.



iii



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## CHAPTER 5

### CONCLUSION

In the present globe the proportion of accident has increased so widely because people weren't helping when accident occurs even person is fallen before of their eyes .So our main motive of this project is to avoid the accident by implementing sensor based technology and in future if accident of person is happened he wouldn't need to depend upon others he can safely travel or can pass curves or hilly roads when LED light glows it gives in indications of alert .The purpose of this paper is to decrease the quantity of accidents in curve roads. This can be done by alerting the driver by means of LED light which glows when vehicle comes from the opposite side of the curve. The vehicle is detected by the assistance of Ultrasonic sensor which is interfaced to the microcontroller arduino UNO. By this we can save thousands of lives within the curve roads.



  
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**COURSE OBJECTIVES:**

- To make the students to understand the basics of dielectric materials and insulation.
- To understand the electrical properties of materials including free electron theory, applications of quantum mechanics and magnetic materials.
- To instil knowledge on physics of semiconductors, determination of charge carriers and device applications
- To establish a sound grasp of knowledge on different optical properties of materials, optical displays and applications
- To inculcate an idea of significance of nano structures, quantum confinement and ensuing nano device applications.

**UNIT I DIELECTRIC MATERIALS AND INSULATION 9**

Matter polarization and relative permittivity: definition – dipole moment and polarization vector P- polarization mechanisms: electronic, ionic, orientational, interfacial and total polarization – frequency dependence – local field and Clausius-Mossetti equation – dielectric constant and dielectric loss – Gauss's law and boundary conditions – dielectric strength, introduction to insulation breakdown in gases, liquids and solids – capacitor materials – typical capacitor constructions – piezoelectricity, ferroelectricity and pyroelectricity – quartz oscillators and filters – piezo and pyroelectric crystals.

**UNIT II ELECTRICAL AND MAGNETIC PROPERTIES OF MATERIALS 9**

Classical free electron theory - Expression for electrical conductivity – Thermal conductivity, expression - Quantum free electron theory: Tunneling – degenerate states – Fermi- Dirac statistics – Density of energy states – Electron in periodic potential – Energy bands in solids – tight binding approximation - Electron effective mass – concept of hole. Magnetic materials: Dia, para and ferromagnetic effects – paramagnetism in the conduction electrons in metals – exchange interaction and ferromagnetism – quantum interference devices – GMR devices.

**UNIT III SEMICONDUCTORS AND TRANSPORT PHYSICS 9**

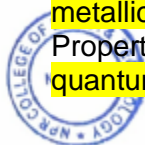
Intrinsic Semiconductors – Energy band diagram – direct and indirect band gap semiconductors – Carrier concentration in intrinsic semiconductors – extrinsic semiconductors - Carrier concentration in N-type & P-type semiconductors – Variation of carrier concentration with temperature – Carrier transport in Semiconductors: Drift, mobility and diffusion – Hall effect and devices – Ohmic contacts – Schottky diode.

**UNIT IV OPTICAL PROPERTIES OF MATERIALS 9**

Classification of optical materials – Optical processes in semiconductors: optical absorption and emission, charge injection and recombination, optical absorption, loss and gain. Optical processes in quantum wells – Optoelectronic devices: light detectors and solar cells – light emitting diode – laser diode - optical processes in organic semiconductor devices –excitonic state – Electro-optics and nonlinear optics: Modulators and switching devices – plasmonics.

**UNIT V NANO DEVICES 9**

Density of states for solids - Significance between Fermi energy and volume of the material – Quantum confinement – Quantum structures – Density of states for quantum wells, wires and dots – Band gap of nanomaterials –Tunneling – Single electron phenomena – Single electron Transistor. Conductivity of metallic nanowires – Ballistic transport – Quantum resistance and conductance – Carbon nanotubes: Properties and applications - Spintronic devices and applications – Optics in quantum structures – quantum well laser.

**TOTAL: 45 PERIODS**



## OUTCOMES:

At the end of the course, the students should be able to

**CO1:** know basics of dielectric materials and insulation.

**CO2:** gain knowledge on the electrical and magnetic properties of materials and their applications

**CO3:** understand clearly of semiconductor physics and functioning of semiconductor devices

**CO4:** understand the optical properties of materials and working principles of various optical devices

**CO5:** appreciate the importance of nanotechnology and nanodevices.

## TEXT BOOKS:

1. S.O. Kasap. Principles of Electronic Materials and Devices, McGraw Hill Education (Indian Edition), 2020.
2. R.F.Pierret. Semiconductor Device Fundamentals. Pearson (Indian Edition), 2006.
3. G.W.Hanson. Fundamentals of Nanoelectronics. Pearson Education (Indian Edition), 2009.

## REFERENCES:

1. Laszlo Solymar, Walsh, Donald, Syms and Richard R.A., Electrical Properties of Materials, Oxford Univ. Press (Indian Edition) 2015.
2. Jasprit Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw-Hill Education (Indian Edition), 2019.
3. Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019.
4. Mark Fox, Optical Properties of Solids, Oxford Univ.Press, 2001.
5. Parag K. Lala, Quantum Computing: A Beginner's Introduction, McGraw-Hill Education (Indian Edition), 2020.



  
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An ISO 9001:2015 Certified Institution.

Phone No: 04544- 246 500, 246501, 246502.

Website : [www.nprcolleges.org](http://www.nprcolleges.org), [www.nprcet.org](http://www.nprcet.org), Email [nprcetprincipal@nprcolleges.org](mailto:nprcetprincipal@nprcolleges.org)



## PERMISSION LETTER

From

Dr. T. Priya,  
Head of the Department,  
Department of Science and Humanities,  
NPR College of Engineering & Technology,  
Natham,  
Dindigul – 624 401.

To

The Administrative Office,  
NPR Group of Institutions,  
Natham,  
Dindigul – 624 401.

Through Proper Channel

Sir,

Sub: Requesting permission for Industrial visit – Reg.

This is to bring to your kind notice that we are planning to organize one day visit to **VEI Technologies** for the 1<sup>st</sup> Year students.

So, I request you to grant permission for 80 students from I Year (60 Boys & 20 Girls) and 2 staff members (Mr. P. Madasamy, AP/ Maths and Mrs.S.Visithra, AP/ Maths) on 18.12.2021 to visit **VEI Technologies, Chennai**.

Kindly do the needful.

Thanking you,

Yours faithfully,

  
**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
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(Dr. T. Priya)





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## REQUISITION LETTER

Gmail

Inbox

NPR S&H<hodmathematicsnprcet@gmail.com>

To: [info@veitechnologies.com](mailto:info@veitechnologies.com)

Mon, DEC 13, 2021,  
10.16 AM

Respected Sir,

Greetings...!

Our NPR College of engineering and technology is situated in Natham, Dindigul district in a lush green environment established with the objective of ensuring the personal and professional development of the students from rural backgrounds offering UG and PG courses.

It has been a regular practice in our Science and Humanities Department to arrange industrial visits for our students every semester to reputed engineering industries. Based on that, 40 1 YEAR students and 2 staff members of our Science and Humanities department have planned to visit **VEI Technologies**. We assure you sir, our students will follow the safety rules and will not disturb your regular processes. We humbly request you to grant us permission for the same and to confirm the permission through letter or mail.

Thanks, and regards

Dr. T. Priya,

Professor & Head

Department of Science and Humanities,

NPRCET,

Natham.



Reply Forward





# NPR College of Engineering & Technology

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An ISO 9001:2015 Certified Institution.

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Website : [www.nprcolleges.org](http://www.nprcolleges.org), [www.nprcet.org](http://www.nprcet.org), Email [nprcetprincipal@nprcolleges.org](mailto:nprcetprincipal@nprcolleges.org)



## CONFIRMATION LETTER FROM INDUSTRY

NPR S&H<[hodmathematicsnprcet@gmail.com](mailto:hodmathematicsnprcet@gmail.com)>

Mon, DEC 13, 2021,

To: [info@veitechnologies.com](mailto:info@veitechnologies.com)

10.16 AM

Respected Sir,

Greetings...!

Our NPR College of engineering and technology is situated in Natham, Dindigul district in a lush green environment established with the objective of ensuring the personal and professional development of the students from rural backgrounds offering UG and PG courses.

It has been a regular practice in our Science and Humanities Department to arrange industrial visits for our students every semester to reputed engineering industries. Based on that, 40 I YEAR students and 2 staff members of our Science and Humanities department have planned to visit VEI **Technologies**. We assure you sir, our students will follow the safety rules and will not disturb your regular processes. We humbly request you to grant us permission for the same and to confirm the permission through letter or mail.

Thanks, and regards

Dr. T. Priya,

Prof & HOD,

Department of Science and Humanities,

NPRCET,

Natham.



Reply Forward

Gmail

Inbox

[info@veitechnologies.com](mailto:info@veitechnologies.com)

Wed, Dec 15, 2021, 12.28 PM

To: [hodmathematicsnprcet@gmail.com](mailto:hodmathematicsnprcet@gmail.com)

Dear Madam,

We are happy to give permission for the industrial visit to your wards in VEI Technologies, Chennai. Kindly remind us one day in advance for the visit schedule also send the original letter copy with your hand during the visit.

Thanks and Regards,

Dr B Ezhilavan,

Managing Director,

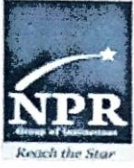
VEI Technologies, Chennai.



**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal

N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.





# NPR College of Engineering & Technology

NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

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## Industrial Visit to VEI Technologies, Chennai

### DEPARTMENT OF SCIENCE AND HUMANITIES

#### STUDENTS LIST

PLACE OF INDUSTRIAL VISIT: VEI Technologies, Chennai

DATE: 18.12.2021

| S. NO | NAME OF THE STUDENT | DEPARTMENT | GENDER | SIGNATURE          |
|-------|---------------------|------------|--------|--------------------|
| 1.    | JEEVADHARANI P      | EEE        | FEMALE | Jeevadharani P     |
| 2.    | LOGESH KUMAR B      | EEE        | MALE   | Logesh Kumar B     |
| 3.    | LOGESHWARAN S       | EEE        | MALE   | Logeshwaran S      |
| 4.    | MOHAMED THOUFEEK    | EEE        | MALE   | Mohamed Thoufeek   |
| 5.    | RAMYA M             | EEE        | FEMALE | Ramyam             |
| 6.    | SANTHOSH A          | EEE        | MALE   | Santhosh A         |
| 7.    | SANTHOSH KUMAR R    | EEE        | MALE   | Santhosh Kumar R   |
| 8.    | JEYAVARTYIHINI      | EEE        | FEMALE | Jeyavartiyhini     |
| 9.    | KEERTHIKA P         | EEE        | FEMALE | Keerthika P        |
| 10.   | LAARADOLLY S        | EEE        | FEMALE | Laaradolly S       |
| 11.   | KIRTHIKANANTH M     | CSE        | MALE   | Kirthikananth M    |
| 12.   | MOHAMMED ABDULA S   | CSE        | MALE   | Mohammed Abdula S  |
| 13.   | MUTHUARIVU K        | CSE        | MALE   | Muthuarivu K       |
| 14.   | PRAVEEN C           | CSE        | MALE   | Praveen C          |
| 15.   | RAGHUL S P          | CSE        | MALE   | Raghul S P         |
| 16.   | AARIF H             | CSE        | MALE   | Aarif H            |
| 17.   | AJAY KUMAR K        | CSE        | MALE   | Ajay Kumar K       |
| 18.   | ANBARASAN P         | CSE        | MALE   | Anbarasan P        |
| 19.   | ANBARASU S          | CSE        | MALE   | Anbarasu S         |
| 20.   | ANBULINGAM E        | CSE        | MALE   | Anbulingam E       |
| 21.   | APSARA JASMINE S    | CSE        | FEMALE | Apsara Jasmine S   |
| 22.   | ARASUTHANGAPANDI M  | CSE        | MALE   | Arasuthangapandi M |
| 23.   | ARUSHA BANU A       | CSE        | FEMALE | Arusha Banu A      |
| 24.   | BABY SHALINI C      | CSE        | FEMALE | Baby Shalini C     |
| 25.   | DHARANI T           | CSE        | FEMALE | Dharani T          |
| 26.   | SUSMITHA N          | CSE        | FEMALE | Susmitha N         |
| 27.   | THESHAN BANU S      | CSE        | FEMALE | Theshan Banu S     |
| 28.   | DHARANI R           | ECE-A      | FEMALE | Dharani R          |
| 29.   | DHARSHINI B         | ECE-A      | FEMALE | Dharshini B        |
| 30.   | DIVYA DHARSINI G    | ECE-A      | FEMALE | Divya Dharsini G   |
| 31.   | DURGA S             | ECE-A      | FEMALE | Durga S            |
| 32.   | GANESAN M           | ECE-A      | MALE   | Ganesan M          |
| 33.   | GOPINATH S          | ECE-A      | MALE   | Gopinath S         |
| 34.   | HARESHKUMAR K       | ECE-A      | MALE   | Hareshkumar K      |
| 35.   | HARIHARAN R         | ECE-A      | MALE   | Hariharaan R       |
| 36.   | MOHAMED IMTHIYAS K  | ECE-A      | MALE   | Mohamed Imthiyas K |





|     |                       |       |        |  |
|-----|-----------------------|-------|--------|--|
| 37. | MOHAMMED HISSAM R     | ECE-A | MALE   |  |
| 38. | MOKESH NANDHU P       | ECE-A | MALE   |  |
| 39. | MUKESH VARMA M        | ECE-A | MALE   |  |
| 40. | NACHAMMAI C           | ECE-A | FEMALE |  |
| 41. | AAKASH R              | ECE-A | MALE   |  |
| 42. | ABDUL RAHMAN A        | ECE-A | MALE   |  |
| 43. | ABHISHEK S            | ECE-A | MALE   |  |
| 44. | ALAGU PANDI P         | ECE-A | MALE   |  |
| 45. | ASHOK KUMAR S         | ECE-A | MALE   |  |
| 46. | BALURATHINAM B T      | ECE-A | MALE   |  |
| 47. | BHUWANESHWARAN B      | ECE-A | MALE   |  |
| 48. | CHINRAMAN V           | ECE-A | MALE   |  |
| 49. | DHANANJEYAN M         | ECE-A | MALE   |  |
| 50. | HARISHBALAJI E        | ECE-A | MALE   |  |
| 51. | HEMANTH BALA M        | ECE-A | MALE   |  |
| 52. | IMRANA Y              | ECE-A | MALE   |  |
| 53. | JOSEPH SAMUEL M       | ECE-A | MALE   |  |
| 54. | KALEESHWARAN M        | ECE-A | MALE   |  |
| 55. | KARTHICK B            | ECE-A | MALE   |  |
| 56. | LAKSHMANADHASAN S     | ECE-A | MALE   |  |
| 57. | LAKSHMANAN K          | ECE-A | MALE   |  |
| 58. | MANIKANDAN G          | ECE-A | MALE   |  |
| 59. | MANIKANDAN N          | ECE-A | MALE   |  |
| 60. | MANOJ KUMAR S         | ECE-A | MALE   |  |
| 61. | MELVIN MECVAAN J      | ECE-A | MALE   |  |
| 62. | MOHAMED BARUK S       | ECE-A | MALE   |  |
| 63. | SARANYA               | ECE-B | MALE   |  |
| 64. | PRIYA DHARSHINI S     | ECE-B | MALE   |  |
| 65. | SANGILI PERUMAL M     | ECE-B | MALE   |  |
| 66. | SIVA BALAN S          | ECE-B | MALE   |  |
| 67. | SIVABALAJI M          | ECE-B | MALE   |  |
| 68. | SUBASH CHANDRA BOSE S | ECE-B | MALE   |  |
| 69. | NEHA A                | ECE-B | FEMALE |  |
| 70. | NITHISHKUMAR K        | ECE-B | MALE   |  |
| 71. | NITHYASRI R           | ECE-B | FEMALE |  |
| 72. | PARTHA SARATHI K      | ECE-B | MALE   |  |
| 73. | NADHIYA M             | ECE-B | FEMALE |  |
| 74. | TAMILARASI C          | ECE-B | FEMALE |  |
| 75. | RAGUL M               | ECE-B | MALE   |  |
| 76. | RAMAPRABAKARAN R      | ECE-B | MALE   |  |
| 77. | RAMJI M               | ECE-B | MALE   |  |
| 78. | RAVIKUMAR S           | ECE-B | MALE   |  |
| 79. | SABARI PRASATH P      | ECE-B | MALE   |  |
| 80. | SAKTHI PRASANNA M     | ECE-B | MALE   |  |

HOD-I YEAR  
(Con. Pita)

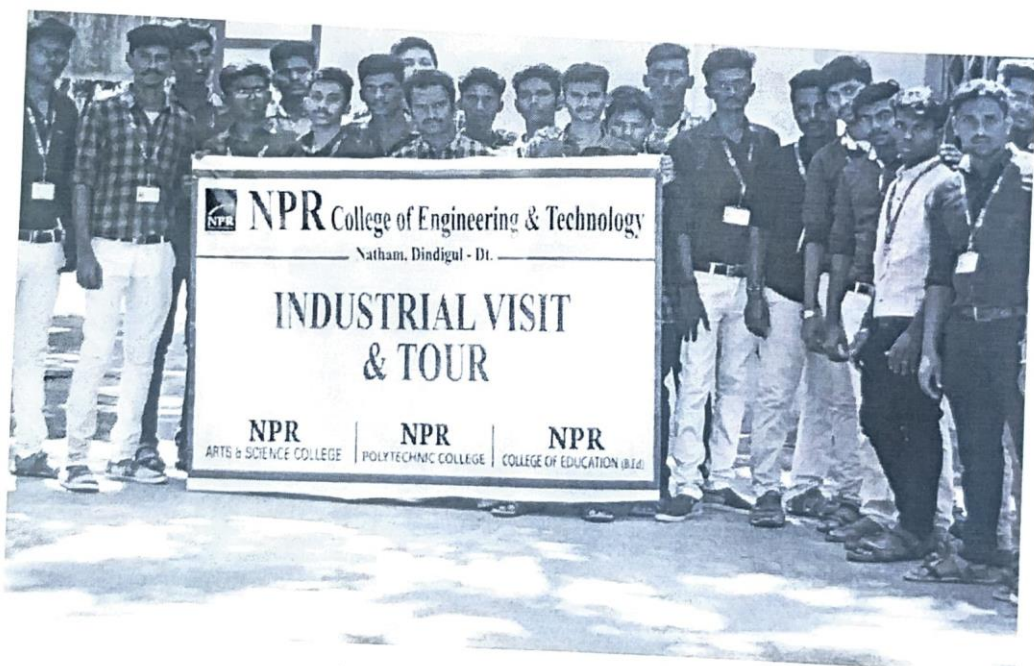


PRINCIPAL  
**Dr. JSUNDARARAJAN,**  
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|  |  |   |
|--|--|---|
|  <p><b>NPR</b><br/>Group of Institutions<br/>Reach the Star</p> | <h1 style="text-align: center;">NPR College of Engineering &amp; Technology</h1> <p style="text-align: center;">NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.<br/>Approved by AICTE, New Delhi &amp; Affiliated to Anna University, Chennai.<br/>An ISO 9001:2015 Certified Institution.<br/>Phone No: 04544- 246 500, 246501, 246502.<br/>Website : <a href="http://www.nprcolleges.org">www.nprcolleges.org</a>, <a href="http://www.nprcet.org">www.nprcet.org</a>, Email <a href="mailto:nprcetprincipal@nprcolleges.org">nprcetprincipal@nprcolleges.org</a></p> |  |
|--|--|---|

## Industrial Visit to VEI Technologies, Chennai

### PHOTO GALLERY



Students are standing in front of VEI Technologies



  
**Dr. J.SUNDARARAJAN,**  
 B.E., M.Tech, Ph.D.,  
 Principal  
 N.P.R. College of Engineering & Technology  
 Natham, Dindigul (Dt) - 624 401.



|   |  |   |
|---|--|---|
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|---|--|---|

### Industrial Visit to VEI Technologies, Chennai

#### SUMMARY REPORT

The purpose of the visit was to provide the students with an opportunity to gain practical knowledge about the functioning of an industry and its various departments. The visit was attended by a I year Students from NPR CET and took place on December.18<sup>th</sup>.2021. We were picked up from NPR CET at 9:30 pm and travelled by bus to Chennai. We reached Chennai at 6:00 am and returned to NPR CET at 5:00 am the next day.

VEI Technologies, is R&D company with proficient web development and software solution company based in Chennai. They offer an extensive range of services to reach our targeted spectators and carve up our valuable information focusing on retaining their customers.

From 9:00 am to 12:00 pm, the students visited VEI Technologies and were given a guided tour of the facility. They were able to see the various departments in action and understand the working of the industry.


We met the Director of the company, Mr. Babu Ezhilavan, Poonamallee, Chennai, where the company staff explained about some of their services, Web application development, Website designing, corporate profiles and presentations, E-commerce solutions, Application development, maintenance, and re-engineering, Mail gateways, Web hosting solutions, Search Engine Optimization, and Flash development.

They interacted with students very well and gave us an insight about the value added courses they provide on IOT, Java and Python. Students are also asked some questions regarding the courses to them and cleared their doubts.

From 12:00 pm to 1:00 pm, the students had their lunch at a nearby restaurant. From 1:00 pm to 3:00 pm, the students visited the planetarium, followed by a visit to the zoo from 3:00 pm to 5:00 pm, and then a visit to the beach from 5:00 pm to 6:30 pm. The students started to return at 8:00 pm and reached NPRCET at 5:00 am the next day.

Overall, the industrial visit to VEI Technologies in Chennai was a valuable experience for the students to understand the practical aspects of an industry and its functioning. The visit was well-organized and provided a good balance between the industrial visit and leisure activities.

1. S. Visithug.  
2. P. Madasamy  
Faculty Co-ordinators

  
HOD-I Year  
(Dr. P. Raja)



  
IQAC

Coordinator - IQAC  
NPR College of Engineering & Technology,  
Natham, Dindigul (Dt)-624

  
Principal  
**Dr. J. SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
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NPR College of Engineering & Technology