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CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

# FEEDBACK ANALYSIS REPORT OF STAKEHOLDERS (2022-23)

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CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
Chandubhai S Patel Institute of Technology
M & V Patel Department of Electrical Engineering

## CURRICULUM FEEDBACK ANALYSIS (Students)

Academic Year: 2022-23

Date: 30/06/2023

| Sr. No. | Aspect | Great (A) | Good (B) | Satisfactory (C) | Poor (D) | Very Poor (E) | Average | Response |
|---|---|---|---|---|---|---|---|---|
| 1 | Matching with vision-mission statement | 11 | 13 | 6 | 0 | 0 | 4.16 | 83.33 |
| 2 | Development of Social Understanding | 18 | 8 | 3 | 1 | 0 | 4.43 | 88.66 |
| 3 | Promotion of Maximum Personal Development | 14 | 10 | 6 | 0 | 0 | 4.26 | 85.33 |
| 4 | Promotion of Continuity of Experience | 17 | 11 | 2 | 0 | 0 | 4.50 | 90.00 |
| 5 | Utilization of Effective Learning Experiences and Needed Resources | 16 | 9 | 5 | 0 | 0 | 4.36 | 87.33 |

Scale — Great: 5, Good: 4, Satisfactory: 3, Poor: 2, Very Poor: 1

Total No. of Responses: 30

Average (A*5 + B*4 + C*3 +D*2 + E*1)/Total no. of responses,

% Response = (Average*100)/5

Other Comments/Suggestions:

1. Overall positive feedback from students.
2. Increase number of practical sessions.
3. Beneficial for carrier oriented skills.
4. Satisfied with department efforts.

HEAD OF DEPARTMENT
Dept. of Electrical Engg.
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At. & Po. Changa-388421., Ta. Petlad,
Dist. : Anand. (Gujarat)

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## CURRICULUM FEEDBACK ANALYSIS (Alumni)

Academic Year: 2022-23

Date: 30/06/2023

| Sr. No. | Aspect | Excellent (A) | Very Good (B) | Good (C) | Satisfac-tory (D) | Need Improvement (E) | Average | Response |
|---|---|---|---|---|---|---|---|---|
| 1 | The curriculum was: | 9 | 3 | 0 | 0 | 0 | 4.75 | 95.00 |
| 2 | The relevance of the curriculum of your degree with respect to your current job/position is: | 6 | 5 | 1 | 0 | 0 | 4.42 | 88.33 |
| 3 | When you meet students, who have taken a similar Program at other universities, you feel that your Program is: | 9 | 3 | 0 | 0 | 0 | 4.75 | 95.00 |
| 4 | Have you participated in any of the extracurricular activities of the Department /University? | 4 (Very Often) | 4 (Often) | 2 (Some-times) | 2 (Rarely) | 0 (Never) | 3.83 | 76.66 |
| 5.1 | Learning value (in terms of skills, concepts, knowledge, analytical abilities, or broadening perspectives) | 10 | 2 | 0 | 0 | 0 | 4.47 | 89.41 |
| 5.2 | Applicability/relevance to real life situations | 6 | 5 | 1 | 0 | 0 | 4.42 | 88.33 |
| 5.3 | Extent and depth of content | 9 | 3 | 0 | 0 | 0 | 4.75 | 95.00 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5.4 | Extent of coverage | 10 | 0 | 0 | 0 | 0 | 4.83 | 96.66 |
| 5.5 | Relevance/learning value of project/ training | 6 | 5 | 1 | 0 | 0 | 4.41 | 88.33 |

Scale — Excellent: 5, Very Good: 4, Good: 3, Satisfactory: 2, Need Improvement: 1

Total No. of Responses: 12

Average = (A*5 + B*4 + C*3 +D*2 + E*1)/Total no. of responses

% Response = (Average*100)/5

Other Comments/Suggestions:

1. Give more hands-on experience with industry projects.
2. Include basic finance-related course
3. Include a course on machine learning
4. Strengthen summer internship.

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## CURRICULUM FEEDBACK ANALYSIS (Academic Peers/Teachers/Industry)

Academic Year: 2022-23

Date: 30/06/2023

| Sr. No. | Aspect | Excellent (A) | Very Good (B) | Good (C) | Satisfactory (D) | Needs Improvement (E) | Average | Response |
|---|---|---|---|---|---|---|---|---|
| I | Content of syllabus | 15 | 5 | 1 | 0 | 0 | 4.67 | 93.33 |
| 2 | Relevance of syllabus to industry/research requirements | 11 | 9 | 1 | 0 | 0 | 4.48 | 89.52 |
| 3 | Course outcomes are well defined | 15 | 5 | 1 | 0 | 0 | 4.67 | 93.33 |
| 4 | Sufficient reading materials and digital resources provided | 16 | 4 | 1 | 0 | 0 | 4.71 | 94.28 |
| 5 | Incorporation of advanced topics | 10 | 10 | 0 | 1 | 0 | 4.38 | 87.62 |
| 6 | Pedagogy proposed has a desired balance between theory and practical | 16 | 4 | 1 | 0 | 0 | 4.71 | 94.28 |
| 7 | Assessment methods are fair, measuring the outcomes | 14 | 7 | 0 | 0 | 0 | 4.67 | 93.33 |
| 8 | Project component in the course, (if applicable) | 13 | 6 | 1 | 1 | 0 | 4.48 | 89.52 |
| 9 | Industrial training/ practical exposure in the course, (if applicable) | 12 | 5 | 3 | 1 | 0 | 4.33 | 86.67 |

Scale — Excellent: 5, Very Good: 4, Good: 3, Satisfactory: 2, Need Improvement: 1

Total No. of Responses: 21

Average = (A*5 + B*4 + C*3 +D*2 + E*1)/Total no. of responses

% Response = (Average*100)/5

Other Comments/Suggestions:

1. High Voltage Engineering Should be a compulsory course.
2. A test on self-study material should be taken by students.
3. Add courses related to AI-ML and semiconductors and smart grid & EV, Autonomous cars, VLSI, Advanced Power Electronics etc.

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CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
Chandubhai S Patel Institute of Technology
M & V Patel Department of Electrical Engineering

## CURRICULUM FEEDBACK ANALYSIS (Employers)

Academic Year: 2022-23

Date: 30/06/2023

| Sr. No. | Aspect | Strongly Agree (A) | Agree (B) | Neutral (C) | Disagree (D) | Strongly Disagree (E) | Average | Response |
|---|---|---|---|---|---|---|---|---|
| I | Technical knowledge and skills of the graduate(s) are up to date. | 2 | 2 | 0 | 0 | 0 | 4.50 | 90 |
| 2 | Curriculum provides adequate knowledge and training to the students. | 2 | 2 | 0 | 0 | 0 | 4.50 | 90 |
| 3 | The graduate(s) exhibits problem solving, leadership & managerial skills. | 3 | 1 | 0 | 0 | 0 | 4.75 | 95 |
| 4 | The graduate(s) maintain good interpersonal relations with their colleagues and seniors. | 3 | 1 | 0 | 0 | 0 | 4.75 | 95 |
| 5 | The graduate(s) volunteer themselves for new initiatives. | 2 | 1 | 1 | 0 | 0 | 4.25 | 85 |
| 6 | The graduate(s) mould themselves as per need of organization. | 2 | 1 | 1 | 0 | 0 | 4.25 | 85 |
| 7 | Curriculum facilitated the graduate(s) to attain the desired competency level. | 4 | 0 | 0 | 0 | 0 | 5 | 100 |
| 8 | Curriculum enriched the moral values among the graduate(s). | 3 | 1 | 0 | 0 | 0 | 4.75 | 95 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 9 | The Teaching-learning process prepared them for team work. | 4 | 0 | 0 | 0 | 0 | 5 | 100 |
| 10 | Communication skills of students are good. | 1 | 3 | 0 | 0 | 0 | 4.25 | 85 |
| 11 | The graduate(s) display sensitivity towards colleagues of varied background and competency levels | 2 | 2 | 0 | 0 | 0 | 4.50 | 90 |

Scale — Excellent: 5, Very Good: 4, Good: 3, Satisfactory: 2, Need Improvement: 1

Total No. of Responses: 4

Average = (A*5 + B*4 + C*3 +D*2 + E*1)/Total no. of responses

% Response = (Average*100)/5

Other Comments/Suggestions:

1. Given appreciation for the establishment of the Cable and Wire Testing Lab.
2. Add contents on ADAS and micro-controlled application base EV

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# FEEDBACK ACTION TAKEN REPORT OF STAKEHOLDERS (2022-23)

Item 20.11 Annexure 8B

**Date: 01st July 2023**

**Subject**: Action Plan from various feedback received

**Reference Department**: EE Dept

**1. Action plan from Feedback received from employers.**

| # | Suggestion | Action Plan/Taken |
|---|---|---|
| 1 | EV technology course shall be in line with industry practices. | Content related to industrial practices in EV industry will be added in courses. |
| 2 | Microprocessor interfacing course to be added | Microprocessor and Interfacing course is added in curriculum in Third Year from AY2023-24. Annexure A, A.1, A.2 |

**2. Action plan from Feedback received from Teachers (End semester course feedback)**

| # | Suggestion | Action Plan/Taken |
|---|---|---|
| 1 | Course based on Smartgrid, autonomous car should beaded in curriculum | In minor specialization of "Electrical Vehicle System", the content has been added. Annexure B, B.1, B.2 |
| 2 | Few courses related to AI-ML must be added. | Courses related to AI-ML will be added from AY2024-25. |

### 3. Action plan from Feedback received from Alumni

| # | Suggestion | Action Plan |
|---|---|---|
| 1 | Introduce courses towards the renewable sector and in field of Machine Learning. | Two courses are already offered in curriculum. As per demand, new contents can be added in curriculum. Annexure C, C.1 |
| 2 | More hands on experience through industry reverent projects. | Full Final semester project has been added in curriculum. Students have to work on industry defined problems. Annexure D |

### 4. Action plan from Feedback received from final year students (from E-Governance)

| # | Suggestion | Action Plan |
|---|---|---|
| 1 | Use more hands-on learning | Along with the classroom teaching, lab based teaching/experimenting will be encouraged. |
| 2 | Organizing more Technical events | National level Technical events will be organize in February 2024. Annexure E |

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
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**MINUTES OF THE MEETING OF THE BOARD OF STUDIES IN ELECTRICAL ENGINEERING, FACULTY OF TECHNOLOGY AND ENGINEERING HELD ON 25th August 2023 (Friday) AT online platform Google Meet.**

The 20th meeting of Board of Studies, M&V Patel Department of Electrical Engineering, Faculty of Technology and Engineering (FTE), Charotar University of Science and Technology (CHARUSAT) was held on 25/08/2023 at 10.00 a.m. On an online platform. The following members were present:

Members Present

| Sl. No. | Name | Designation |
|---|---|---|
| 1. | Dr. Nilay Patel | **Chairman** |
| 2. | Dr. Mihir A. Bhatt | Member |
| 3. | Dr. Jigar Sarda | Member |
| 4. | Mr. Soaib Saiyad | Member |
| 5. | Mr. Jivanadhar Joshi | Member |
| 6. | Dr. Santosh Vora | External Member |
| 7. | Dr. V K Shah | External Member |
| 8. | Dr. Praghnesh Bhatt | External Member |
| 9. | Mr. Darshan Shulka | External Member |
| 10. | Mr. Dhaval Patel | Alumni Member |

Following Members were absent.

| Sl. No. | Name | Designation |
|---|---|---|
| 1. | Dr. Naran Pindoriya | External Member |
| 2. | Mr. Sanjay Mahagaokar | External Member |
| 3. | Dr. Satish H Chetwani, | External Member |

Initiation:
Dr. Nilay Patel welcomed all the members of Board of Studies.
The following resolutions were made in the BoS,

| | |
|---|---|
| | Agenda/Item No 20.01: For Confirmation: Minutes of the 19th Board of Studies meeting held on Thursday, 25th February 2023.<br>Proceeding & Resolution No 20.01: The 19th Meeting of the Board of Study was held on 25th February 2023. The minutes were circulated on 18th March 2023. As there were no comments received from any member, the Board of Study confirmed the minutes. |

| | |
|---|---|
| | Agenda No.20.02: For approval: Action taken on the agenda items of the 18th Board of Study Meeting.<br>Proceeding No.20.02:<br>The Chairman acknowledged the action taken, and the Experts appreciated (i) The revised courses are being offered for AY 2023-24. (ii) The course "FS101.01A Foundation course on Mathematics and Physics (Audit Course)" is being offered as an audit course from AY 2023-24. As per the resolution of the Academic Council, the proposed audit course "FS102.01A Foundation course on Chemistry and Biology" will not offered to FTE students.<br>Resolution No.20.02: The Board of Study approved the actions taken. |
| | Agenda/Item No 20.03: For Information and approval: To review and approve the Teaching & Examination schemes and detailed syllabus for the First year of Choice Based Credit System (CBCS) courses of B.Tech. (Electrical Engineering) for Electrical Engineering for July 2023 admission batch.<br>Proceeding No.20.03:<br>The courses of the First year, particularly the foundation course are discussed<br>Resolution No 20.03: The revised course will be offered as "FS101.01A Foundation course on Mathematics and Physics (Audit Course)" The T& E Scheme form AY 2023-24 for First Year is attached as Annexure 1A and the syllabus of course FS101.01A Foundation course on Mathematics and Physics (Audit Course) is attached as Annexure 1B. |
| | Agenda/Item No 20.04: For Information and approval: To review and approve the Teaching & Examination schemes and detailed syllabus for the Second year of Choice Based Credit System (CBCS) courses of B.Tech. (Electrical Engineering) for Electrical Engineering from July 2022 admission batch.<br>Proceeding No.20.04:<br>The courses of the Second year are discussed<br>Resolution No.20.04: There is no change in core courses, but one University Elective course "PH238.01 Cosmetics in Daily Life" is replaced by "PH238.02 Cosmetics in Daily Life" The T&E schemes along with a list of University electives are attached as Annexure 2 |
| | Agenda/Item No 20.05: To review and approve: Course to be added in the Sixth semester as per NEP 2020 credit transfer from SWAYAM courses.<br>Proceeding 20.05: Reviewed and shortlisted the Swayam/NPTEL Course to be introduced |

in the Sixth Semester of B.Tech. (EE) programs that align most closely with our requirements and goals and that abide with the CHARUSAT credit transfer policy.

Resolution No 20.05: The following NPTEL course is identified to add in B. Tech. (EE) curriculum for credit transfer policy.

"Microprocessors and Interfacing" 12 Week Course offered by Prof. Shaik Rafi Ahamed, IIT Guwahati (PRE-REQUISITES: Digital circuits)

Agenda/Item No 20.06: To review and approve: The Teaching & Examination schemes and detailed syllabus for the Third year of Choice-based Based Credit System (CBCS) courses of B.Tech. (Electrical Engineering) for Electrical Engineering from July 2021 admission batch.

Proceeding 20.06: Reviewed and shortlisted the Swayam/NPTEL Courses to be introduced in the Sixth Semester of B.Tech. (EE) programmes.

The courses of the Third year are discussed.

Resolution No 20.06: The new course "OCEE3001 Microprocessors and Interfacing" 12 Week Course offered by Prof. Shaik Rafi Ahamed, IIT Guwahati (PRE-REQUISITES: Digital circuits)

| Sr. No | Course Code & Course Title | Course Link & Duration | Semester | Examination Scheme | | | | Credit |
|---|---|---|---|---|---|---|---|---|
| | | | | Theory (SWAYAM) | | Practical (CHARUSAT) | | |
| | | | | Internal | External | Internal | External | |
| 1 | OCEE3001 Microprocessors and Interfacing | https://onlinecourses.nptel.ac.in/noc23_ee06/preview12 weeks (3 credits from Swayam) | VI | 25 | 75 | 25 | 25 | 4 |

The T& E Scheme form AY 2023-24 for Third Year is attached as Annexure 3A

Course "OCEE3001 Microprocessors and Interfacing" is attached as Annexure 3B

Agenda/Item No 20.07: For information: Result analysis of the End Semester Examination conducted during the odd semester of the Academic year 2022-23.

Proceeding 20.07: The records of result analysis of the University exams are maintained. The results of both the exams are generally discussed and analyzed in the department meeting as soon as the exam is over and the necessary actions are decided. The YoY comparisons of the results are also discussed and the figures are acceptable. The failure rate was 44% in the third semester due to the Mathematics course and late admission of Diploma to degree students. The total failure in the third semester was reduced to 20%

| | |
|---|---|
| | after the supplementary exam. The remedial classes and one-to-one sessions will be conducted for failed students.<br>Resolution No 20.07: The efforts should be made to improve the results at all levels. The conduction of the remedial classes for weak/slow-learner students has been appreciated by the members. The result analysis of the main exam is attached as Annexure 4. |
| | Agenda/Item No 20.08: For information: Analysis of campus placement(s)<br>Proceeding 20.08: Analysis of campus placement was presented to BoS experts. Mock tests are conducted before the placement for the students.<br>Resolution No 20.08: BoS appreciated the efforts. The placement record is attached as Annexure 5. |
| | Agenda/Item No 20.09: For Discussion and Suggestion: Discussion on effective implementation of Outcome Based Education (OBE).<br>Proceeding 20.09: Achievement of Program Outcomes were discussed.<br>Resolution No 20.09: The attainment of the Program Outcomes and its comments are attached as Annexure 6. |
| | Agenda/Item No 20.10: For information and Discussion: Technical expert scrutiny report on question papers of the odd semester of AY 2022-23.<br>Proceeding 20.10: Evaluation of University exam papers as per Bloom's taxonomy was done by faculty members. The question papers were balanced as per different levels of Bloom's taxonomy and had very good mark distribution as per the syllabus.<br>Resolution No 20.10: Experts had welcomed the approach and asked to continue this practice of drawing balanced question papers. The Analysis is listed as Annexures 7A, 7B, and 7C. |
| | Agenda/Item No 20.11: For Discussion and action taken: The feedback of the stakeholders including exit (last day) feedback of the students to improve the various best practices adopted by the departments.<br>Proceeding 20.11: Discussion was done on the feedback received.<br>Resolution No 20.11:<br>Some of the suggestions of different stakeholders, like including micro project/field work, hardware, SWAYAM courses, etc. are incorporated, and some suggestions will be incorporated in upcoming years. The students' feedback analysis is attached as Annexure 8A and the feedback analysis and action taken/plan of different stakeholders is attached as Annexure 8B. The feedback quantitative feedback received from all the students is attached as Annexure 8C. The analysis and action plan for the feedback received from all |

EE students is attached as Annexure 8D. All scanned feedback is attached as Annexure 8E.

Agenda/Item No 20.12: For Approval: Panel of examiners for winter and summer examinations (AY 2023-24).

Proceeding 20.12: list of Examiner was presented to BoS Members.

Resolution No 20.12: BoS Approved the examiner panel list, it is attached as Annexure 9.

Agenda/Item No 20.13: For review: the status of candidates pursuing Ph.D.

Proceeding 20.13: The Department of Electrical Engineering, Faculty of Technology & Engineering has received the following synopsis of research scholars during months of July and August 2023.

| Sr. No. | Research Scholar | Research Topic |
|---|---|---|
| 1 | Pratik Mochi (19DREE003) | Joint Optimization of System Cost And Profit Maximization For Customer Engagement In Local Electricity Market |
| 2 | Shanker Godwal (17DREE001) | Optimal Overcurrent Relay Coordination for Interconnected Power Systems with Proper Approaches and Improved Techniques |

The synopsis was presented by the research scholar, and the panel of referees for reviewing the thesis to be submitted by the above-mentioned scholars was placed before the BoS members.

A list of Candidates Pursuing the Ph.D. is displayed to experts.

Resolution No 20.13: Board of Studies members approved the synopsis & panel of referees, and approved for further process.

The list of Candidates Pursuing Ph.D. is as per Annexure 10.

Agenda/Item No 20.14: For Discussion and Planning: Events to be organized and planning for further events.

Proceeding 20.14:As per experts' opinions, a Training program should be organized with the help of funding agencies

Resolution No 20.14: STTP on EV can be organized with help of ATAL.

Agenda/Item No 20.15: For Discussion: enhancing research activities, project funding, consultancy work, and preparation of the action plan for the same.

Proceeding 20.15: The Department has established a Cable and Wire Testing Lab. This lab will be used for revenue generation by consultancy work and organizing certification

| | |
|---|---|
| | Proceeding 20.15: The Department has established a Cable and Wire Testing Lab. This lab will be used for revenue generation by consultancy work and organizing certification course.<br>Resolution No 20.15: The industries will be contacted for Energy Audit consultancy work |
| 16. | Additional Agenda 20.16: For Information: Innovation in pedagogy<br>Proceeding 20.16: BoS Chairman Gave information about the design Thinking Workshop arranged for the faculty member.<br>Two days workshop was arranged by HRDC-CHARUSAT for faculty members.<br>The detail of the expert is as under.<br>Dr. Bhaumik Nagar - Sr. Faculty in the New Media Design program, and Vice Activity Chairperson Continuing Education Programme, National Institute of Design – Ahmedabad.<br>The points Covered are as under.<br>An Insight into learning, Emotions: experience and expressions, Basics of design thinking, Creative Thinking and Problem Solving, Prototyping and testing.<br>Resolution No 20.16: The faculty members will embed the concepts of the design thinking in their respective courses. BoS members appreciated the concept. |

**Dr. Nilay A. Patel**
**Chairman (BoS) (EE)**

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Annexur A.1

Programme : B. Tech Electrical Annexur A.1
Criteria:1.4.1. 1.4.2 ,

## CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY (CHARUSAT)

**Item 20.06 Annexure 3A TEACHING & EXAMINATION SCHEME FOR Third Year B TECH PROGRAMME IN ELECTRICAL ENGINEERING (CBCS) Entry Year: 2021**

| Level | Course Code | Course Title | Teaching Scheme | | | | | Examination Scheme | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Contact Hours | | | | Credit | Theory | | Practical | | Total |
| | | | Theory | Practical | Tutorial | Total | | Internal | External | Internal | External | |
| Level 3 | HS131.02A | Communication and Soft Skills | | 2 | 0 | 2 | 2 | | | 30 | 70 | **100** |
| | EE351 | Electrical Power Transmission and Distribution | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 0 | 0 | **100** |
| | EE342 | Synchronous and DC Machines | 4 | 4 | 0 | 8 | 6 | 30 | 70 | 50 | 50 | **200** |
| | EE353 | Power Electronics & Drives I | 3 | 2 | 0 | 5 | 4 | 30 | 70 | 25 | 25 | **150** |
| | EE344 | Minor Project I | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | **100** |
| | EE345 | Electrical Product Survey | 0 | 2 | 0 | 2 | 2 | | | 50 | 50 | **100** |
| | EE371-EE375 | Programme Elective I | 4 | 2 | 0 | 6 | 5 | 30 | 70 | 25 | 25 | **150** |
| | EE350 | Summer Internship I | 0 | 0 | 0 | 0 | 3 | | | 75 | 75 | **150** |
| | Assignment Practices/Student counselling/Remedial classes/Library/Sports/Extra curricular & co-curricular | | | | | 6 | | | | | | |
| | | | **14** | **16** | **0** | **36** | **27** | **120** | **280** | **305** | **345** | **1050** |
| | HS132.02A | Contributory Personality Development | | 2 | 0 | 2 | 2 | | | 30 | 70 | **100** |
| | EE346 | Digital Signal Processing | 3 | 2 | 0 | 5 | 4 | 30 | 70 | 25 | 25 | **150** |
| | EE347 | Programmable Logic Controllers and Industrial Automation | 2 | 4 | 0 | 6 | 4 | 30 | 70 | 50 | 50 | **200** |
| | EE348 | Power Electronics & Drives II | 3 | 2 | 0 | 5 | 4 | 30 | 70 | 25 | 25 | **150** |
| | EE349 | Fault Analysis and Switchgear | 4 | 2 | 0 | 6 | 5 | 30 | 70 | 25 | 25 | **150** |
| | EE360 | Minor Project II | 0 | 4 | 0 | 4 | 2 | 0 | 0 | 50 | 50 | **100** |
| | EE376-EE381, | Programme Elective II | 3 | 2 | 0 | 5 | 4 | 30 | 70 | 25 | 25 | **150** |
| | OCEE3001 | Microprocessors and Interfacing | 3 | 2 | 0 | 5 | 4 | 0 | 100 | 25 | 25 | |
| | Assignment Practices/Student counselling/Remedial classes/Library/Sports/Extra curricular & co-curricular | | | | | 3 | | | | | | |
| | | | **18** | **20** | | **41** | **29** | **150** | **450** | **255** | **295** | **1000** |

# CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY (CHARUSAT)

**Item 20.06 Annexure 3A TEACHING & EXAMINATION SCHEME FOR Third Year B TECH PROGRAMME IN ELECTRICAL ENGINEERING (CBCS) Entry Year: 2021**

| Level | Course Code | Course Title | Teaching Scheme | | | | | Examination Scheme | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Contact Hours | | | | Credit | Theory | | Practical | | Total |
| | | | Theory | Practical | Tutorial | Total | | Internal | External | Internal | External | |

**CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY (CHARUSAT)**

**Electives for Level 3**

| | PROGRAMME ELECTIVE 1 (4+2) | | PROGRAMME ELECTIVE 2 (3+2) |
|---|---|---|---|
| **EE371** | Advanced Microcontrollers | **EE376** | Special Electrical Machines and Applications |
| **EE372** | VLSI Technology and Design | **EE377** | Embedded Systems |
| **EE373** | Optimization Techniques | **EE378** | Power Electronics Applications in Power System |
| **EE374** | Distributed Generation and Microgrid | **EE379** | High Voltage Engineering |
| **EE375** | Energy Conservation, Audit and Management | **EE380** | Internet of Things |
| | | **EE381** | Hybrid and Electric Vehicles |
| | | **OCEE3001** | Microprocessors and Interfacing |

| Minor Specialization for level 3 (Institute Elective II) | | Minor Specialization for level 3 (Institute Elective III) | |
|---|---|---|---|
| **CE391** | Python for Data Analytics (3+2) (4 Credit) | **EE391** | Control of Electric Motors For Vehicular Applications (4+2) (5 Credits) |
| **CE392** | Machine Learning Fundamentals (4+2) (5 Credit) | **EE392** | EV Batteries and Charging System (4+2) (5 Credits) |
| | | | |

Annexur A.2

Programme : B. Tech Electrical Annexur A.2
Criteria:1.4.1. 1.4.2 ,

Agenda 20.06 Annexure 3B

# OCEE3001: Microprocessors and Interfacing

## Description:

This course OCEE3001 – Microprocessors and Interfacing is offered from SWAYAM

**URL**: https://onlinecourses.nptel.ac.in/noc23_ee06/preview

## Credit and Week:

| Teaching Scheme | Week | Theory | Practical | Total |
|---|---|---|---|---|
| **Marks** | 12 | 100 | - | 100 |
| **Credit** | - | 3 | 1 | 4 |

## About this course:

To enable students to apply the knowledge of microprocessor interfacing. Students will be given an overview of 8086 microprocessor and comparison with 8-bit processor will be discussed. Later, the detailed architecture 0f 8086 will be discussed. The 8086 instructions will be covered with examples. Simple to complex programs using 8086 assembly language will be discussed. A peripheral device 8255 will be discussed in detail. Then, the interfacing of 8086 with several peripherals such as key board, display, stepper motor will be covered.

## Industry Support:

INTEL

## Course Layout:

**Week 1**: 8086 Architecture
**Week 2**: 8086 Pins and Signals
**Week 3**: 8086 Instruction Set I
**Week 4**: 8086 Instruction Set II
**Week 5**: Programming I
**Week 6**: Memory Interfacing and Programmable Peripheral Interface
**Week 7**: I/O Interfacing
**Week 8**: I/O Interfacing contd.
**Week 9**: I/O Interfacing and Timer
**Week 10**: Programmable Interrupt Controller (8259)
**Week 11**: Programmable DMA Controller (8237), Serial I/O
**Week 12**: Programmable Communication Interface (8251)

## Books and references:

1. Douglas V Hall and SSSP Rao, MICROPROCESSORS AND INTERFACING, McGraw Hill Education, 3rd Edition, 2017

**CRITERIA TO GET A CERTIFICATE**

Average assignment score = 25% of average of best 8 assignments out of the total 12 assignments given in the course .

Exam score = 75% of the proctored certification exam score out of 100

Final score = Average assignment score + Exam score

**YOU WILL BE ELIGIBLE FOR A CERTIFICATE ONLY IF AVERAGE ASSIGNMENT SCORE >=10/25 AND EXAM SCORE >= 30/75. If one of the 2 criteria is not met, you will not get the certificate even if the Final score >= 40/100.**

Certificate will have your name, photograph and the score in the final exam with the breakup. It will have the logos of NPTEL and IIT Madras. It will be e-verifiable at nptel.ac.in/noc.

Only the e-certificate will be made available. Hard copies will not be dispatched.

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
Accredited Grade 'A+' by NAAC
CHARUSAT Campus, Off Nadiad- Petlad Highway, Changa-388421 (GUJARAT) INDIA

**MINUTES OF THE MEETING OF THE BOARD OF STUDIES IN ELECTRICAL ENGINEERING, FACULTY OF TECHNOLOGY AND ENGINEERING HELD ON 25th February 2023 (Saturday) AT online platform Google meet.**

The 19th meeting of Board of Studies, M&V Patel Department of Electrical Engineering, Faculty of Technology and Engineering (FTE), Charotar University of Science and Technology (CHARUSAT) was held on 25/02/2023 at 9:30 am. On online platform. Following members were present:

Members Present

| Sl. No. | Name | Designation |
|---|---|---|
| 1. | Dr. Nilay Patel | **Chairman** |
| 2. | Dr. Kartik Pandya | Member |
| 3. | Dr. Mihir A. Bhatt | Member |
| 4. | Dr. Jigar Sarda | Member |
| 5. | Mr. Soaib Saiyad | Member |
| 6. | Mr. Jivanadhar Joshi | Member |
| 7. | Dr. Santosh Vora | External Member |
| 8. | Dr. V K Shah | External Member |
| 9. | Mr. Dhaval Patel | Alumni Member |
| 10. | Patel Nishita Alpesh | Student Member |
| 11. | Patel Vidhi Rajesh | Student Member |

Following Members were absent.

| Sl. No. | Name | Designation |
|---|---|---|
| 1. | Dr. Y. P. Kosta | Member |
| 2. | Dr. Praghnesh Bhatt | External Member |
| 3. | Dr. Naran Pindoriya | External Member |
| 4. | Mr. Darshan Shulka | External Member |
| 5. | Mr. Sanjay Mahagaokar | External Member |
| 6. | Dr. Satish H Chetwani, | External Member |

Initiation:
Dr. Nilay Patel welcomed all the members of Board of Studies.
The following resolutions were made in the BoS,

| | |
|---|---|
| 1. | Agenda/Item No 19.01: For Confirmation: Minutes of 18th Board of Studies meeting held on Thursday, 6th October 2022.<br>Proceeding & Resolution No 19.01: The 18th Meeting of Board of Study was held on 6th October, 2022. The minutes were circulated on 12th October 2022. As there were no comments received from any member, the minutes were confirmed by the Board of Study. |
| 2. | Agenda No.19.02: For approval: Action taken on the agenda items of the 18th Board of Study Meeting.<br>Proceeding No.19.02:<br>The Chairman acknowledged the action taken, and the Experts appreciated (i) implementation of certificate course on "Cable and wire testing as per Indian Standards".<br>Resolution No.19.02: The actions taken were approved by the Board of Study. |
| 3. | Agenda/Item No 19.03: For Information and approval: To discuss the pedagogical interventions incorporated in the syllabi of courses, and strategy to align the teaching - learning processes to outcome based education.<br>Proceeding No.19.03:<br>The Chairman show the pedagogical interventions incorporated in the syllabi of courses, and strategy to align the teaching - learning processes to outcome based education. Experts advised not to disclose detailed breakup of marking to the students.<br>Resolution No.19.03: The BoS Members appreciated and approved the micro projects involved in the pedagogical interventions. The new pedagogical strategy will be implemented from AY 2023-24. The sample is attached as Annexure 1. |
| 4. | Agenda/Item No 19.04: For Information and approval: Foundation courses to be offered as audit course instead of credit course.<br>Proceeding No.19.04:<br>Two foundation courses are being offered in first year of B.Tech. (Electrical Engineering) the courses are as under<br>FS101A Foundation Course on Mathematics and Physics (2 Credits) |

| | |
|---|---|
| | FS102A Foundation Course on Chemistry and Biology. (2 Credits)<br>The above courses will be offered as audit courses to the students from AY 2023-24 as a part of curriculum. The mesoscopic-3D contents will be installed in students' device for better understanding of concepts. The code of the updated courses are as under.<br>FS101.01A Foundation Course on Mathematics and Physics (0 Credits)<br>FS102.01A Foundation Course on Chemistry and Biology. (0 Credits)<br>Resolution No.19.03: BoS members approved the agenda. Total credits of the B.Tech. Electrical Engineering for Entry year 2023-24, under Choice based Credit System will be 176. The T&E schemes are attached as Annexure 2 |
| 5. | Agenda/Item No 19.05: To review and approve the Teaching & Examination schemes and detailed syllabus of Choice Based Credit System (CBCS) courses of B.Tech. (Electrical Engineering).<br>Proceeding 19.05: The contents of the 4th year, 7th semester program elective course, EE476.01 Advances in Power System is discussed and revised as per current need. This course will be offered from AY 2023-24.<br>Resolution No 19.05: The revised course will be offered as EE476.02 Advances in Power System. The T& E Scheme form AY 2023-24 for Final Year is attached as Annexure 3A and the syllabus of course EE476.02 Advanced in Power system is attached as Annexure 3B. |
| 6. | Agenda/Item No 19.06: For Approval: Revised Syllabi and Teaching and Examination scheme of Minor specialization courses for B. Tech. Electrical Engineering Program (Applicable from Academic Year 2023-24). Approval of Certification Course.<br>Proceeding 19.06: One course from the group of Minor Specialization "Electrical Vehicle Systems" *EE491 Electric Vehicles in Smart Grid* is revised as per current needs and to align the contents with the MG Motors Certification Courses of Basic and advanced level. The course EE491 is going to offer first time hence it course code will not change.<br>The certification course will be taken by any students of Electrical Engineering, |

| | |
|---|---|
| | Mechanical Engineering and Electronics & Communication branch.<br>The requirements of the certification course offered in collaboration of MG Motors and CHARUSAT has been embedded in the courses of Minor specialization.<br>Resolution No 19.06: The BoS members approve the certification course and the contents of EE491 Electric Vehicles in Smart Grid. The course is attached as Annexure 4A and content of certification course is attached as Annexure 4B. |
| 7. | Agenda/Item No 19.07: For information: Result analysis of the End Semester Examination conducted during the odd semester of Academic year 2022-23.<br>Proceeding 19.07: The records of result analysis of the University exams are maintained. The results of both the exams are generally discussed and analyzed in the department meeting as soon as the exam gets over and the necessary actions are decided. The YoY comparisons of the results are also discussed and the figures are acceptable. The failure rate was 44% in third semester due to Mathematics course and late admission of Diploma to degree students. The total failure in third semester was reduced to 20% after supplementary exam. The remedial classes and one to one sessions will be conducted for failed students.<br>Resolution No 19.07: The efforts should be given to improve the results at all levels. The conduction of the remedial classes for weak/slow-learner students has been appreciated by the members. The result analysis of main exam is attached as Annexure 5. |
| 8. | Agenda/Item No 19.08: For information: Analysis of campus placement(s)<br>Proceeding 19.08: Analysis of campus placement was presented to BoS experts. Mock tests are conducted before the placement for the students.<br>Resolution No 19.08: BoS appreciated the efforts. The placement record is attached as Annexure 6. |
| 9. | Agenda/Item No 19.09: For Discussion and Suggestion: Discussion on effective implementation of Outcome Based Education (OBE).<br>Proceeding 19.09: Achievement of Program Outcomes were discussed.<br>Resolution No 19.09: The attainment of the Program Outcomes and its comments are attached as Annexure 7. |
| 10. | Agenda/Item No 19.10: For information and Discussion: Technical expert scrutiny |

| | |
|---|---|
| | report on question papers of odd semester of AY 2022-23.<br>Proceeding 19.10: Evaluation of University exam papers as per bloom's taxonomy were done by faculty members. The question papers were balanced as per different levels of blooms taxonomy and had very good mark distribution as per syllabus.<br>Resolution No 19.10: Experts had welcomed the approach and asked continuing this practice of drawing balanced question paper. The Analysis is listed as Annexures 8A, 8B and 8C. |
| 11. | Agenda/Item No 19.11: For Discussion: The feedback of the stakeholders obtained till date.<br>Proceeding 19.11: Discussion done on the feedback received.<br>Resolution No 19.11: The suggestion will be incorporated. The analysis of feedback is attached as Annexure 9A and action plan/action taken is attached as Annexure 9B. |
| 12. | Agenda/Item No 19.12: For Discussion and Planning: Events to be organized and planning for further events.<br>Proceeding 19.12: as per experts opinions, Training program should be organized with help of funding agencies<br>Resolution No 19.12: FDP on ANSYS software can be organized. |
| 13. | Agenda/Item No 19.13: For Discussion and planning: the current admission trend(s) and how to sustain on uncertain demands of the engineering streams.<br>Proceeding 19.13: Various strategy was suggested by BoS experts including one to one counselling, activities for 12th pass out students. Making testimonials of existing students and alumni.<br>Resolution No 19.13: The experts were well aware about the current admission, and advised to keep continuing efforts for admission counselling. |

**Dr. Nilay A. Patel**

**Chairman (BoS) (EE)**

Item 19.06 Annexure 4A

# EE491: ELECTRIC VEHICLES IN SMART GRID
## 7th Semester and 4th Year (Level IV)
## B. Tech. (Electrical Engineering)
## Minor Specialization Subject-4
## Institute Elective

### A. Credit Hours:

| Teaching Scheme | Theory | Practical | Total | Credit |
|---|---|---|---|---|
| Hours/week | 4 | 2 | 6 | 5 |
| Marks | 100 | 50 | 150 | |

### B. Examination Scheme:

| Theory Marks | | Practical Marks | | Total Marks |
|---|---|---|---|---|
| Internal | External | Internal | External | |
| 30 | 70 | 25 | 25 | 150 |

### C. Course Objectives:

As electrical power generation and economy is essential gradient for the industrial and all around development of any country, the objectives of the course are:

1. To understand the economics and effects on grid during charging.
2. To identify the impacts on system demand and on distribution system during different penetration level of EV charging.
3. To design control strategies for EVs to support frequency control of power system
4. To develop solutions based on ICT to support EV deployment.
5. To understand different protocol for grid interfacing and communication related to EVs.

### D. Outline of the Course:

| Sr. No. | Title of Units | Number of Hours |
|---|---|---|
| 1 | Introduction to EVs in Smart Grid | 10 |
| 2 | Influence Of EVs On Power System | 15 |
| 3 | Frequency Control Reserves & Voltage Support From EVs | 17 |
| 4 | ICT Solutions To Support EVs Deployment | 12 |
| 5 | Vehicular communication | 06 |

| | | |
|---|---|---|
| Total hours (Theory) | : | 60 Hrs |
| Total hours (Lab) | : | 30 Hrs |
| Total hours | : | 90 Hrs |

**E. Detailed Syllabus:**

| | | | |
|---|---|---|---|
| 1 | Introduction to EVs in Smart Grid | 10 Hours | 16.67% |

Introduction, Impact of charging strategies, EV charging options and infrastructure, energy, economic and environmental considerations, V2G ,G2V and V2V Technology ,PEVs Charging Infrastructures ,Impact of EV charging on power grid, effect of EV charging on generation and load profile, Smart charging technologies, Impact on investment

| | | | |
|---|---|---|---|
| 2 | INFLUENCE OF EVS ON POWER SYSTEM | 15 Hours | 25% |

Introduction, identification of EV demand, EV penetration level for different scenarios, classification based on penetration level, EV impacts on system demand: dumb charging, multiple tariff charging, smart charging, case studies, Effect of large scale EV charging on Distribution Systems.

| | | | |
|---|---|---|---|
| 3 | FREQUENCY CONTROL RESERVES & VOLTAGE SUPPORT FROM EVS | 17 Hours | 28.33% |

Introduction, power system ancillary services, electric vehicles to support wind power integration, electric vehicle as frequency control reserves and tertiary reserves, voltage support and electric vehicle integration, properties of frequency regulation reserves, control strategies for EVs to support frequency regulation.

| | | | |
|---|---|---|---|
| 4 | ICT SOLUTIONS TO SUPPORT EV DEPLOYMENT | 12 Hours | 20% |

Introduction, Architecture and model for smart grid & EV, ICT players in smart grid, smart metering, information & communication models, functional and logical models, technology and solution for smart grid: interoperability, communication technologies.

| | | | |
|---|---|---|---|
| 5 | Vehicular communication | 06 Hours | 10% |

Communication within vehicle, with grid, digital communication systems, vehicle network theory, embedded control, actuators, data analysis and importance of data in

maintainability, concept of driverless car , NETWORKS AND PROTOCOLS : Overview of general-purpose networks and protocols -Ethernet, TCP, UDP, IP,ARP,RARP - LIN standard overview –workflow concept-applications –LIN protocol specification –signals - Frame transfer –Frame types –Schedule tables –Task behaviour model –Network management –status management - overview of CAN –fundamentals –Message transfer – frame types-Error handling –fault confinement-Bit time requirements.

**F. Revised Bloom's Taxonomy**

The below specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary from the below table.

| Level | | | | | |
|---|---|---|---|---|---|
| **Remembrance** | **Understanding** | **Application** | **Analyze** | **Evaluate** | **Create** |
| 20 | 25 | 20 | 15 | 15 | 5 |

**G. Course Outcomes (COs):**

Upon successful completion of this course, a student would be able to

| | |
|---|---|
| **CO1:** | Understand the economics and effects on grid during charging. |
| **CO2:** | Identify the impacts on system demand and on distribution system during different penetration level of EV charging. |
| **CO3:** | Design control strategies for EVs to support frequency control of power system |
| **CO4:** | Develop solutions based on ICT to support EV deployment. |
| **CO5:** | Understand different protocol for grid interfacing and communication related to EVs. |

**Mapping of course outcomes with program outcomes**

**Course Articulation Matrix:**

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** | 3 | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO2:** | 3 | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO3:** | 3 | 2 | 3 | 1 | 2 | - | 2 | - | 1 | - | 1 | 2 | 2 | - |
| **CO4:** | 3 | 3 | 3 | 2 | 2 | - | 2 | - | 1 | - | 1 | 2 | 2 | - |
| **CO5:** | 3 | 1 | - | - | - | 1 | - | - | - | - | - | - | - | - |

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) No correlation "-"

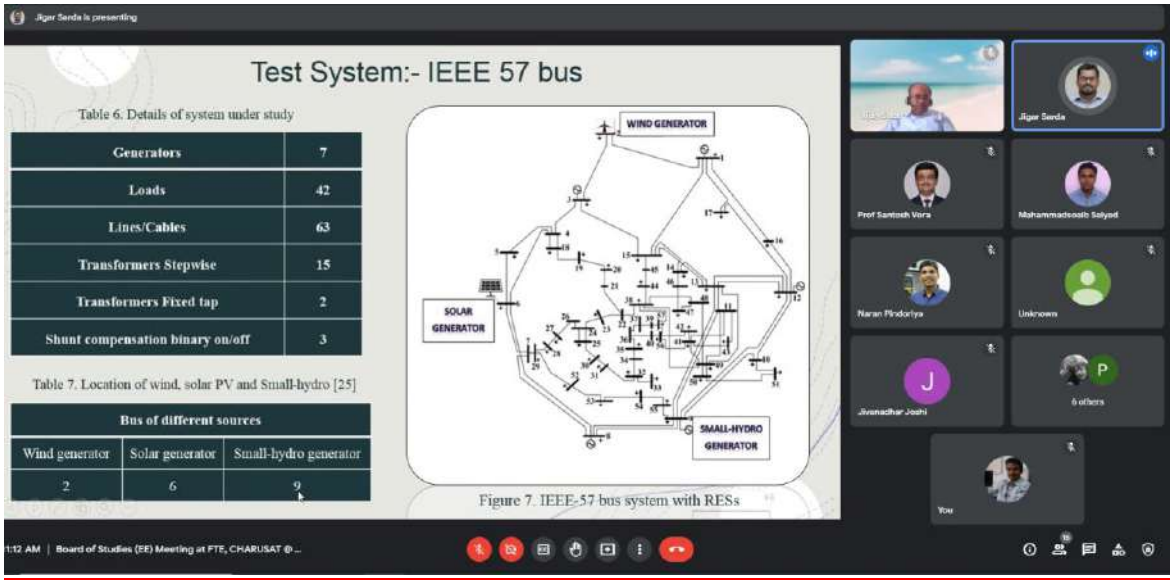
## H. Instructional Methods and Pedagogy

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures which carries a 10% component of the overall evaluation.
- Minimum two internal exams will be conducted and average of two will be considered as a part of 15% overall evaluation.
- Assignments/Surprise tests/Quizzes/Seminar/Tutorials based on course content will be given to the students for each unit/topic and will be evaluated at regular interval. It carries a weightage of 5% in the overall evaluation.
- The visit of CHARUSAT MEDICAL Campus HT control room and nearby substation will clear the concept of relay and relay setting and student will realize the actual application of relay.
- In lab session, the student will calculate the relay setting for particular application, will set the calculated value in relay and by performing the practical, and realize the operation of relay under pre-determined conditions.

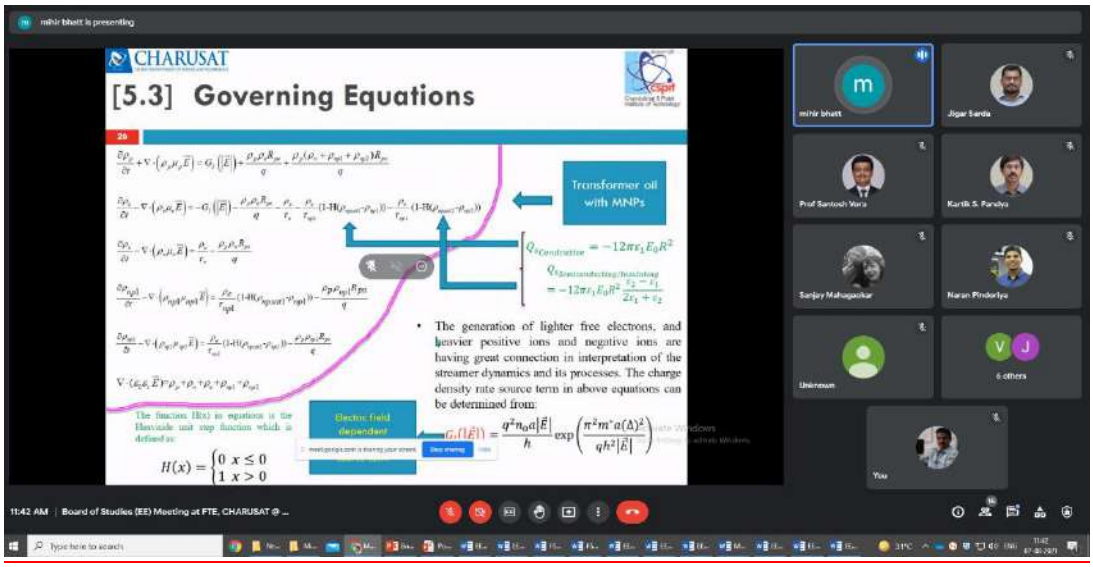
## I. Recommended Study Material:

| Text Books: | |
|---|---|
| 1. | SumedhaRajakaruna, FarhadShahnia and Arindam Ghosh, "Plug In Electric Vehicles inSmart Grids-Integration Techniques", Springer Science + Business Media Singapore PtLtd., 2015. |
| 2. | Canbing Li, Yijia Cao, YonghongKuang and Bin Zhou, "Influences of Electric Vehicles on |

| | |
|---|---|
| | Power System and Key Technologies of Vehicle-to-Grid", Springer-Verlag Berlin Heidelberg, 2016. |
| 3. | James Larminie and John Loury, "Electric Vehicle Technology – Explained", John Wiley & Sons Ltd, 2003 |
| **Reference Books:** | |
| 1. | Qiuwei Wu, "GRID INTEGRATION OF ELECTRIC VEHICLES IN OPEN ELECTRICITY MARKETS", John Wiley & Sons, Ltd, 2013. |
| **Web Material:** | |
| | |
| | |
| | |
| **Other Material:** | |
| | |
| | |




mihir bhatt is presenting
CHARUSAT
BoS Synopsis
Seminar on
INVESTIGATING POSITIVE STREAMER DYNAMICS IN TRANSFORMER OIL BASED HYBRID NANOFLUIDS
PhD Supervisor
Dr. Praghnesh J Bhatt
Associate Professor & Head
Electrical Engineering Department
PDEU, Gandhinagar
Mihir Bhatt, Research Scholar, (16DREE002)
Department of Electrical Engineering
Chandubhai S. Patel Institute of Technology, Charotar
mihir bhatt
Jigar Sarda
Prof Santosh Vora
Kartik S. Pandya
Sanjay Mahagaokar
Naran Pindoriya
Vijay Shah
7 others
You
11:33 AM | Board of Studies (EE) Meeting at FTE, CHARUSAT @ ...


mihir bhatt is presenting
CHARUSAT
[5.3] Governing Equations
Transformer oil with MNPs
Electric field dependent
The generation of lighter free electrons, and heavier positive ions and negative ions are having great connection in interpretation of the streamer dynamics and its processes. The charge density rate source term in above equations can be determined from:
The function H(x) in equations is the Heaviside unit step function which is defined as:
$H(x) = \begin{cases} 0 & x \le 0 \\ 1 & x > 0 \end{cases}$
mihir bhatt
Jigar Sarda
Prof Santosh Vora
Kartik S. Pandya
Sanjay Mahagaokar
Naran Pindoriya
Unknown
6 others
You
11:42 AM | Board of Studies (EE) Meeting at FTE, CHARUSAT @ ...

Programme : B. Tech Electrical Annexur B.2
Criteria 1 : 1.1, 1.2

# Annexur B.2 Fundamentals (EV + Autonomous + Connected)

| Sr No | Course Title | Topics covered | Course Duration (in hrs) |
|---|---|---|---|
| 1 | Introduction to EV Systems and Battery Technology<br><br>**TOOLS**: Simscape<br>MATLAB & SIMULINK | Basics of Electric Vehicle Overview | Live Session:7<br>Q& A Sessions: 3 |
| | | Vehicle Dynamics (Governing Equations and Simulations) | |
| | | Defining the component sizing( Battery Pack, Electrical Machine, Traction Inverter, DC-DC Convertor and Onboard Charger) | |
| | | Drive cycle Simulation of EV Components in MATLAB and Simulink (Battery cell, Power Electronics, Electrical Machine simulation) | |
| | | Basics of Lithium-ion cells | Live Session:7<br>Q& A Sessions: 3 |
| | | Battery Management System, Hardware, Software Function, Communication Protocol | |
| | | Battery Thermal Management System | |
| | | Function Safety associated with Battery Pack and BMS System, Battery charging system: On board charger and charging station | Live Session:7<br>Q& A Sessions: 3 |

# Fundamentals (EV + Autonomous + Connected)

| Sr No` | Course Title | Topics covered | Course Duration (in hrs) |
|---|---|---|---|
| 2 | Autonomous Vehicle Essentials<br><br>**TOOLS:** Carla<br>MATLAB® & SIMULINK® | Overview of ADAS and Autonomous vehicle Technology- SAE levels of ADAS/ AD Software Stack Architecture | Live Session: 10<br>Q& A Sessions: 5 |
| | | Overview of ADAS Features LDW/ LCA /LKA , ACC, IHC, Blind Spot Detection, Forward Collision Warning, Automatic Emergency Braking | |
| | | Introduction to Simulation for ADAS/ AD- Commons tools and Platform sensors , Map , Traffic | |
| | | Introduction to ADAS Software Testing Process- Unit/ System/ Integration Testing | |
| 3 | Connected Vehicle Fundamental | Overview of Wireless Network for Connected Vehicles | Live Session: 10<br>Q& A Sessions: 5 |
| | | Standards for Autonomous Vehicle Applications | |
| | | Transmission & Receiver Systems , Radio Transmission Concepts for Automotive Application | |
| | | Wireless Networking and Applications to Vehicle Autonomy | |
| | | Basics of Computer Networking – the Internet of Things | |
| | | Wireless Networking Fundamentals & Overview to 2G to 5G Networks for Automotive Application | |

# Advanced (EV+ Autonomous + Connected)



| Sr No | Course Title | Topics covered | Course duration (in hrs) |
|---|---|---|---|
| 1 | EV Traction system and Diagnostic<br><br>**TOOLS:** Simscape<br>MATLAB & SIMULINK | Traction System Topology for EV Applications | Live Session:20<br>Q& A Sessions: 10 |
| | | EV Powertrain Architecture and design , High voltage safety | |
| | | Onboard charger and Charging Station | |
| | | Failure mode Analysis and Diagnostic | |
| | | Maintenance Guidelines and Troubleshooting for EV | |
| 2 | Computer Vision for Autonomous Vehicle<br><br>**TOOLS:** Python, OpenCV | Intro to Computer Vision , Image processing technique | Live Session: 10<br>Q& A Sessions: 5 |
| | | Edge and Line Detection Techniques-CANNY/ HOUGH Transformation | |
| | | Projective and Stereo Geometry, 3D Computer Vision | |
| | | Feature Extraction- Image Classification using ANN,CNN, PCA (Principal Component Analysis) | |

# EV Advanced + Autonomous + Connected



| Sr No | Course Title | Topics covered | Practice duration (in hrs) |
|---|---|---|---|
| 3 | Connected Car Technology | Integration of Wireless Networking and On-Board Vehicle Networks | Live Session: 10<br>Q& A Sessions: 5 |
| | | Review of On-Board Networks – Use & Function for Cars | |
| | | Connectivity Fundamentals (Car to Networks and within Car) | |
| | | Navigation and Other Applications | |
| | | Vehicle-to-Vehicle Technology and Applications - V2V | |
| | | Vehicle-to-Roadside and Vehicle-to-Infrastructure Applications - V2X | |
| | | Wireless Security Overview And how it impacts Connected cars | |
| | | In Car Assistance, Multimedia and Infotainment, Android Auto/ Apple Car play, Car as a Platform, Fastag, GPS, Introduction to Automotive Cybersecurity | |
| | | Building a connected Vehicle Platform connecting vehicles, storing and analysing data and building consumer application as a Case Study | |

**CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY**

Date : 21/07/2022

**CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY**

**BACHELOR OF TECHNOLOGY**

**Syllabus Details**

**Effective Year 2022-23**

**Program** : BTECH(EE)
**Semester** : 7
**Total Subjects** : 7
**Total Regular Subjects** : 5
**Total Elective Subjects** : 2

**Group Name** : Regular

| Course Code | Course Title | Teaching Scheme | | | | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CREDIT | | | | TOTAL HOURS | TH | | PR | | PRJ | | |
| | | TH | PR | PRJ | TOTAL | | Internal | External | Internal | External | Internal | Externa | TOTAL |
| EE441 | POWER SYSTEM OPERATIONS AND CONTROL | 4.00 | 1.00 | | 5.00 | 6.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE442 | POWER SYSTEM PROTECTION | 4.00 | 1.00 | | 5.00 | 6.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE443 | ELECTRICAL MACHINE DESIGN | 4.00 | 1.00 | | 5.00 | 6.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE444 | SIMULATION LAB | | 2.00 | | 2.00 | 4.00 | - | - | 0/50 | 20/50 | - | - | 100 |
| EE450 | SUMMER INTERNSHIP II | | 3.00 | | 3.00 | 3.00 | - | - | 0/75 | 30/75 | - | - | 150 |
| | | | | | **20.00** | **25.00** | | | | | | | **700** |

**Group Name** : MS Elective-I

| Course Code | Course Title | Teaching Scheme | | | | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CREDIT | | | | TOTAL HOURS | TH | | PR | | PRJ | | |
| | | TH | PR | PRJ | TOTAL | | Internal | External | Internal | External | Internal | Externa | TOTAL |
| CE491 | DEEP LEARNING APPLICATIONS AND AI | 4.00 | 1.00 | | 5.00 | 6.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| | | | | | | | | | | | | | |

**Group Name** : Elective-III

| Course Code | Course Title | Teaching Scheme | | | | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CREDIT | | | | TOTAL HOURS | TH | | PR | | PRJ | | |
| | | TH | PR | PRJ | TOTAL | | Internal | External | Internal | External | Internal | Externa | TOTAL |
| EE446.01 | COMMISSIONING AND TESTING OF ELECTRICAL EQUIPMENT | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE447.01 | MODELING AND CONTROL OF RENEWABLE ENERGY SOURCES | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE472.01 | COMMUNICATION ENGINEERING | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE476.01 | ADVANCES IN POWER SYSTEM | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE481 | INDUSTRY 4.0 | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE482 | SMART GRID TECHNOLOGIES AND APPLICATIONS | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| | | | | | | | | | | | | | |

| | | |
|---|---|---|
| **Total Credit for Regular Subjects** | : | 20.00 |
| **Total Credit for Elective Subjects** | : | 9.00 |
| **Total Credit** | : | 29.00 |

**CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY**

Date : 21/07/2022

**CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY**

**BACHELOR OF TECHNOLOGY**

**Syllabus Details**

**Effective Year 2022-23**

| | | | |
|---|---|---|---|
| **Program** | : BTECH(EE) | **Semester** | : 7 |
| **Total Subjects** | : 7 | | |
| **Total Regular Subjects** | : 5 | | |
| **Total Elective Subjects** | : 2 | | |

**Examination Grade Range & Value**

| Grade | Grade Points | From Marks | To Marks |
|---|---|---|---|
| AA | 10.00 | 80 | 100 |
| AB | 9.00 | 73 | 79 |
| BB | 8.00 | 66 | 72 |
| BC | 7.00 | 60 | 65 |
| CC | 6.00 | 55 | 59 |
| CD | 5.00 | 50 | 54 |
| DD | 4.00 | 45 | 49 |
| FF | 0.00 | 0 | 44 |

Annexur C.1

Programme : B. Tech Electrical Annexur C.1
Criteria:1.4.1. 1.4.2 ,

**CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY**

Date : 27/04/2022

**CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY**

**BACHELOR OF TECHNOLOGY**

**Syllabus Details**

**Effective Year 2022-23**

**Program** : BTECH(EE)
**Total Subjects** : 8
**Total Regular Subjects** : 6
**Total Elective Subjects** : 2

**Semester** : 6

**Group Name** : Regular

| Course Code | Course Title | Teaching Scheme | | | | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CREDIT | | | | TOTAL HOURS | TH | | PR | | PRJ | | TOTAL |
| | | TH | PR | PRJ | TOTAL | | Internal | External | Internal | External | Internal | Externa | |
| EE346 | DIGITAL SIGNAL PROCESSING | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE347 | PROGRAMMABLE LOGIC CONTROLLERS AND INDUSTRIAL AUTOMATION | 2.00 | 2.00 | | 4.00 | 6.00 | 0/30 | 28/70 | 0/50 | 20/50 | - | - | 200 |
| EE348 | POWER ELECTRONICS AND DRIVES II | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE349 | FAULT ANALYSIS AND SWITCHGEAR | 4.00 | 1.00 | | 5.00 | 6.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE360 | MINOR PROJECT II | | 2.00 | | 2.00 | 4.00 | - | - | 0/50 | 20/50 | - | - | 100 |
| HS132.02 A | CONTRIBUTORY PERSONALITY DEVELOPMENT | | 2.00 | | 2.00 | 2.00 | - | - | 0/30 | 28/70 | - | - | 100 |
| | | | | | **21.00** | **28.00** | | | | | | | **850** |

**Group Name** : MS Elective-I

| Course Code | Course Title | Teaching Scheme | | | | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CREDIT | | | | TOTAL HOURS | TH | | PR | | PRJ | | TOTAL |
| | | TH | PR | PRJ | TOTAL | | Internal | External | Internal | External | Internal | Externa | |
| CE392 | MACHINE LEARNING FUNDAMENTALS | 4.00 | 1.00 | | 5.00 | 6.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE392 | EV BATTERIES AND CHARGING SYSTEM | 4.00 | 1.00 | | 5.00 | 6.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| | | | | | | | | | | | | | |

**Group Name** : Elective-II

| Course Code | Course Title | Teaching Scheme | | | | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CREDIT | | | | TOTAL HOURS | TH | | PR | | PRJ | | TOTAL |
| | | TH | PR | PRJ | TOTAL | | Internal | External | Internal | External | Internal | Externa | |
| EE376 | SPECIAL ELECTRICAL MACHINES AND APPLICATIONS | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE377 | EMBEDDED SYSTEMS | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE378 | POWER ELECTRONICS APPLICATIONS IN POWER SYSTEM | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE379 | HIGH VOLTAGE ENGINEERING | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE380 | INTERNET OF THINGS | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| EE381 | HYBRID AND ELECTRIC VEHICLES | 3.00 | 1.00 | | 4.00 | 5.00 | 0/30 | 28/70 | 0/25 | 10/25 | - | - | 150 |
| | | | | | | | | | | | | | |

**CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY**

Date : 27/04/2022

**CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY**

**BACHELOR OF TECHNOLOGY**

**Syllabus Details**

**Effective Year 2022-23**

**Program** : BTECH(EE)
**Total Subjects** : 8
**Total Regular Subjects** : 6
**Total Elective Subjects** : 2

**Semester** : 6

| | | |
|---|---|---|
| **Total Credit for Regular Subjects** | : | 21.00 |
| **Total Credit for Elective Subjects** | : | 9.00 |
| **Total Credit** | : | 30.00 |

**Examination Grade Range & Value**

| Grade | Grade Points | From Marks | To Marks |
|---|---|---|---|
| AA | 10.00 | 80 | 100 |
| AB | 9.00 | 73 | 79 |
| BB | 8.00 | 66 | 72 |
| BC | 7.00 | 60 | 65 |
| CC | 6.00 | 55 | 59 |
| CD | 5.00 | 50 | 54 |
| DD | 4.00 | 45 | 49 |
| FF | 0.00 | 0 | 44 |

Annexur D

Programme : B. Tech Electrical Annexur D
Criteria:1.4.1. 1.4.2 ,

**CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY**

Date : 27/04/2022

**CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY**

**BACHELOR OF TECHNOLOGY**

**Syllabus Details**

**Effective Year 2022-23**

**Program** : BTECH(EE)
**Total Subjects** : 1
**Total Regular Subjects** : 1
**Total Elective Subjects** :

**Semester** : 8

**Group Name** : Regular

| Course Code | Course Title | Teaching Scheme | | | | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CREDIT | | | | TOTAL HOURS | TH | | PR | | PRJ | | |
| | | TH | PR | PRJ | TOTAL | | Internal | External | Internal | External | Internal | Externa | TOTAL |
| EE458 | MAJOR PROJECT | | 20.00 | | 20.00 | 36.00 | - | - | 0/400 | 160/400 | - | - | 800 |
| | | | | | **20.00** | **36.00** | | | | | | | **800** |

| | | |
|---|---|---|
| **Total Credit for Regular Subjects** | : | 20.00 |
| **Total Credit for Elective Subjects** | : | 0.00 |
| **Total Credit** | : | 20.00 |

**Examination Grade Range & Value**

| Grade | Grade Points | From Marks | To Marks |
|---|---|---|---|
| AA | 10.00 | 80 | 100 |
| AB | 9.00 | 73 | 79 |
| BB | 8.00 | 66 | 72 |
| BC | 7.00 | 60 | 65 |
| CC | 6.00 | 55 | 59 |
| CD | 5.00 | 50 | 54 |
| DD | 4.00 | 45 | 49 |
| FF | 0.00 | 0 | 44 |

Annexur E

CHARUSAT
CHARUTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

**Nilay Patel <nilaypatel.ee@charusat.ac.in>**

## Cognizance 2k24 - Techfest of FTE, CHARUSAT

1 message

Programme : B. Tech Electrical Annexur E
Criteria:1.4.1. 1.4.2 ,

**Principal CSPIT** <principal.cspit@charusat.ac.in> Sat, Dec 16, 2023 at 11:22 AM
To: Charusat Family <charusatfamily@charusat.ac.in>

Dear all,
Greetings!!
We are thrilled to extend an invitation to you for the Technical Festival of the Faculty of Technology & Engineering, CHARUSAT - **Cognizance 2K24**. Cognizance is a dynamic gathering that promises a blend of engaging technical and non-technical activities having the concept theme of **dream | explore | innovate**. We believe there's something for everyone, and we'd love to have you join us for an unforgettable experience.

**Event Details:**

**Dates**: January 18- 19, 2024
**Website**: https://www.cognizance2k24.in

Explore the latest advancements in technology through a series of cutting-edge technical events. From coding competitions to hands-on workshops, our lineup is designed to challenge and inspire. Beyond the binary, we have an array of non-technical events that cater to diverse interests.

Visit our official website to view the event descriptions and registration information. Feel free to bring friends, colleagues, or anyone who shares a passion for learning and exploration.

Together, let's make CZ'24 an unforgettable celebration of knowledge and creativity.

We look forward to welcoming you at Cognizance 2k24.

Regards,

Trushit Upadhyaya

--
I/c Principal
Chandubhai S Patel Institute of Technology
Faculty of Technology & Engineering
Charotar University of Science & Technology (CHARUSAT)
CHARUSAT Campus, Changa, 388421
Petlad, Anand
Gujarat, India.