

|                    |                                                           |            |
|--------------------|-----------------------------------------------------------|------------|
| <b>CRITERION 2</b> | <b>Program Curriculum and Teaching-Learning Processes</b> | <b>100</b> |
|--------------------|-----------------------------------------------------------|------------|

## 2.1. PROGRAM CURRICULUM (30)

### 2.1.1 State the Process for Designing the Program Curriculum (10):

**Step 1:** To strengthen the teaching and learning process, curriculum is modified for every three years by introducing contemporary emerging areas of Electrical Engineering.

**Step 2:** Department Undergraduate Committee (DUGC) is formulated once in every three years having HOD as Chairman, all faculty members and one faculty from other department as a member. The committee collects feedback, suggestions, and modifications, if any, from stakeholders and submits the same to the course instructor to prepare curriculum.

**Step 3:** The course instructors prepare and submit a tentative draft after thorough study of the report given by DUGC. The committee analyses and evaluates all the issues mentioned in the draft related to feedback and direct the instructor to draft a curriculum aligned with PEOs, PSOs and Pos.

**Step 4:** The draft after approval of the DUGC, the chairman of DUGC sent to Program Assessment Committee (PAC) for their comments.

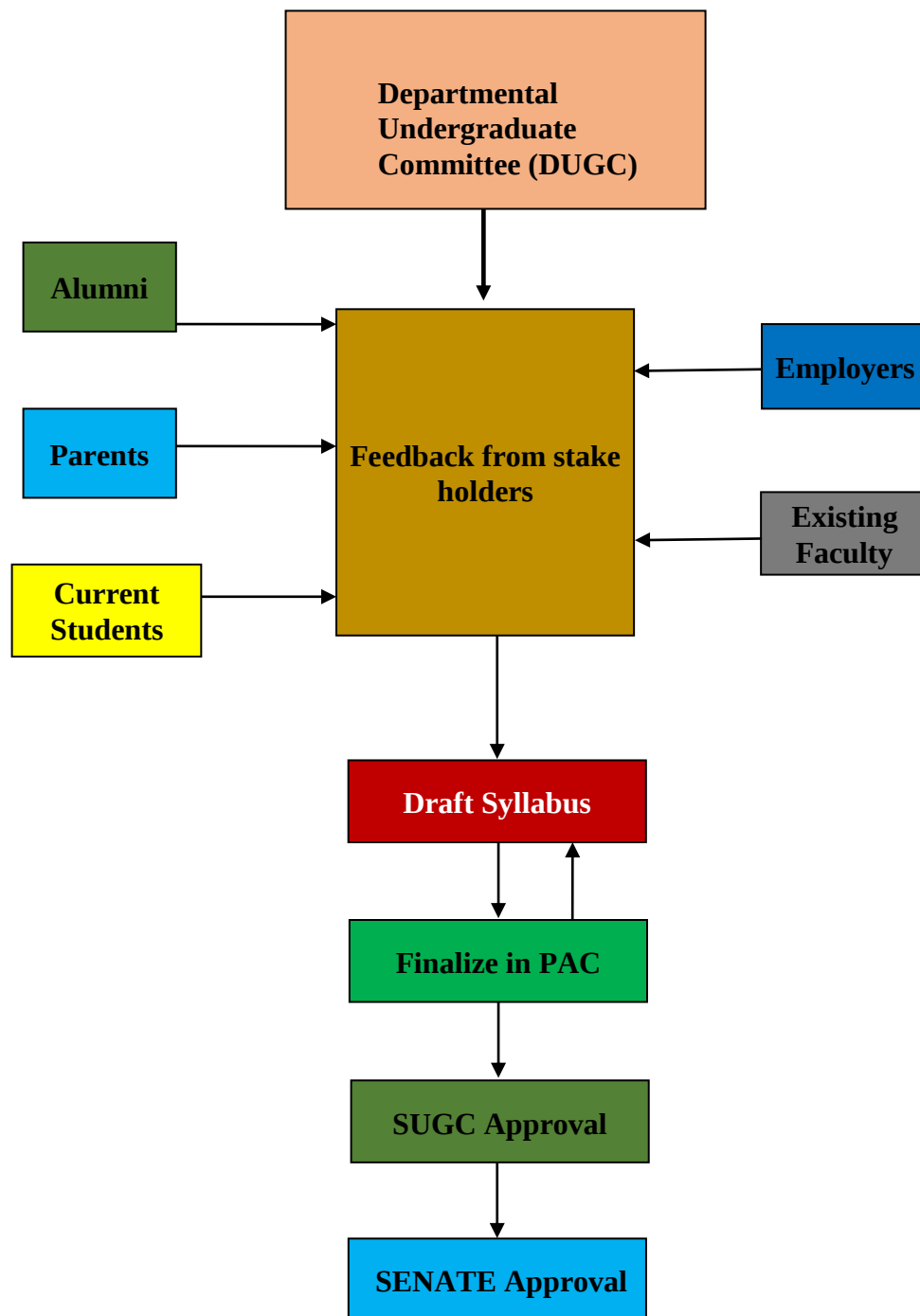
**Step 5 :** The PAC submits the same to the Departmental Assessment Board (DAB), chaired by the HOD. Again the curriculum is subjected to evaluation so that the contents fulfill all the statutory requirements, else it is again returned for review.

**Step 6:** Redrafting the curriculum is made on the basis of valuable comments into consideration, the final draft ready for Senate Undergraduate Committee (SUGC) approval.

**Step 7:** Taking the comments of the members of SUGC into consideration final draft syllabus would be put to the approval of Senate.

**Step 8:** The final draft would be circulated and disseminated to various stakeholders.

The design and development of curriculum is explained in the flow chart given here under



*Figurea: Process of designing the program curriculum*

## 2.1.2 Structure of the Curriculum(5)

## Scheme and Syllabi of Courses B.Tech. Year-2019 batch onwards

**1<sup>st</sup>Semester (Group A) Electrical / Electronics & Comm. / Computer Science / Information Technology**

| S. No. | Course Code | Course Title                            | Department Offering    | Credit | Contact Hours |   |    |       |
|--------|-------------|-----------------------------------------|------------------------|--------|---------------|---|----|-------|
|        |             |                                         |                        |        | L             | T | P  | Total |
| 1      | EEL100      | Basic Electrical Engineering            | Electrical             | 4      | 3             | 1 | 0  | 4     |
| 2      | HUL100      | Basic English and Communication Skills  | Humanities             | 3      | 2             | 1 | 0  | 3     |
| 3      | ITL100      | Computer Programming                    | Information Technology | 3      | 2             | 1 | 0  | 3     |
| 4      | CYL100      | Engineering Chemistry                   | Chemistry              | 4      | 3             | 1 | 0  | 4     |
| 5      | CIP100      | Engineering Drawing                     | Civil                  | 4      | 1             | 0 | 6  | 7     |
| 6      | MAL100      | Mathematics I                           | Mathematics            | 4      | 3             | 1 | 0  | 4     |
| 7      | ELP100      | Basic Electrical Engineering Laboratory | Electrical             | 1      | 0             | 0 | 2  | 2     |
| 8      | CYP100      | Chemistry Laboratory                    | Chemistry              | 1      | 0             | 0 | 2  | 2     |
| 9      | ITP100      | Computer Programming Laboratory         | Information Technology | 1      | 0             | 0 | 2  | 2     |
|        |             | <b>Total</b>                            |                        | 25     | 14            | 5 | 12 | 31    |

**1<sup>st</sup>Semester (Group B) Civil/ Mechanical / Chemical / Mett & Mat Science**

| S. No. | Course Code | Course Title                           | Department Offering | Credit | Contact Hours |   |   |       |
|--------|-------------|----------------------------------------|---------------------|--------|---------------|---|---|-------|
|        |             |                                        |                     |        | L             | T | P | Total |
| 1      | MEL100      | Elements of Mechanical Engg.           | Mechanical          | 3      | 2             | 1 | 0 | 3     |
| 2      | PHL100      | Engineering Physics                    | Physics             | 4      | 3             | 1 | 0 | 4     |
| 3      | CIL100      | Engineering Mechanics                  | Civil               | 4      | 3             | 1 | 0 | 4     |
| 4      | HUL100      | Basic English and Communication Skills | Humanities          | 3      | 2             | 1 | 0 | 3     |
| 5      | CYL101      | Environmental Studies                  | Chemistry           | 3      | 2             | 1 | 0 | 3     |
| 6      | MAL100      | Mathematics I                          | Mathematics         | 4      | 3             | 1 | 0 | 4     |
| 7      | HUP100      | Language Laboratory                    | Humanities          | 1      | 0             | 0 | 2 | 2     |
| 8      | PHP100      | Physics Laboratory                     | Physics             | 1      | 0             | 0 | 2 | 2     |
| 9      | WSP100      | Work shop Practice                     | Work shop           | 2      | 0             | 0 | 5 | 5     |
|        |             | <b>Total</b>                           |                     | 25     | 15            | 6 | 9 | 30    |

**2<sup>nd</sup>Semester (Group A) Electrical / Electronics & Comm. / Computer Science / Information Technology**

| S. No. | Course Code | Course Title                                            | Department Offering | Credit | Contact Hours |   |   |       |
|--------|-------------|---------------------------------------------------------|---------------------|--------|---------------|---|---|-------|
|        |             |                                                         |                     |        | L             | T | P | Total |
| 1      | HUL101      | Advanced English Comm. Skills & Organizational Behavior | Humanities          | 3      | 2             | 1 | 0 | 3     |

|   |        |                              |             |    |    |   |   |    |
|---|--------|------------------------------|-------------|----|----|---|---|----|
| 2 | PHL100 | Engineering Physics          | Physics     | 4  | 3  | 1 | 0 | 4  |
| 3 | CIL100 | Engineering Mechanics        | Civil       | 4  | 3  | 1 | 0 | 4  |
| 4 | MEL100 | Elements of Mechanical Engg. | Mechanical  | 3  | 2  | 1 | 0 | 3  |
| 5 | CYL101 | Environmental Studies        | Chemistry   | 3  | 2  | 1 | 0 | 3  |
| 6 | MAL101 | Mathematics II               | Mathematics | 4  | 3  | 1 | 0 | 4  |
| 7 | HUP100 | Language Laboratory          | Humanities  | 1  | 0  | 0 | 2 | 2  |
| 8 | PHP100 | Physics Laboratory           | Physics     | 1  | 0  | 0 | 2 | 2  |
| 9 | WSP100 | Work shop Practice           | Work shop   | 2  | 0  | 0 | 5 | 5  |
|   |        | <b>Total</b>                 |             | 25 | 15 | 6 | 8 | 30 |

**2<sup>nd</sup> Semester (Group B) Civil/ Mechanical / Chemical / Mett & Mat Science**

| S. No. | Course Code | Course Title                                            | Department Offering    | Credit | Contact Hours |   |    |       |
|--------|-------------|---------------------------------------------------------|------------------------|--------|---------------|---|----|-------|
|        |             |                                                         |                        |        | L             | T | P  | Total |
| 1      | HUL101      | Advanced English Comm. Skills & Organizational Behavior | Humanities             | 3      | 2             | 1 | 0  | 3     |
| 2      | EEL100      | Basic Electrical Engineering                            | Electrical             | 4      | 3             | 1 | 0  | 4     |
| 3      | ITL100      | Computer Programming                                    | Information Technology | 3      | 2             | 1 | 0  | 3     |
| 4      | CYL100      | Engineering Chemistry                                   | Chemistry              | 4      | 3             | 1 | 0  | 4     |
| 5      | CIP100      | Engineering Drawing                                     | Civil                  | 4      | 1             | 0 | 6  | 7     |
| 6      | MAL101      | Mathematics II                                          | Mathematics            | 4      | 3             | 1 | 0  | 4     |
| 7      | ELP100      | Basic Electrical Engineering Laboratory                 | Electrical             | 1      | 0             | 0 | 2  | 2     |
| 8      | CYP100      | Chemistry Laboratory                                    | Chemistry              | 1      | 0             | 0 | 2  | 2     |
| 9      | ITP100      | Computer Programming Laboratory                         | Information Technology | 1      | 0             | 0 | 2  | 2     |
|        |             | <b>Total</b>                                            |                        | 25     | 14            | 5 | 12 | 31    |

**3<sup>rd</sup> Semester**

| S. No. | Course Code | Course Title                              | Credits | Contact Hours |   |   |       |
|--------|-------------|-------------------------------------------|---------|---------------|---|---|-------|
|        |             |                                           |         | L             | T | P | Total |
| 1      | EET201      | Electrical Measurement & Instrumentation. | 4       | 3             | 1 | 0 | 4     |
| 2      | ECT201      | Electronics-I                             | 4       | 3             | 1 | 0 | 4     |
| 3      | ECT202      | Network Analysis                          | 4       | 3             | 1 | 0 | 4     |
| 4      | PHT201      | EMF & Waves                               | 4       | 3             | 1 | 0 | 4     |
| 5      | MMT209      | Electrical Engg. Materials                | 4       | 3             | 1 | 0 | 4     |
| 6      | MAT204      | Mathematics-III                           | 4       | 3             | 1 | 0 | 4     |
| 7      | ECL204      | Electronics – I Lab                       | 1       | 0             | 0 | 2 | 2     |
| Total  |             |                                           | 25      | 18            | 6 | 2 | 26    |

**4<sup>th</sup> Semester**

| S. No | Course Code | Course Title          | Credits | Contact Hours |   |   |       |
|-------|-------------|-----------------------|---------|---------------|---|---|-------|
|       |             |                       |         | L             | T | P | Total |
| 1.    | EET250      | Electrical Machines-I | 4       | 3             | 1 | 0 | 4     |

|    |        |                                              |           |           |          |          |           |
|----|--------|----------------------------------------------|-----------|-----------|----------|----------|-----------|
| 2. | EET251 | Control Systems-I                            | 4         | 3         | 1        | 0        | 4         |
| 3. | MET257 | Thermal Engineering                          | 4         | 3         | 1        | 0        | 4         |
| 4. | ECT250 | Electronics-II                               | 4         | 3         | 1        | 0        | 4         |
| 5. | CVT259 | Hydraulics & Hydraulic Machines              | 3         | 2         | 1        | 0        | 3         |
| 6. | MAT253 | Mathematics-IV                               | 3         | 2         | 1        | 0        | 3         |
| 7. | EEL252 | Electrical Machines – I Lab.                 | 1         | 0         | 0        | 2        | 2         |
| 8. | EEL253 | Electrical Measurement & Instrumentation-Lab | 1         | 0         | 0        | 2        | 1         |
| 9. | EEL253 | Electronics-II Lab                           | 1         | 0         | 0        | 2        | 3         |
|    |        | <b>Total</b>                                 | <b>25</b> | <b>16</b> | <b>6</b> | <b>6</b> | <b>28</b> |

### Scheme and Syllabi of Courses B.Tech. Year-2015 batch onwards

| Course Code              | Course Title               | Total Number of contact hours |              |               |             |   | Credits |
|--------------------------|----------------------------|-------------------------------|--------------|---------------|-------------|---|---------|
|                          |                            | Lecture (L)                   | Tutorial (T) | Practical (P) | Total Hours |   |         |
| 1 <sup>st</sup> Semester |                            |                               |              |               |             |   |         |
| PHY-101                  | Physics                    | 3                             | 0            | 0             | 3           | 3 |         |
| PHY-102 P                | Physics(Lab)               | 0                             | 0            | 2             | 2           | 1 |         |
| CHM-101                  | Chemistry                  | 4                             | 0            | 0             | 4           | 4 |         |
| CHM-102 P                | Chemistry(Lab)             | 0                             | 0            | 2             | 2           | 1 |         |
| MTH-101                  | Mathematics                | 3                             | 1            | 0             | 4           | 4 |         |
| HSS-101                  | Humanities                 | 3                             | 1            | 0             | 4           | 4 |         |
| CIV-102                  | Engineering Drawing        | 1                             | 0            | 3             | 4           | 4 |         |
| IT-101                   | Computer Science           | 3                             | 0            | 0             | 3           | 3 |         |
| IT-102 P                 | Computer Science (Lab)     | 0                             | 0            | 2             | 2           | 1 |         |
| WSP-1P                   | Workshop Practice          | 1                             | 0            | 3             | 4           | 2 |         |
| 2 <sup>nd</sup> Semester |                            |                               |              |               |             |   |         |
| PHY-201                  | Physics-II                 | 3                             | 0            | 0             | 3           | 3 |         |
| PHY-201 P                | Physics-II (Lab)           | 0                             | 0            | 2             | 2           | 1 |         |
| CHM-201                  | Chemistry-II               | 3                             | 1            | 0             | 4           | 4 |         |
| CHM-201 P                | Chemistry-II (Lab)         | 0                             | 0            | 2             | 2           | 1 |         |
| MTH-201                  | Mathematics-II             | 3                             | 1            | 0             | 4           | 4 |         |
| HSS-201                  | Humanities-II              | 3                             | 1            | 0             | 4           | 4 |         |
| MED-201                  | Machine Drawing            | 1                             | 0            | 2             | 3           | 3 |         |
| CSE-201                  | Programming                | 3                             | 0            | 0             | 3           | 3 |         |
| CSE-202 P                | Computer Programming (Lab) | 0                             | 0            | 2             | 2           | 1 |         |
| CIV-201                  | Engineering Mechanics      | 3                             | 1            | 0             | 4           | 4 |         |
| WSP-II P                 | Workshop Practice          | 1                             | 0            | 3             | 4           | 2 |         |

| 3 <sup>rd</sup> Semester |                                                                                |   |   |   |   |   |
|--------------------------|--------------------------------------------------------------------------------|---|---|---|---|---|
| ELE-301                  | Basic Electrical Engineering                                                   | 2 | 1 |   | 3 | 3 |
| ELE-301P                 | Basic Electrical Engineering LAB                                               | - | - | 2 |   | 1 |
| ECE-301                  | Network Analysis and Synthesis                                                 | 3 | 1 | 0 | 4 | 4 |
| ECE-302                  | Electronics-I                                                                  | 2 | 1 |   | 3 | 3 |
| ECE-302P                 | Electronics-I LAB                                                              | - | - | 2 |   | 1 |
| PHY-303                  | Electro Magnetic Fields & Waves                                                | 2 | 1 | 0 | 3 | 3 |
| MET-302                  | Electrical Engineering Materials                                               | 2 | 1 | 0 | 3 | 3 |
| MTH-305                  | Mathematics-III                                                                | 2 | 1 | 0 | 3 | 3 |
| MECH-ELE                 | Engineering Thermodynamics                                                     | 3 | 1 | 0 | 4 | 4 |
| ELE-301                  | Principles of Electrical Engineering<br>(For ECE Department)                   | 3 | 1 |   | 4 | 4 |
| ELE-301P                 | Principles of Electrical Engineering LAB(For<br>ECE Department)                |   |   | 2 |   | 1 |
| ELE-302                  | Electrical Engineering Technology<br>(For Civil Engineering Department)        | 2 | 1 |   | 3 | 3 |
| ELE-302P                 | Electrical Engineering Technology LAB (For<br>Civil Engineering Department)    |   |   | 2 |   | 1 |
| ELE-303                  | Electrical Engineering Technology<br>(For Chemical Engineering Department)     | 2 | 1 |   | 3 | 3 |
| ELE-303P                 | Electrical Engineering Technology LAB (For<br>Chemical Engineering Department) |   |   | 2 |   | 1 |
| ELE-304                  | Electrical Engineering Technology<br>(For Metallurgical Engg. Department)      | 2 | 1 |   | 3 | 3 |
| ELE-304P                 | Electrical Engineering Technology LAB(For<br>Metallurgical Engg. Department)   |   |   | 2 |   | 1 |
| ELE-305                  | Basic Electrical Engineering<br>(For Computer Sciences and Engineering)        | 2 | 1 |   | 3 | 3 |
| ELE-305P                 | Basic Electrical Engineering LAB<br>(For Computer Sciences and Engg.)          |   |   | 2 |   | 1 |
| ELE-306                  | Circuit Analysis<br>(For Information Technology)                               | 2 | 1 |   | 3 | 3 |
| ELE-306P                 | Circuit Analysis LAB<br>(For Information Technology)                           |   |   | 2 |   | 1 |
| 4 <sup>th</sup> Semester |                                                                                |   |   |   |   |   |
| ELE-401                  | Electric Machines-I                                                            | 3 | 1 | 0 | 4 | 4 |
| ELE-401P                 | Electric Machines-I Lab                                                        | 0 | 0 | 2 | - | 1 |
| ELE-402                  | Control Systems-I                                                              | 3 | 1 | 0 | 4 | 4 |
| ELE-403                  | Electrical Measurements and Measuring<br>Instruments                           | 3 | 1 | 0 | 4 | 4 |
| ELE-403P                 | Electrical Measurements and Measuring<br>Instruments Lab                       | 0 | 0 | 2 | - | 1 |
| ECE-402                  | Electronics – II                                                               | 3 | 1 | 0 | 4 | 4 |
| ECE-402P                 | Electronics – II Lab.                                                          | 0 | 0 | 2 | - | 1 |

|                          |                                                                                   |   |   |   |   |   |
|--------------------------|-----------------------------------------------------------------------------------|---|---|---|---|---|
| CIV-401                  | Hydraulics and Hydraulic Machines                                                 | 2 | 1 | 0 | 3 | 3 |
| MTH-402                  | Mathematics-IV                                                                    | 2 | 1 | 0 | 3 | 3 |
| ELE-405                  | Electrical Machines<br>(For ECE Department)                                       | 2 | 1 |   | 3 | 3 |
| ELE-406                  | Electrical Engineering Technology (For<br>Electrical Engineering Department)      | 2 | 1 |   | 3 | 3 |
| ELE-406P                 | Electrical Engineering Technology Lab. (For<br>Electrical Engineering Department) | 0 | 0 | 2 |   | 1 |
| ELE-407                  | Control Systems<br>(For ECE Department)                                           | 2 | 1 |   | 3 | 3 |
| ELE-407P                 | Control Systems Lab.<br>(For ECE Department)                                      | 0 | 0 | 2 |   | 1 |
| ELE-408                  | Control Systems<br>(For Information Technology)                                   | 2 | 1 |   | 3 | 3 |
| ELE-408                  | Control Systems<br>(For CSE)                                                      | 2 | 1 |   | 3 | 3 |
| 5 <sup>th</sup> Semester |                                                                                   |   |   |   |   |   |
| ELE-501                  | Power Systems – I                                                                 | 2 | 1 | 0 | 3 | 3 |
| ELE-501P                 | Power Systems - I Lab.                                                            | 0 | 0 | 2 | - | 1 |
| ELE-502                  | Electric Machines-II                                                              | 3 | 1 | 0 | 4 | 4 |
| ELE-502P                 | Electric Machines-II Lab.                                                         | 0 | 0 | 2 | - | 1 |
| ELE-503                  | Control System-II                                                                 | 2 | 1 | 0 | 3 | 3 |
| ELE-503P                 | Control System & VI Lab.                                                          | 0 | 0 | 2 | - | 1 |
| ELE-504P                 | Computer Aided Simulation of Electrical<br>Systems                                | 0 | 0 | 3 | - | 2 |
| ECE-508                  | Communication Systems                                                             | 2 | 1 | 0 | 3 | 3 |
| ECE-509                  | Digital Electronics & Logic Design                                                | 2 | 1 | 0 | 3 | 3 |
| ECE-509P                 | Digital Electronics & Logic Design Lab.                                           | 0 | 0 | 2 | - | 1 |
| MTH-503                  | Mathematics-V                                                                     | 2 | 1 | 0 | 3 | 3 |
| 6 <sup>th</sup> Semester |                                                                                   |   |   |   |   |   |
| ELE-601                  | Power Systems-II                                                                  | 3 | 1 | 0 | 4 | 4 |
| ELE-601P                 | Power Systems-II LAB                                                              | 0 | 0 | 2 | - | 1 |
| ELE-602                  | Power Electronics                                                                 | 3 | 1 | 0 | 4 | 4 |
| ELE-602P                 | Power Electronics LAB                                                             | 0 | 0 | 2 | - | 1 |
| ELE-603                  | Electric Machines Design                                                          | 3 | 1 | 0 | 4 | 4 |
| ELE-604                  | Tour & Training                                                                   | 0 | 0 | 0 | 2 | 2 |
| ELE-605                  | Digital Signal Processing                                                         | 3 | 1 | 0 | 4 | 4 |
| ELE-606                  | Microprocessors                                                                   | 3 | 1 | 0 | 4 | 4 |
| ELE-606P                 | Microprocessors LAB                                                               | 0 | 0 | 2 | - | 1 |
| ELE-607                  | Power Electronics<br>(For ECE Department)                                         | 2 | 1 |   | 3 | 3 |
| ELE-607P                 | Power Electronics Lab.<br>(For ECE Department)                                    | 0 | 0 | 2 |   | 1 |
| 7 <sup>th</sup> Semester |                                                                                   |   |   |   |   |   |

|                          |                                                       |     |   |    |    |    |
|--------------------------|-------------------------------------------------------|-----|---|----|----|----|
| ELE-701                  | Power System Protection                               | 2   | 1 |    | 3  | 3  |
| ELE-701 P                | Power System Protection LAB.                          |     |   | 2  |    | 1  |
| ELE-702                  | Advanced Power Electronics                            | 3   | 1 | 0  | 4  | 4  |
| ELE-703                  | Power Systems-III                                     | 3   | 1 | 0  | 4  | 4  |
| ECE-708                  | Electronic Measurements & Instrumentation             | 2   | 1 |    | 3  | 3  |
| ECE-708P                 | Electronic Measurements & Instrumentation LAB         |     |   | 2  |    | 1  |
| ELE-704                  | Power Station Practice                                | 2   | 1 | 0  | 3  | 3  |
| ELE-1-14                 | Elective                                              | 2   | 1 | 0  | 3  | 3  |
| ELE-706P                 | Project Preliminary Work/ Seminar                     | 0   | 0 | 3  |    | 3  |
| ELE-705                  | Electrical Power Systems<br>(For ECE Department)      | 2   | 1 |    | 3  | 3  |
| ELE-705P                 | Electrical Power Systems Lab.<br>(For ECE Department) | 0   | 0 | 2  |    | 1  |
| 8 <sup>th</sup> Semester |                                                       |     |   |    |    |    |
| HSS-701                  | General Management & Economics                        | 2   | 1 | 0  | 4  | 03 |
| ELE-1-14 /<br>MTH-705    | Elective-I                                            | 2   | 1 | 0  | 3  | 03 |
| ELE-803                  | High Voltage Engineering                              | 2   | 1 | 0  | 3  | 03 |
| ELE-803P                 | High Voltage Engineering Lab.                         | 0   | 0 | 2  | 0  | 01 |
| ELE-802                  | Project                                               | 0   | 0 | 18 | 12 | 12 |
| ELE-1-14                 | Elective-II                                           | 2   | 1 | 0  | 3  | 03 |
| Total                    |                                                       | 207 |   |    |    |    |

**Department Elective Subject for 7<sup>th</sup> & 8<sup>th</sup> Semesters (Electrical)**

**BATCH 2015 ONWARDS**

**Electives –I, II, III (3 credits each)**

- |                                                    |         |
|----------------------------------------------------|---------|
| 1. Distribution System Automation                  | ELE-1/E |
| 2. Industrial Process Instrumentation & Telemetry  | ELE-2/E |
| 3. Selected Topics in Advanced Control             | ELE-3/E |
| 4. Mechatronics                                    | ELE-4/E |
| 5. Advanced Power Systems Control                  | ELE-5/E |
| 6. Power Systems Transients                        | ELE-6/E |
| 7. System Planning & Load Forecasting              | ELE-7/E |
| 8. EHV AC & DC Transmission                        | ELE-8/E |
| 9. Maintenance & Design of Electrical Sub Stations | ELE-9/E |

|                                                |          |
|------------------------------------------------|----------|
| 10. Power System Reliability                   | ELE-10/E |
| 11. Utilization & Traction                     | ELE-11/E |
| 12. Microcontroller & their Applications + LAB | ELE-12/E |
| 13. Electric Drives + LAB                      | ELE-13/E |
| 14. Renewable Sources of Electrical Energy     | ELE-14/E |
| 15. Optimization Techniques                    | MTH-705  |

### 2.1.3 State the components of the curriculum (5)

Programme curriculum grouping based on different components

| Course Component                  | Curriculum Content<br>(% of Total Number<br>of Credits of the<br>program) | Total number of<br>Contact hours | Total number of<br>credits |
|-----------------------------------|---------------------------------------------------------------------------|----------------------------------|----------------------------|
| Basic Sciences                    | 8.212                                                                     | 17                               | 17                         |
| Engineering<br>Sciences           | 15.45                                                                     | 34                               | 32                         |
| Humanities and<br>Social Sciences | 14.00                                                                     | 33                               | 29                         |
| Program Core                      | 47.82%                                                                    | 114                              | 99                         |
| Program Electives                 | 4.347%                                                                    | 9                                | 9                          |
| Open Electives                    | 1.93%                                                                     | 8                                | 4                          |
| Project/<br>Internships/Seminars  | 8.212%                                                                    | 15                               | 17                         |
| <b>Total number of credits</b>    |                                                                           |                                  | <b>207</b>                 |

### 2.1.4. State the process used to identify the extent of compliance of the curriculum for attaining the Program Outcome (POs) and Program Specific Outcomes (PSOs) (10):

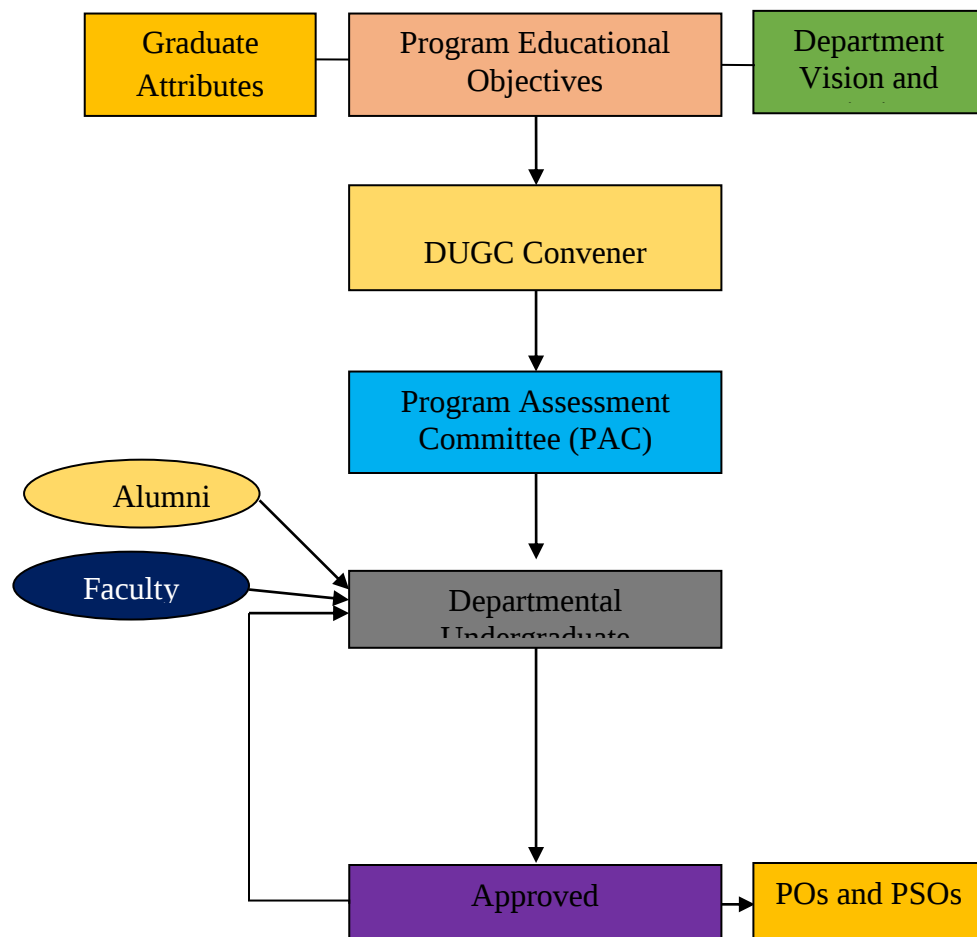
Different methods / processes used to identify the extent of compliance of the curriculum for attaining the program outcomes and Program Specific Outcomes Based on the POs mentioned in SAR of NBA, subjects are segregated and mapped with POs.

Each Course has well defined course outcomes and they correlate to POs and PSOs leading to eventual attainment. This strong correlation among the COs and POs, develops the necessary skills in students, and transforms them as proficient engineers.

#### Process to identify the extent of compliance of curriculum for attainment of POs & PSOs

- POs & PSOs stated clearly.

- Department curriculum is stated subject wise and the percentage of total credits for each subject is evaluated.
- The total number of contact hours for each subject in a semester is calculated.
- Course allocation to the faculty takes place two months prior to the commencement of classes as per the faculty preference such as to prepare their pedagogical approach for the subject.
- Faculty incharge of the course prepares detailed lecture plans according to the academic calendar of the Institution, and maintains a course file comprising of all the lesson plans. The lecture plans incorporate the details of the topics to be covered in each lecture, syllabus to be covered before internal exams, number of tutorials to be conducted and, total number of lecture hours necessary for completion of the course.
- The Program Assessment Committee considers the defined mandatory graduate attributes (GAs) from the NBA guidelines, Program Educational Objectives, Vision and Mission statements of the Department and views from the stakeholders. The committee develops POs & PSOs and discusses with the senior faculty members of the Department. The developed POs & PSOs are put up in DUGC (earlier Board of Studies) meeting for review and approval. Process of defining POs and PSOs is depicted in the flowchart as shown in Figure B.2.1.4a.



**Figure: Procedure for Defining Program Outcomes and Program Specific Outcomes**

**The PO and PSO articulation matrix is as follows:**

**Year (2017-18)**

| Course                                            | PO1  | PO2  | PO3  | PO4       | PO5  | PO6  | PO7       | PO8  | PO9  | PO10      | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------------------------------------------|------|------|------|-----------|------|------|-----------|------|------|-----------|------|------|------|------|------|
| Chemistry I                                       | 1.92 | 1.78 | 1.28 | 0.2       | 1.6  | 1.14 | 1.68      | 0.4  | 1    | 1.56      | 1.72 | 1.34 | 2.14 | 2.02 | 1.48 |
| Chemistry Lab-I                                   | 2.32 | 1.52 | 0.2  | 0.2       | 2.32 | 1.92 | 2.32      | 0.4  | 0.6  | 1.38      | 2.12 | 1.32 | 2.52 | 2.52 | 1.66 |
| Chemistry II                                      | 2.11 | 1.73 | 1.94 | 1.19      | 1.38 | 1.12 | 2.25      | 1.2  | 1.22 | 1.99      | 0.44 | 1.78 | 1.91 | 2.16 | 1.35 |
| Chemistry Lab-II                                  | 2.32 | 1.92 | 1.74 | 0.42      | 0.42 | 1.72 | 1.93      | 0.43 | 0.45 | 1.56      | 1.38 | 1.4  | 2.13 | 2.33 | 1.92 |
| Mathematics I                                     | 1.33 | 1.49 | 1.36 | 1.34      | 1.4  | 1    | 0.6       | 0.4  | 0.6  | 0.4       | 0.6  | 0.4  | 1.56 | 1.73 | 0.97 |
| Mathematic II                                     | 1.5  | 1.25 | 1.36 | 0.92      | 0.85 | 0.4  | 0.6       | 0.4  | 0.6  | 0.4       | 0.6  | 0.4  | 1.29 | 1.44 | 0.77 |
| Basic Electrical Engineering                      | 2.8  | 1.8  | 1.6  | 2.4       | 1.8  | 1.4  | 0         | 0    | 0    | 0         | 2.2  | 1.4  | 2    | 2    | 2.2  |
| Basic Electrical Engineering lab                  | 2.26 | 2.22 | 0.43 | 1.8       | 1.42 | 2.4  | 2.03      | 0.43 | 0.45 | 0.44      | 2.24 | 0.47 | 2.05 | 2.26 | 1.23 |
| Electronics I                                     | 1.9  | 1.6  | 1.8  | 1.6       | 0    | 0.8  | 1.3       | 0    | 0    | 0         | 0    | 2.2  | 2.2  | 2.2  | 1.8  |
| Network Analysis and Synthesis                    | 3    | 3    | 3    | 3         | 3    | 3    | 3         | 3    | 3    | 3         | 3    | 3    | 3    | 3    | 3    |
| Mathematics III                                   | 1.23 | 1.23 | 0    | 0.87      | 0    | 1.64 | 0.96      | 0    | 0    | 0         | 1.64 | 0    | 1.34 | 1.47 | 0.55 |
| Electrical engineering materials                  | 2.1  | 1.96 | 1.78 | 1.11      | 1.21 | 1.87 | 0.88      | 0    | 0    | 0         | 1.11 | 1.64 | 2.39 | 2.07 | 1.96 |
| Electric Machines-I                               | 1.39 | 1.37 | 0.41 | 1.08      | 0.4  | 1.75 | 1.18      | 0.42 | 0.44 | 0.43      | 1.37 | 0.44 | 1.27 | 1.38 | 0.83 |
| Electric machines I lab                           | 2.24 | 2.21 | 0.41 | 1.8       | 0.4  | 2.41 | 2.03      | 0.42 | 0.44 | 0.43      | 2.22 | 0.45 | 2.02 | 2.23 | 1.21 |
| Mathematics IV                                    | 1.23 | 1.23 | 0    | 0.87      | 0    | 1.64 | 0.96      | 0    | 0    | 0         | 1.64 | 0    | 1.34 | 1.47 | 0.55 |
| Control Systems-I                                 | 2.36 | 2.22 | 2.36 | 2.02      | 2.01 | 1.03 | 2.09      | 0.99 | 2.02 | 1.36      | 1.39 | 1.45 | 1.58 | 1.73 | 0.79 |
| Power Systems-I                                   | 2.13 | 1.61 | 1.61 | 1.04      | 2.09 | 1.89 | 0         | 0    | 0    | 0         | 2.1  | 1.68 | 1.7  | 2.11 | 1.09 |
| Power Systems-I lab                               | 2    | 2.4  | 2    | 1.4       | 0.8  | 1.6  | 2.2       | 1.2  | 0.6  | 0.4       | 1    | 1    | 2.4  | 2.6  | 2    |
| Electrical Measurements and Measuring Instruments | 2.25 | 2.25 | 2    | 1.83      | 0.83 | 2.25 | 2         | 0    | 0    | 0         | 2.25 | 1.67 | 1.67 | 2.25 | 0.83 |
| Control System-II                                 | 2.94 | 2.79 | 2.36 | 2.33<br>5 | 2.36 | 1.92 | 2.03      | 0.73 | 1.82 | 1.39      | 1    | 2.49 | 2.08 | 2.4  | 1.25 |
| Control system II lab                             | 2.48 | 2.48 | 2.22 | 1.1       | 1.39 | 0.26 | 0.83      | 0.54 | 2.48 | 2.22      | 2.22 | 1.94 | 2.22 | 2.22 | 0.83 |
| Electric Machines-II                              | 2.1  | 1.2  | 1.3  | 1.25      | 2.5  | 2    | 2.22      | 1.25 | 0.85 | 1.24      | 1.45 | 1.02 | 2.12 | 2.3  | 2.01 |
| Electric machines II lab                          | 1.89 | 2.84 | 1.89 | 0.94      | 0    | 2.84 | 1.89      | 1.86 | 1.26 | 2.21      | 1.26 | 2.21 | 1.89 | 1.89 | 2.21 |
| Mathematics V                                     | 1.23 | 1.23 | 0    | 0.87      | 0    | 1.64 | 0.96      | 0    | 0    | 0         | 1.64 | 0    | 1.34 | 1.47 | 0.55 |
| Computer aided simulation lab                     | 2.81 | 2.48 | 2.19 | 1.88      | 1.91 | 1.59 | 1.3       | 0.98 | 1.82 | 1.91      | 0.65 | 2.19 | 1.27 | 1.54 | 1.26 |
| Power Systems-II                                  | 2.3  | 2.19 | 0.98 | 1.62      | 1.37 | 0    | 0         | 0    | 0    | 0         | 1.83 | 0.64 | 1.36 | 1.48 | 0.82 |
| Power Electronics                                 | 1.62 | 1.36 | 1.7  | 1.16      | 0.73 | 1.16 | 0         | 0    | 1.88 | 1.98      | 0    | 1.34 | 1.78 | 1.26 | 1.54 |
| Power Electronics Lab                             | 1.4  | 1.2  | 1.3  | 1         | 0.6  | 1    | 0.4       | 0.4  | 1.4  | 1.5       | 0.4  | 1.1  | 1.3  | 1.1  | 1.2  |
| Digital Signal Processing                         | 2.8  | 1.8  | 1.6  | 2.4       | 1.8  | 1.4  | 0         | 0    | 0    | 0         | 2.2  | 1.4  | 2    | 2    | 2.2  |
| Microprocessors                                   | 2.25 | 1.63 | 1.84 | 2.05      | 1.84 | 1.22 | 1.21<br>6 | 0.4  | 0.6  | 1.01<br>6 | 1.62 | 1.42 | 2.24 | 2.24 | 2.04 |
| Microprocessors lab                               | 2.8  | 1.73 | 1.73 | 2.06      | 2.8  | 1.2  | 0.6       | 0.4  | 0.6  | 1.2       | 2.2  | 1.2  | 3    | 3    | 2.52 |
| Tour and Training                                 | 1.87 | 1.38 | 3    | 2.2       | 2.35 | 1.4  | 1.9       | 0.9  | 3    | 3         | 2.2  | 0.9  | 1.9  | 1.9  | 2.23 |

|                                                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Electric Machines Design                        | 1.28 | 1.31 | 1.25 | 1.4  | 1.13 | 0.41 | 0.43 | 0.42 | 0.45 | 0.43 | 1.04 | 0.88 | 1.04 | 1.06 | 0.84 |
| Power System Protection                         | 2.13 | 2.08 | 1.72 | 1.47 | 1.02 | 1.89 | 1.63 | 0.2  | 0.4  | 0.4  | 1.89 | 1.53 | 1.53 | 1.69 | 1.02 |
| Power system Protection Lab                     | 2.88 | 2.12 | 0.4  | 1.96 | 0.4  | 2.68 | 2.16 | 0.2  | 0.4  | 0.4  | 1.92 | 0.4  | 1.92 | 2.52 | 1.16 |
| Advanced Power Electronics                      | 2.28 | 2.28 | 1.64 | 0.2  | 0.3  | 0.1  | 0.6  | 0    | 0    | 0    | 0.6  | 1.4  | 2.2  | 1.4  | 0.7  |
| Selected topics in advanced control             | 1.93 | 2.14 | 1.4  | 1.87 | 0.35 | 1.81 | 1.25 | 0.81 | 1.31 | 1.11 | 2.33 | 2.4  | 0.88 | 2.14 | 2.07 |
| Power Systems-III                               | 1.65 | 1.98 | 1.83 | 1.5  | 0.81 | 1.83 | 1.68 | 0    | 0    | 0    | 1.83 | 1.32 | 1.32 | 1.83 | 0.81 |
| Power Station Practice                          | 2.13 | 1.98 | 1.6  | 1.4  | 1.48 | 0.43 | 0.44 | 0.44 | 0.46 | 0.43 | 1.63 | 1.05 | 1.31 | 1.35 | 1.02 |
| Utilisation and traction                        | 2.06 | 0.78 | 1.56 | 0.78 | 0.86 | 1.33 | 0.43 | 0.88 | 0.45 | 0.43 | 1.26 | 1.7  | 1.68 | 1.83 | 1.56 |
| Maintenance and design of electrical substation | 2.4  | 2.6  | 2    | 1.6  | 2    | 1.75 | 0    | 0    | 2    | 0    | 2.25 | 2.2  | 1.6  | 2    | 2.2  |
| Project                                         | 1.2  | 1.17 | 1.03 | 1.48 | 1.47 | 0.42 | 0.59 | 0.88 | 0.75 | 0.59 | 0.74 | 0.47 | 1.66 | 1.67 | 1.64 |
| Renewable sources of electrical energy          | 1.48 | 1.81 | 1.48 | 1.15 | 0.38 | 1.1  | 1.45 | 0.73 | 0    | 0    | 0.39 | 0.54 | 1.64 | 1.81 | 1.48 |
| High Voltage Engineering                        | 2    | 1.3  | 1.3  | 0.6  | 1.3  | 0.6  | 0.25 | 0    | 0    | 0    | 0    | 1.3  | 2    | 2    | 0.6  |
| High voltage engineering lab                    | 1.7  | 1    | 1    | 0.56 | 1    | 0.56 | 0.48 | 0    | 0    | 0    | 0    | 1    | 1.7  | 1.7  | 0.56 |

**Year (2018-19)**

| Course                                            | PO1  | PO2  | PO3   | PO4  | PO5  | PO6  | PO7  | PO8  | PO9   | PO10  | PO11 | PO12  | PSO1  | PSO2  | PSO3  |
|---------------------------------------------------|------|------|-------|------|------|------|------|------|-------|-------|------|-------|-------|-------|-------|
| Chemistry I                                       | 2.33 | 1.92 | 1.74  | 0.42 | 0.42 | 1.73 | 1.94 | 0.43 | 0.45  | 1.56  | 1.38 | 1.4   | 2.13  | 2.33  | 1.92  |
| Chemistry Lab I                                   | 2.11 | 1.73 | 1.94  | 1.19 | 1.38 | 1.12 | 2.25 | 1.2  | 1.22  | 1.99  | 0.44 | 1.78  | 1.91  | 2.16  | 1.35  |
| Chemistry II                                      | 1.99 | 1.66 | 1.85  | 1.11 | 1.29 | 1.12 | 2.12 | 1.13 | 1.15  | 1.98  | 0.42 | 1.69  | 1.82  | 2.04  | 1.3   |
| Chemistry Lab II                                  | 2.33 | 1.92 | 1.72  | 0.4  | 0.4  | 1.73 | 1.94 | 0.42 | 0.44  | 1.55  | 1.43 | 1.39  | 2.12  | 2.32  | 1.92  |
| Mathematics I                                     | 1.51 | 1.75 | 1.6   | 1.58 | 1.63 | 1.11 | 0.6  | 0.4  | 0.6   | 0.4   | 0.6  | 0.4   | 1.71  | 1.9   | 1.07  |
| Mathematics II                                    | 1.92 | 1.6  | 1.72  | 1.18 | 1    | 0.4  | 0.6  | 0.4  | 0.6   | 0.4   | 0.6  | 0.4   | 1.52  | 1.65  | 0.91  |
| Humanities                                        | 2.75 | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0     | 0     | 0    | 0     | 2.07  | 2.27  | 2.09  |
| Basic Electrical Engineering                      | 2.8  | 1.8  | 1.6   | 2.4  | 1.8  | 1.4  | 0    | 0    | 0     | 0     | 2.2  | 1.4   | 2     | 2     | 2.2   |
| Basic Electrical Engineering lab                  | 2.24 | 2.22 | 0.41  | 1.8  | 0.4  | 2.4  | 2.03 | 0.42 | 0.44  | 0.44  | 2.22 | 0.45  | 2.03  | 2.23  | 1.23  |
| Mathematics III                                   | 1.23 | 1.23 | 0     | 0.87 | 0    | 1.64 | 0.96 | 0    | 0     | 0     | 1.64 | 0     | 1.34  | 1.47  | 0.55  |
| Network Analysis and Synthesis                    | 3    | 3    | 3     | 3    | 3    | 3    | 3    | 3    | 3     | 3     | 3    | 3     | 3     | 3     | 3     |
| Electric Machines-I                               | 1.23 | 1.23 | 0     | 0.87 | 0    | 1.64 | 0.96 | 0    | 0     | 0     | 1.64 | 0     | 1.34  | 1.47  | 0.55  |
| Electric Machines-I lab                           | 2.24 | 2.21 | 0.4   | 1.78 | 0.38 | 2.41 | 2.01 | 0.41 | 0.42  | 0.43  | 2.21 | 0.44  | 2     | 2.2   | 1.2   |
| Control Systems-I                                 | 1.86 | 1.78 | 1.86  | 1.46 | 1.63 | 0.99 | 1.74 | 0.72 | 1.48  | 1.19  | 1.13 | 1.08  | 1.25  | 1.38  | 0.82  |
| Mathematics IV                                    | 1.23 | 1.23 | 0     | 0.87 | 0    | 1.64 | 0.96 | 0    | 0     | 0     | 1.64 | 0     | 1.34  | 1.47  | 0.55  |
| Power Systems-I                                   | 1.62 | 1.53 | 1.38  | 1.17 | 0.81 | 1.52 | 1.41 | 0    | 0     | 0     | 0.27 | 0.208 | 0.028 | 0.078 | 0.104 |
| Power Systems-I lab                               | 2    | 2.4  | 2     | 1.4  | 0.8  | 1.6  | 2.2  | 1.2  | 0.6   | 0.4   | 1    | 1     | 2.4   | 2.6   | 2     |
| Electrical Measurements and Measuring Instruments | 2.25 | 2.25 | 2     | 1.83 | 0.83 | 2.25 | 2    | 0    | 0     | 0     | 2.25 | 1.67  | 1.67  | 2.25  | 0.83  |
| Electrical measurements Lab                       | 1    | 1    | 1     | 1    | 1    | 1    | 1    | 1    | 1     | 1     | 1    | 1     | 1     | 1     | 1     |
| Control System-II                                 | 1.71 | 1.48 | 1.413 | 1.4  | 1.4  | 1.28 | 0.75 | 0.58 | 1.027 | 0.913 | 0.71 | 1.5   | 1.27  | 1.41  | 0.87  |

|                                                 |           |      |      |           |           |      |           |           |           |      |      |      |      |      |      |
|-------------------------------------------------|-----------|------|------|-----------|-----------|------|-----------|-----------|-----------|------|------|------|------|------|------|
| Control system II lab                           | 2.62      | 2.07 | 2.06 | 1.68      | 1.74      | 1.43 | 1.17      | 0.8       | 1.82      | 1.74 | 0.55 | 1.24 | 1.11 | 1.5  | 1.18 |
| Electric Machines-II                            | 1.39<br>6 | 1.37 | 0.41 | 1.08<br>6 | 0.40<br>2 | 1.75 | 1.18<br>6 | 0.42<br>2 | 0.42<br>2 | 0.43 | 1.37 | 0.44 | 1.27 | 1.38 | 0.83 |
| Power Systems-II                                | 1.64      | 1.49 | 0.87 | 1.23      | 1.12      | 0.41 | 0.43      | 0.42      | 0.44      | 0.44 | 0.76 | 0.91 | 1.6  | 1.61 | 0.41 |
| Power Electronics                               | 1.62      | 1.36 | 1.7  | 1.16      | 0.73      | 1.16 | 0         | 0         | 1.88      | 1.98 | 0    | 1.34 | 1.78 | 1.26 | 1.54 |
| Power Electronics lab                           | 2.25      | 2    | 2.25 | 1.5       | 1         | 1.5  | 0         | 0         | 2.5       | 2.75 | 0    | 1.75 | 2.25 | 1.5  | 2    |
| Computer aided simulation lab                   | 2.79      | 2.47 | 2.18 | 1.82      | 1.86      | 1.54 | 1.25      | 0.89      | 1.9       | 1.86 | 0.61 | 2.18 | 1.21 | 1.58 | 1.25 |
| Digital Signal Processing                       | 2.8       | 1.8  | 1.6  | 2.4       | 1.8       | 1.4  | 0         | 0         | 0         | 0    | 2.2  | 1.4  | 2    | 2    | 2.2  |
| Microprocessors                                 | 2.44      | 1.29 | 2.16 | 1.74      | 1.09      | 1.29 | 0.65      | 0.41      | 0.66      | 1.55 | 1.45 | 2.2  | 2.18 | 2.19 | 2.09 |
| Microprocessors lab                             | 2.08      | 1.73 | 1.73 | 2.06<br>4 | 2.8       | 1.2  | 0.6       | 0.4       | 0.6       | 1.2  | 2.2  | 1.2  | 3    | 3    | 2.52 |
| Tour and Training                               | 2.7       | 1.92 | 1.41 | 0.9       | 2.15      | 0.41 | 0.93      | 0.42      | 0.69      | 1.18 | 1.42 | 1.7  | 1.93 | 1.93 | 0.41 |
| Electric Machines Design                        | 1.78      | 1.55 | 1.37 | 1.15      | 0.89      | 0.41 | 0.43      | 0.42      | 0.72      | 0.43 | 0.42 | 0.76 | 1.39 | 1.4  | 0.9  |
| Power System Protection                         | 2.14      | 1.85 | 1.65 | 1.33      | 0.77      | 1.85 | 1.78      | 0         | 0         | 0    | 1.85 | 1.41 | 1.41 | 1.61 | 0.77 |
| Power system Protection Lab                     | 2.68      | 2.68 | 2.28 | 1.92      | 1.16      | 2.48 | 2.08      | 0.2       | 0.4       | 0.4  | 2.48 | 1.92 | 2    | 2.48 | 1.96 |
| Advanced Power Electronics                      | 2.2       | 2.2  | 1.6  | 0.2       | 0.3       | 0.1  | 0.6       | 0         | 0         | 0    | 0.6  | 1.4  | 2.2  | 1.4  | 0.7  |
| Power Systems-III                               | 1.95      | 1.96 | 2.14 | 1.43      | 0.71      | 2.14 | 0         | 0         | 0         | 0    | 2.1  | 1.4  | 1.43 | 1.98 | 0.71 |
| Power Station Practice                          | 1.88      | 1.54 | 1.63 | 1.39      | 0.91      | 1.81 | 1.67      | 0.42      | 0.44      | 0.44 | 1.81 | 1.48 | 1.46 | 1.82 | 93   |
| Selected topics in advanced control             | 2.23      | 2.14 | 1.4  | 1.87      | 0.35      | 1.8  | 1.46      | 0.81      | 1.31      | 1.11 | 0.59 | 2.4  | 1.88 | 2.14 | 2.07 |
| Utilisation and traction                        | 2.14      | 1.94 | 1.75 | 1.75      | 1.55      | 2.34 | 2.54      | 1.55      | 0.6       | 0.4  | 1.89 | 1.76 | 1.95 | 2.15 | 1.75 |
| Maintenance and design of electrical substation | 2.4       | 2.6  | 2    | 1.6       | 2         | 1.75 | 0         | 0         | 2         | 0    | 2.25 | 2.2  | 1.6  | 2    | 2.2  |
| Project                                         | 1.2       | 1.17 | 1.02 | 1.47      | 1.47      | 0.41 | 0.59      | 0.89      | 0.75      | 0.6  | 0.73 | 0.45 | 1.65 | 1.66 | 1.64 |
| Renewable sources of electrical energy          | 1.63      | 1.87 | 1.59 | 1.32      | 0.71      | 1.29 | 1.59      | 1.01      | 0.44      | 0.44 | 0.73 | 0.88 | 1.74 | 1.88 | 1.6  |
| High Voltage Engineering                        | 2.12      | 1.6  | 1.2  | 1.2       | 1.4       | 0.72 | 0.4       | 0.4       | 0.6       | 0.6  | 0.2  | 1.6  | 2.12 | 1.92 | 1.12 |

**Year 2019-20**

|                                  |      |      |      |      |      |           |           |           |      |           |           |      |      |      |      |
|----------------------------------|------|------|------|------|------|-----------|-----------|-----------|------|-----------|-----------|------|------|------|------|
| Course                           | PO1  | PO2  | PO3  | PO4  | PO5  | PO6       | PO7       | PO8       | PO9  | PO10      | PO11      | PO12 | PSO1 | PSO2 | PSO3 |
| Engineering Chemistry            | 2.33 | 1.92 | 1.72 | 0.4  | 0.4  | 1.73      | 1.94      | 0.42      | 0.44 | 1.55      | 1.43      | 1.39 | 2.12 | 2.32 | 1.92 |
| Engineering Chemistry lab        | 1.99 | 1.66 | 1.85 | 1.11 | 1.29 | 1.12<br>6 | 2.12<br>2 | 1.13      | 1.15 | 1.98      | 0.42<br>2 | 1.69 | 1.82 | 2.04 | 1.3  |
| Basic Electrical Engineering     | 2.8  | 1.8  | 1.6  | 2.4  | 1.8  | 1.4       | 0         | 0         | 0    | 0         | 2.2       | 1.4  | 2    | 2    | 2.2  |
| Basic Electrical Engineering lab | 2.24 | 2.22 | 0.4  | 1.8  | 0.39 | 2.41<br>2 | 2.02      | 0.41<br>2 | 2.02 | 0.41<br>2 | 0.42<br>4 | 0.44 | 2    | 2.2  | 1    |
| Electronics I                    | 1.9  | 1.6  | 1.8  | 1.6  | 0    | 0.8       | 1.3       | 0         | 0    | 0         | 0         | 2.2  | 2.2  | 2.2  | 1.8  |
| Thermal engineering              | 2.4  | 1.8  | 1.8  | 0    | 1.7  | 1.6       | 1.4       | 1.6       | 0    | 0         | 2.1       | 1.6  | 2.4  | 1.4  | 2.4  |
| Network Analysis and Synthesis   | 2    | 2.2  | 1.5  | 2.5  | 2.2  | 2         | 2.5       | 2         | 1.5  | 0.8       | 1.2       | 1.5  | 1.2  | 1.5  | 2.2  |
| Mathematics III                  | 1.23 | 1.23 | 0    | 0.87 | 0    | 1.64      | 0.96      | 0         | 0    | 0         | 1.64      | 0    | 1.34 | 1.47 | 0.55 |
| Electrical engineering materials | 2.1  | 1.96 | 1.78 | 1.11 | 1.21 | 1.87      | 0.88      | 0         | 0    | 0         | 1.11      | 1.64 | 2.39 | 2.07 | 1.96 |
| Electric Machines-I              | 2.21 | 2.08 | 2.01 | 1.9  | 1.93 | 2.06      | 2.09      | 2.06      | 2.12 | 2.19      | 2.08      | 2.2  | 2.02 | 2.02 | 2.02 |
| Electric machines I lab          | 2.21 | 2.08 | 2.01 | 1.9  | 1.93 | 2.06      | 2.09      | 2.06      | 2.12 | 2.19      | 2.08      | 2.2  | 2.02 | 2.02 | 2.02 |
| Mathematics IV                   | 1.23 | 1.23 | 0    | 0.87 | 0    | 1.64      | 0.96      | 0         | 0    | 0         | 1.64      | 0    | 1.34 | 1.47 | 0.55 |

|                                                   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|---------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Control Systems-I                                 | 1.93 | 1.84 | 1.9  | 1.57 | 1.71 | 1.21 | 1.83 | 1    | 1.62 | 1.38 | 1.32 | 1.32 | 1.42 | 1.54 | 1.06 |
| Power Systems-I                                   | 1.32 | 1.55 | 1.29 | 0.96 | 0.61 | 0.87 | 1.27 | 0.42 | 0.44 | 0.44 | 0.5  | 1.37 | 1.37 | 1.55 | 1.28 |
| Power Systems_I lab                               | 2.21 | 2.08 | 2.01 | 1.9  | 1.93 | 2.06 | 2.09 | 2.06 | 2.12 | 2.19 | 2.08 | 2.2  | 2.02 | 2.02 | 2.02 |
| Electrical Measurements and Measuring Instruments | 2.25 | 2.25 | 2    | 1.83 | 0.83 | 2.25 | 2    | 0    | 0    | 0    | 2.25 | 1.67 | 1.67 | 2.25 | 0.83 |
| Control System-II                                 | 1.93 | 1.84 | 1.89 | 1.57 | 1.71 | 1.21 | 1.83 | 1    | 1.62 | 1.38 | 1.32 | 1.31 | 1.42 | 1.54 | 1.06 |
| Control system II lab                             | 2.45 | 2.45 | 2.21 | 1.13 | 1.39 | 0.24 | 0.82 | 0.56 | 2.45 | 2.21 | 2.21 | 1.89 | 2.21 | 2.21 | 0.82 |
| Electric Machines-II                              | 2.8  | 2.26 | 2.06 | 1.13 | 1.46 | 0.93 | 0.2  | 0    | 0    | 0    | 0    | 1.86 | 2.8  | 2.8  | 0.93 |
| Electric machines II lab                          | 1.89 | 2.84 | 1.89 | 0.94 | 0    | 2.84 | 1.89 | 1.86 | 1.26 | 2.21 | 1.26 | 2.21 | 1.89 | 1.89 | 2.21 |
| Mathematics V                                     | 1.23 | 1.23 | 0    | 0.87 | 0    | 1.64 | 0.96 | 0    | 0    | 0    | 1.64 | 0    | 1.34 | 1.47 | 0.55 |
| Computer aided simulation lab                     | 2.81 | 2.48 | 2.19 | 1.88 | 1.91 | 1.59 | 1.3  | 0.98 | 1.82 | 1.91 | 0.65 | 2.19 | 1.27 | 1.54 | 1.26 |
| Power Systems-II                                  | 2.1  | 1.53 | 1.31 | 1.24 | 0.65 | 1    | 0.42 | 0.41 | 0.42 | 0.44 | 1.26 | 1.24 | 0.98 | 0.89 | 1.36 |
| Power Electronics                                 | 1.62 | 1.36 | 1.7  | 1.16 | 0.73 | 1.16 | 0    | 0    | 1.88 | 1.98 | 0    | 1.34 | 1.78 | 1.26 | 1.54 |
| Power Electronics lab                             | 1.8  | 1.7  | 1.8  | 1.3  | 0.7  | 1.4  | 0.4  | 0.4  | 1.9  | 0.4  | 2    | 1.5  | 1.8  | 1.2  | 1.6  |
| Digital Signal Processing                         | 2.8  | 1.8  | 1.6  | 2.4  | 1.8  | 1.4  | 0    | 0    | 0    | 0    | 2.2  | 1.4  | 2    | 2    | 2.2  |
| Microprocessors                                   | 2.21 | 2.08 | 2.01 | 1.9  | 1.93 | 2.06 | 2.09 | 2.06 | 2.12 | 2.19 | 2.08 | 2.2  | 2.02 | 2.02 | 2.02 |
| Microprocessors Lab                               | 3    | 1.66 | 1.66 | 2.33 | 3    | 1    | 0    | 0    | 0    | 1    | 2    | 1    | 3    | 3    | 2.66 |
| Tour and Training                                 | 1.87 | 1.38 | 3    | 2.2  | 2.35 | 1.4  | 1.9  | 0.9  | 3    | 3    | 2.2  | 0.9  | 1.9  | 1.9  | 2.23 |
| Electric Machines Design                          | 2.48 | 2.48 | 2.31 | 1.9  | 1.13 | 2.48 | 2.32 | 0.41 | 0.42 | 0.44 | 2.48 | 1.93 | 1.89 | 2.47 | 1.15 |
| Power System Protection                           | 2.22 | 2.28 | 2.01 | 1.72 | 1.16 | 2.18 | 1.92 | 0.41 | 0.42 | 0.44 | 2.18 | 1.79 | 1.76 | 2.17 | 1.18 |
| Power System Protection lab                       | 2.88 | 2.12 | 0.4  | 1.96 | 0.4  | 2.68 | 2.16 | 0.2  | 0.4  | 0.4  | 1.92 | 0.4  | 1.92 | 2.52 | 1.16 |
| Advanced Power Electronics                        | 2    | 2    | 2    | 1.3  | 0.2  | 0.2  | 0    | 0.6  | 0    | 0    | 0    | 0    | 1.3  | 2    | 1.3  |
| Selected topics in advanced control               | 1.93 | 2.14 | 1.4  | 1.87 | 0.35 | 1.81 | 1.25 | 0.81 | 1.31 | 1.11 | 2.33 | 2.4  | 0.88 | 2.14 | 2.07 |
| Power Systems-III                                 | 1.54 | 1.83 | 1.72 | 1.4  | 0.72 | 1.61 | 1.61 | 0    | 0    | 0    | 1.72 | 1.33 | 1.22 | 1.72 | 0.72 |
| Power Station Practice                            | 2.1  | 1.97 | 1.76 | 1.45 | 0.97 | 1.96 | 1.78 | 0.41 | 0.42 | 0.44 | 1.97 | 1.61 | 1.57 | 1.96 | 0.99 |
| Utilisation and traction                          | 2.22 | 2.09 | 2.05 | 2.01 | 2.01 | 2.07 | 2.17 | 2.11 | 2.21 | 2.18 | 2.11 | 2.25 | 2.14 | 2.16 | 2.07 |
| Maintenance and design of electrical substation   | 2.4  | 2.6  | 2    | 1.6  | 2    | 1.75 | 0    | 0    | 2    | 0    | 2.25 | 2.2  | 1.6  | 2    | 2.2  |
| Project                                           | 2.35 | 2.3  | 1.92 | 2.16 | 1.73 | 0.41 | 0.19 | 2.74 | 1.98 | 1.23 | 1.97 | 0.44 | 1.94 | 1.94 | 1.94 |
| Renewable sources of electrical energy            | 1.48 | 1.81 | 1.48 | 1.15 | 0.38 | 1.1  | 1.45 | 0.73 | 0    | 0    | 0.39 | 0.54 | 1.64 | 1.81 | 1.48 |
| High Voltage Engineering                          | 2    | 1.4  | 1.4  | 1.69 | 1.4  | 0.69 | 0.25 | 0    | 0    | 0    | 0    | 1.4  | 2    | 2    | 0.69 |
| Electrical Drives                                 | 2.7  | 1.9  | 2.1  | 1.7  | 2.4  | 1.8  | 1.5  | 0.4  | 2.3  | 0.4  | 1.9  | 1.8  | 2.4  | 2.2  | 2.1  |
| High voltage engineering lab                      | 2    | 1.33 | 1.33 | 0.67 | 1.33 | 0.67 | 0.36 | 0    | 0    | 0    | 0    | 1.33 | 2    | 1.75 | 0.58 |

### Gaps identified by Industry Experts

| Sl. | Identified Gap                                                  | Compensated Course Name    | Program Outcomes | Program Specific Outcomes |
|-----|-----------------------------------------------------------------|----------------------------|------------------|---------------------------|
| 1.  | Hands on experience of trouble shooting of house hold equipment | Basic Engineering Products | PO1,PO6,PO12     | PSO1                      |

|   |                                                                       |                            |                   |           |
|---|-----------------------------------------------------------------------|----------------------------|-------------------|-----------|
| 2 | Recent Technologies using in industry                                 | Modular Course             | PO1,PO3,PO5       | PSO2      |
| 3 | Artificial intelligent controllers for power electronic based systems | Soft Computing             | PO1,PO3,PO4,PO 5, | PSO2      |
| 4 | Specific knowledge is required in UPS technology.                     | Advanced Power Electronics | PO1, PO3          | PSO1,PSO2 |

**Gaps identified by Academic Experts**

| S.No | Identified Gap                                                   | Compensated Course Name                | Program Outcomes | Program Specific Outcomes |
|------|------------------------------------------------------------------|----------------------------------------|------------------|---------------------------|
| 1    | Knowledge on Environment and sustainability                      | Renewable Sources of Electrical Energy | PO7              | PSO1,PSO3                 |
| 2    | Practical behavior of EHV and UHV AC lines through simulation    | EHV AC & DC Transmission               | PO1,PO4          | PSO1                      |
| 3    | Smart grid and distributed generation concepts to be familiarize | Distribution System Automation         | PO1,PO4          | PSO1,PSO2                 |
| 4    | Financial Energy Management of the industry                      | Energy Economics                       | PO7,PO8,PO11,    | PSO1                      |
| 5    | Digital protection knowledge of power system to be imposed       | Advanced Power Electronics             | PO1,PO4          | PSO1,PSO2                 |

**Gaps identified by Students**

| S.No | Identified Gap                                                                                                                                       | Compensated Course Name      | Program Outcomes | Program Specific Outcomes |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------|---------------------------|
| 1.   | Knowledge on basic electrical concepts                                                                                                               | Basic Electrical Engineering | PO1, PO2         | PSO1,POS3                 |
| 2    | Knowledge on special machines                                                                                                                        | Electric Machine -II         | PO1,PO2          | PSO1,POS3                 |
| 3    | Taught at an 8 <sup>th</sup> -semester level as an elective course be shifted to 7 <sup>th</sup> -semester level with the same LTP as a core course. | Advanced Power Electronics   | PO1, PO2,PO3     | PSO1,POS2                 |

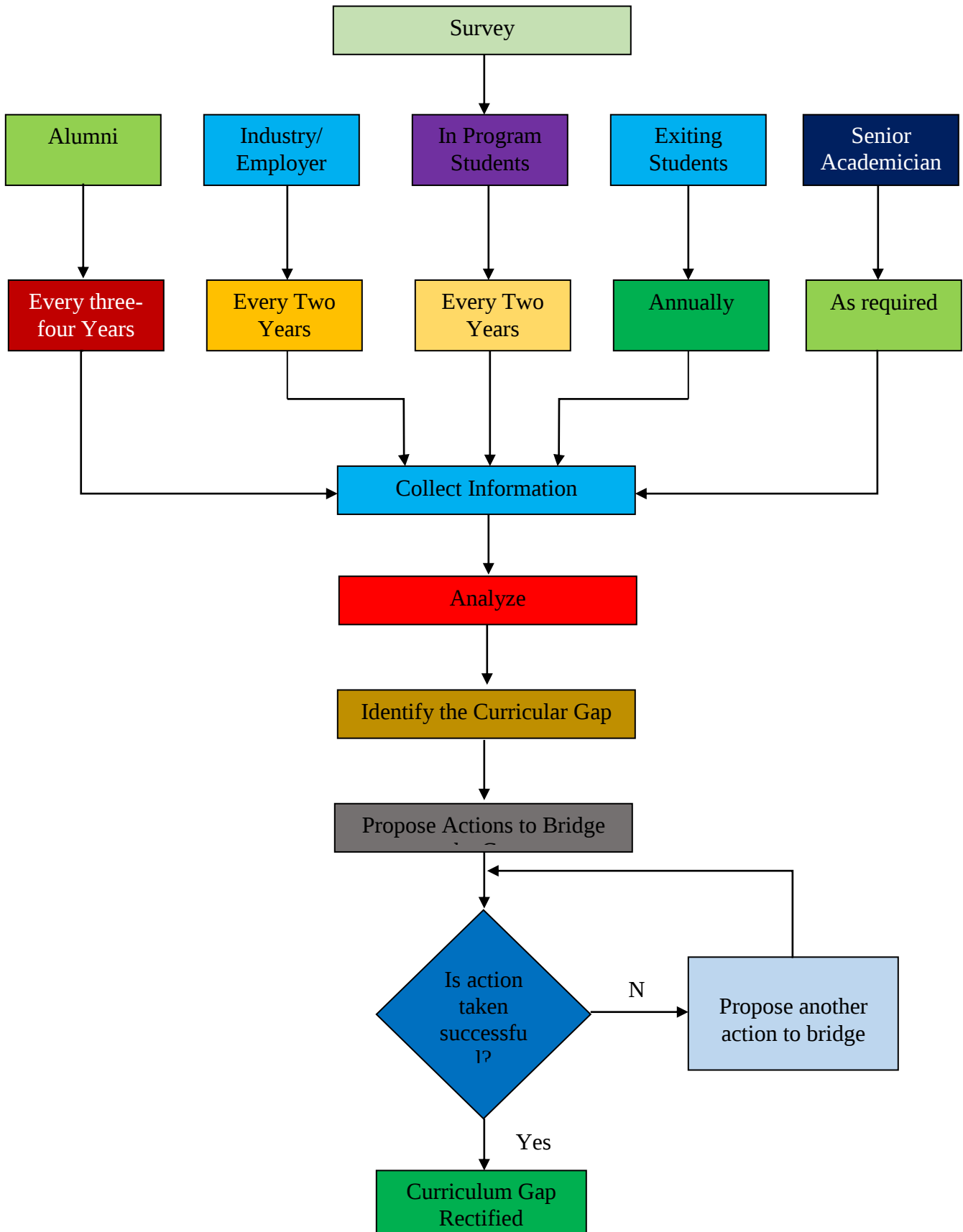


Figure : Process to identify the Curricular Gaps through Survey

**ALUMNI SURVEY**

|                                                                                                                                                                                                                                                          |                                |                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------|
| <b>Electrical Engineering Department</b><br><b><u>National Institute of Technology Srinagar</u></b><br><b>Alumni Survey Form</b>                                                                                                                         |                                |                                         |
| Thank you for taking the time to fill out this questionnaire. All the information will be kept confidential and will be used only for statistical purposes.                                                                                              |                                |                                         |
| <b>Alumni name</b>                                                                                                                                                                                                                                       |                                |                                         |
| <b>Year of Graduation</b>                                                                                                                                                                                                                                |                                |                                         |
| <b>Mailing address</b>                                                                                                                                                                                                                                   |                                |                                         |
| <b>Placement</b>                                                                                                                                                                                                                                         | <b>Before/after graduation</b> | <b>Core/Software</b>                    |
| <b>Name of the Company</b>                                                                                                                                                                                                                               |                                |                                         |
| Please rate each of the following skills, abilities or attributes in terms of their importance to state how well your education at <b>Chemical Engineering Department, National Institute of Technology, Srinagar</b> prepare you for these.             |                                |                                         |
| <b>Skills, Abilities and Attributes</b>                                                                                                                                                                                                                  |                                | <b>Scale (1 to 5) Excellent to poor</b> |
| Apply Knowledge of mathematics, Basic sciences and Engineering                                                                                                                                                                                           |                                |                                         |
| Problem Identification and Analysis                                                                                                                                                                                                                      |                                |                                         |
| Design a system and develop solution to the problem                                                                                                                                                                                                      |                                |                                         |
| Investigate and handle complex problems                                                                                                                                                                                                                  |                                |                                         |
| Ability to use techniques and tools in engineering practice                                                                                                                                                                                              |                                |                                         |
| Understand and appreciate the impact of engineering in the societal and global contexts                                                                                                                                                                  |                                |                                         |
| Awareness of existing issues (e.g. Economics of engineering, Environmental issues)                                                                                                                                                                       |                                |                                         |
| Understand professional and ethical responsibilities as an engineer (e.g., safety, professional ethics, code of conduct)                                                                                                                                 |                                |                                         |
| Function effectively in teams                                                                                                                                                                                                                            |                                |                                         |
| Proficient in English language in both communicative and technical forms                                                                                                                                                                                 |                                |                                         |
| Awareness of the need for life-long learning (Seeking further education, self-learning, Membership in professional societies)                                                                                                                            |                                |                                         |
| Project Management and Finance                                                                                                                                                                                                                           |                                |                                         |
| Ability to apply the principles and practices of Chemical Engineering discipline along with the basic sciences and humanities to solve the complex engineering problems concerning the issues of environment, safety, economics, culture and society etc |                                |                                         |
| Apply the new knowledge with professional responsibility and ethics towards the advancement of academic and research pursuits in chemical and allied disciplines in the societal contexts                                                                |                                |                                         |
| Design, develop and modify the chemical processes and to analyze these by applying the physicochemical and biological techniques                                                                                                                         |                                |                                         |
| <b>Signature</b>                                                                                                                                                                                                                                         | <b>Suggestion if any:</b>      |                                         |

## EMPLOYER SURVEY

| <b>Electrical Engineering Department</b><br><b><u>National Institute of Technology, Srinagar</u></b><br><b>Employer Survey Form</b>                                                                                                        |                                                                                                                                                              |                  |               |                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------|-------------------------|
| The purpose of this survey is to obtain Employer's input on the quality of education of undergraduate programs in NIT, Srinagar. Your sincere cooperation would enable us to improve the quality of our graduates as per your requirements |                                                                                                                                                              |                  |               |                         |
| Name of Company/ Organization                                                                                                                                                                                                              |                                                                                                                                                              |                  |               |                         |
| Mailing address                                                                                                                                                                                                                            |                                                                                                                                                              |                  |               |                         |
| Sector Private/Public/Academia                                                                                                                                                                                                             |                                                                                                                                                              |                  |               |                         |
| What are the pertinent employability skills to stay updated in current industry trends and thereby improve the quality of the undergraduate program?                                                                                       |                                                                                                                                                              | Logical Thinking | Good Aptitude | Excellent Communication |
| Rate NIT Srinagar Graduates working in your organization using the following criterion.<br><b>Put tick mark Knowledge, Skills, Abilities, Attitude and other Attributes expected out of NIT Srinagar graduates.</b>                        |                                                                                                                                                              |                  |               |                         |
| Sl. No.                                                                                                                                                                                                                                    | Overall, are you satisfied with                                                                                                                              | Excellent (3)    | Good (2)      | Satisfied(1)            |
| i.                                                                                                                                                                                                                                         | Capacity for development and analysis of engineering problems and formulation of appropriate solutions, retaining professional and ethical responsibilities. |                  |               |                         |
| ii.                                                                                                                                                                                                                                        | Aptitude for self-education, ability to learn new skills and a clear appreciation for the value of life-long learning to update professional knowledge.      |                  |               |                         |
| iii.                                                                                                                                                                                                                                       | Understanding professional engineering solutions for sustainable development and their application in global, national and societal contexts.                |                  |               |                         |
| iv.                                                                                                                                                                                                                                        | Competence for acquiring new skills and applying them in research and development.                                                                           |                  |               |                         |
| v.                                                                                                                                                                                                                                         | Fundamental knowledge in mathematics and science and professional fluency in English both communicative and technical forms.                                 |                  |               |                         |
| vi.                                                                                                                                                                                                                                        | Dexterity in differentiation of management techniques and possession of leadership skills that enable successful function of multi-disciplinary teams.       |                  |               |                         |
| Name and Designation:                                                                                                                                                                                                                      |                                                                                                                                                              | Signature:       |               |                         |

## IN PROGRAM STUDENTS SURVEY

|                                                                                                                                                                                             |                                                                                                                                                      |                         |                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------|
| <b>National Institute of Technology, Srinagar</b><br><b><u>Electrical Engineering Department</u></b><br><b>In-Program Student Survey Form</b>                                               |                                                                                                                                                      |                         |                      |
| <b>Name:</b>                                                                                                                                                                                |                                                                                                                                                      | <b>Year Passed out:</b> |                      |
| <b>Email:</b>                                                                                                                                                                               |                                                                                                                                                      | <b>Phone</b>            |                      |
| <b>Assessment of Knowledge, Skills, Abilities and Attributes presently acquired at NIT Srinagar</b>                                                                                         |                                                                                                                                                      |                         |                      |
| Please rate each of the following Knowledge, Skills, Abilities, Attitudes or attribute in terms how well NIT Srinagar inculcated them in your education so far. (tick mark the your choice) |                                                                                                                                                      |                         |                      |
| i.                                                                                                                                                                                          | Ability to acquire and apply knowledge of basic mathematics, science and engineering fundamentals. If not satisfied give your suggestions to improve |                         |                      |
|                                                                                                                                                                                             | <b>Extremely Satisfied</b>                                                                                                                           | <b>Satisfied</b>        | <b>Not Satisfied</b> |
| ii.                                                                                                                                                                                         | Ability to apply analytical skills to engineering problems. If not satisfied give your suggestions to improve                                        |                         |                      |
|                                                                                                                                                                                             | <b>Extremely Satisfied</b>                                                                                                                           | <b>Satisfied</b>        | <b>Not Satisfied</b> |
| iii.                                                                                                                                                                                        | Ability to conduct experiments, analyze data, and present results. If not satisfied give your suggestions to improve                                 |                         |                      |
|                                                                                                                                                                                             | <b>Extremely Satisfied</b>                                                                                                                           | <b>Satisfied</b>        | <b>Not Satisfied</b> |
| iv.                                                                                                                                                                                         | Ability to conduct independent research for information required in engineering problem Solving. If not satisfied give your suggestions to improve   |                         |                      |
|                                                                                                                                                                                             | <b>Extremely Satisfied</b>                                                                                                                           | <b>Satisfied</b>        | <b>Not Satisfied</b> |
| v.                                                                                                                                                                                          | Ability to use modern technologies and tools necessary for practice. If not satisfied give your suggestions to improve                               |                         |                      |
|                                                                                                                                                                                             | <b>Extremely Satisfied</b>                                                                                                                           | <b>Satisfied</b>        | <b>Not Satisfied</b> |
| vi.                                                                                                                                                                                         | Ability to understand global issues related to engineering. If not satisfied give your suggestions to improve.                                       |                         |                      |
|                                                                                                                                                                                             | <b>Extremely Satisfied</b>                                                                                                                           | <b>Satisfied</b>        | <b>Not Satisfied</b> |
| vii.                                                                                                                                                                                        | Understand the importance of ethical and professional responsibility. If not satisfied give your suggestions to improve                              |                         |                      |
|                                                                                                                                                                                             | <b>Extremely Satisfied</b>                                                                                                                           | <b>Satisfied</b>        | <b>Not Satisfied</b> |
| viii.                                                                                                                                                                                       | An ability to function on multi-disciplinary teams. If not satisfied give your suggestions to improve                                                |                         |                      |
|                                                                                                                                                                                             | <b>Extremely Satisfied</b>                                                                                                                           | <b>Satisfied</b>        | <b>Not Satisfied</b> |
| ix.                                                                                                                                                                                         | An ability to communicate effectively. If not satisfied give your suggestions to improve                                                             |                         |                      |
|                                                                                                                                                                                             | <b>Extremely Satisfied</b>                                                                                                                           | <b>Satisfied</b>        | <b>Not Satisfied</b> |
| x.                                                                                                                                                                                          | A recognition of the need for, and an ability to engage in life-long learning. If not satisfied give your suggestions to improve                     |                         |                      |
|                                                                                                                                                                                             | <b>Extremely Satisfied</b>                                                                                                                           | <b>Satisfied</b>        | <b>Not Satisfied</b> |

| <b>EXITING STUDENTS SURVEY</b><br><b>Electrical Engineering Department</b><br><b>National Institute of Technology, Srinagar</b><br><b>Exiting Students Survey Form</b>                             |                                                                                               |                  |                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------|----------------------|
| Name:                                                                                                                                                                                              |                                                                                               | Enrollment. No:  |                      |
| Phone No.                                                                                                                                                                                          |                                                                                               | Email:           |                      |
| <b>Assessment of Abilities, Skills and Attributes acquired at NIT Srinagar.</b><br>Please rate each of the following items in terms how well your education at NIT Srinagar prepared you for them. |                                                                                               |                  |                      |
| 1.                                                                                                                                                                                                 | Basic knowledge in mathematics, science, engineering and humanities.                          |                  |                      |
|                                                                                                                                                                                                    | <b>Extremely Satisfied</b>                                                                    | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 2.                                                                                                                                                                                                 | Ability to identify, analyse and solve chemical engineering problems                          |                  |                      |
|                                                                                                                                                                                                    | <b>Extremely Satisfied</b>                                                                    | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 3.                                                                                                                                                                                                 | Ability to design and develop solutions for chemical engineering problems                     |                  |                      |
|                                                                                                                                                                                                    | <b>Extremely Satisfied</b>                                                                    | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 4.                                                                                                                                                                                                 | Ability to investigate the complex chemical engineering problems and their solutions          |                  |                      |
|                                                                                                                                                                                                    | <b>Extremely Satisfied</b>                                                                    | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 5.                                                                                                                                                                                                 | Use of research-based knowledge and research methods                                          |                  |                      |
|                                                                                                                                                                                                    | <b>Extremely Satisfied</b>                                                                    | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 6.                                                                                                                                                                                                 | Demonstrate the ability to apply advanced technologies to solve contemporary and new problems |                  |                      |
|                                                                                                                                                                                                    | <b>Extremely Satisfied</b>                                                                    | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 7.                                                                                                                                                                                                 | Understanding professional engineering solutions in societal and environmental contexts       |                  |                      |
|                                                                                                                                                                                                    | <b>Extremely Satisfied</b>                                                                    | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 8.                                                                                                                                                                                                 | Understanding of professional and ethical responsibility                                      |                  |                      |
|                                                                                                                                                                                                    | <b>Extremely Satisfied</b>                                                                    | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 9.                                                                                                                                                                                                 | Ability to function as an effective member in multi-disciplinary teams                        |                  |                      |
|                                                                                                                                                                                                    | <b>Extremely Satisfied</b>                                                                    | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 10.                                                                                                                                                                                                | Proficient in English language in both communicative and technical forms                      |                  |                      |
|                                                                                                                                                                                                    | <b>Extremely Satisfied</b>                                                                    | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 11.                                                                                                                                                                                                | Demonstrate the ability to choose and apply appropriate resource management techniques        |                  |                      |
|                                                                                                                                                                                                    | <b>Extremely Satisfied</b>                                                                    | <b>Satisfied</b> | <b>Not Satisfied</b> |

|     |                                                                                                                                                                                                                                                           |                  |                      |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------|
| 12. | Capable of self-education and clearly understand the value of updating their professional knowledge to engage in life-long learning                                                                                                                       |                  |                      |
|     | <b>Extremely Satisfied</b>                                                                                                                                                                                                                                | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 13. | Ability to apply the principles and practices of Chemical Engineering discipline along with the basic sciences and humanities to solve the complex engineering problems concerning the issues of environment, safety, economics, culture and society etc. |                  |                      |
|     | <b>Extremely Satisfied</b>                                                                                                                                                                                                                                | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 14. | Ability to acquire and apply the new knowledge with professional responsibility and ethics towards the advancement of academic and research pursuits in chemical and allied disciplines in the societal contexts.                                         |                  |                      |
|     | <b>Extremely Satisfied</b>                                                                                                                                                                                                                                | <b>Satisfied</b> | <b>Not Satisfied</b> |
| 15. | Design, develop and modify the chemical processes and to analyze these by applying the physicochemical and biological techniques.                                                                                                                         |                  |                      |
|     | <b>Extremely Satisfied</b>                                                                                                                                                                                                                                | <b>Satisfied</b> | <b>Not Satisfied</b> |

1. Please list some very important skills that you think you had learned in the engineering program.
2. Please write down any comments or suggestions that you think will improve the engineering programs at NIT Srinagar.
3. Please comment about the department Vision and Mission:

### **Measures and processes used to improve curriculum**

In view of the gaps identified, BOS meeting was held on 16-07-2012 and the following changes were made to the course curriculum:

1. The Elective IV [Advanced Power Electronics] with LTP 3:1:0:4 taught at an 8<sup>th</sup>-semester level as an elective course be shifted to 7<sup>th</sup>-semester level with the same LTP as a core course.
2. The “Electric Drives” along with Lab Course taught at 7<sup>th</sup> semester as core course with LTP 2:1:2:4 are shifted to 8<sup>th</sup>-semester level as an elective with same LTP.
3. Moreover, “Virtual Instrumentation Lab” being taught at the 8<sup>th</sup> semester level with the LTP 0:0:2:1 be clubbed with control system-II Lab. At the 5<sup>th</sup> semester level. The Lab Course is also renamed as Control System and Instrumentation Lab with LTP 0:0:2:1.  
This will also help to reduce the number of credits from 26 to 25 at 8<sup>th</sup> semester, so that uniformly in terms of No. of credits at each semester is maintained i.e 25 credits per semester.
4. The reformulated scheme of courses for the 5<sup>th</sup> semester, 7<sup>th</sup> semester and 8<sup>th</sup> semester for 2010 batch onwards after making correction are appended along-with List of Electives.

Another meeting of BOS was held on 27-08-2014. It was suggested to modify the present B.Tech curriculum to conform to the present requirements and objectives. It was resolved to make the following changes in the scheme:

1. **3<sup>rd</sup> semester:**
  - i) The course “Principles of Electrical Engineering” shall be renamed as “Basic Electrical Engineering”, similarly “Principles of Electrical Engineering”.
  - ii) The course “Mechanical Engineering” taught by Electrical Engineering Department of the Institute was suggested to be renamed as Engineering Thermodynamics.
2. **4<sup>th</sup> semester:**  
The course No. ELE 404 i.e. Non-Conventional Energy Sources was decided to be dropped and introduce it as an elective at higher semester level with the modified syllabus. According to the revised credit structure of following courses was revised as follows:
 

|                                                   |         |
|---------------------------------------------------|---------|
| • Control system-I                                | 3 1 0 4 |
| • Electric measurements and measuring Instruments | 3 1 0 4 |
| • Electronics-II                                  | 3 1 0 4 |
3. **5<sup>th</sup> semester:**  
Power System Lab-I which was earlier dropped from 5<sup>th</sup> semester was reintroduced. Accordingly, the revised credit structure of Power System-I is 2 1 0 (3 credits) and for Power, System Lab will be 0 0 2(1 credit)
4. **6<sup>th</sup> semester:**  
The course No. ELE-603 was decided to be renamed as Electric Machine Design instead of Computer-Aided Design of Electric Machines and course no. ELE-603P (Computer

Aided Design Lab) was dropped. Furthermore the syllabus of course no. ELE-602 i.e. Power Electronics was modified as proposed by the concerned course in charge and DMC (Departmental Monitoring Committee). Also the credit structure, of course, ELE-606 i.e. Microprocessor was revised to 3 1 0 4.

**5. 7<sup>th</sup> semester:**

The courses: General Management and Economics (HSS-701) and one of the electives were shifted to 8<sup>th</sup> semester and instead Power system-III and Power Station Practice was included in 7<sup>th</sup> semester. The syllabus of Advanced Power Electronics was revised as proposed by course in charge and DMC.

**6. 8<sup>th</sup> semester:**

Due to the decision at 5, the courses Power system-III and Power Station Practice were shifted to 7<sup>th</sup> semester and accordingly courses “General Management & Economics” and one elective is shifted to 8<sup>th</sup> semester. Furthermore the course Non-Conventional Energy Sources dropped at 4<sup>th</sup>-semester level was included in 8<sup>th</sup>-semester level as an elective with modification of syllabus with the new title “Renewable Sources of Electrical Energy”.

It was further decided that Elective-IV i.e High Voltage Engineering be treated as core course instead of electives.

**7. Electives:**

It was decided to have a common list of electives to be floated at a 7<sup>th</sup> and 8<sup>th</sup>-semester level to have more flexibility. Further, the electives i) Restructuring of Power System ii) Power System Optimization iii) FACTS iv) Fuzzy Logic and Neural Network (renamed as Soft Computing) and v) Stand Alone Power System will be dropped from the list as these were introduced at M.Tech level.

Further, the meeting of the Departmental Under-Graduate Committee (DUGC) was held on June 13, 2019.

The committee deliberated upon some academic matters and proposed the following changes in the under-graduate courses offered by the department:

1. The course structure for B Tech in Electrical Engineering for the batch starting from Autumn 2019 was finalized and is attached as Annexure 2.1.
2. As decided in the last meeting of DUGC, Basic Electrical Engineering Course will henceforth be offered in I<sup>st</sup> year to Electrical Engineering students as well as to other allied branches. In order to optimize the resources and for equitable distribution of teaching load, it was decided to offer the Basic Electrical Engineering course (Theory & Lab) to Electrical Engineering, Civil Engineering (two sections), and Chemical Engineering in I<sup>st</sup> semester, and to other branches viz. ECE, Mechanical Engineering,

CSE, IT and Metallurgical Engineering in 2<sup>nd</sup> semester. The other departments are requested to make necessary changes in their course structures accordingly.

3. Since the Basic Electrical Engineering course offered to Electrical Engineering students at present in 3<sup>rd</sup> Semester has been slashed, the 4-credits of this course are distributed with one additional credit to Electronics-I, EMF & Waves, Electrical Engineering Materials and Mathematics-III.
4. In B.Tech 5<sup>th</sup> Semester, Control Systems-II course to have 4-credits instead of 3 credits and Computer Aided Simulation of Electrical Machines to have 1-credit instead of two credits with two contact hours per week.
5. In B.Tech 5<sup>th</sup> semester, Microprocessors and DSP Lab. to be named Microprocessors Lab.
6. In B.Tech 7<sup>th</sup> semester, Electronics Measurement and Instrumentation Lab. to be slashed and instead Power Station Practice Lab (Field Visits) of 1 credit is proposed. Project Preliminary Work and Seminar to be shown as separate courses.
7. In B.Tech 8<sup>th</sup> Semester, Project to have 9-credits only with 1 additional credit to Elective-I, Elective-II and High Voltage Engineering.

## 2.2. TEACHING-LEARNING PROCESSES (70)

### 2.2.1. Process followed to improve the quality of Teaching-Learning (15)

#### A. Adherence to academic calendar Academic Calendar Year 2019-2020 (2)

| Month           | Activities Planned                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>February</b> | Registration B.Tech. (Spring 2019 session)<br>Commencement of classes<br>Registration for P.G and PhD (Spring 2019 session)<br>Registration B.Tech. Even Semesters, M.Tech./M.Sc. 2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D. (Spring 2018 session)<br>Registration with late fee B.Tech., M.Tech./M.Sc. 2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D. (Spring 2019 session)<br>Commencement of Classes |
| <b>March</b>    | Extra-Curricular Activities – 5-day workshop on Project Planning                                                                                                                                                                                                                                                                                                                                          |
| <b>April</b>    | Mid-Term examinations<br>TECHVAGANZA                                                                                                                                                                                                                                                                                                                                                                      |

|                  |                                                                                                                                                                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>May</b>       | Advertisement for admission to M.Tech (sponsored) ,<br>Alumni Visit:<br>Practical Examinations;<br>Advertisement for PH.D. admissions;<br>End Semester Examination B.Tech. 8 <sup>th</sup> Semester                                                                                     |
| <b>June</b>      | B.Tech. Project Viva-voce Examination<br>Registration for Supplementary examinations<br>End Semester Examination B.Tech. 2 <sup>nd</sup> , 4 <sup>th</sup> and 6 <sup>th</sup> Semesters, M.Tech. /M.Sc.<br>2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D.<br>Summer breaks for students |
| <b>July</b>      | Supplementary Examinations for odd semester; Special<br>Supplementary Examinations for 8 <sup>th</sup> Semester;<br>Registration for U.G./ P.G. / Ph.D. (Autumn 2019);                                                                                                                  |
| <b>August</b>    | Commencement of classes; Registration with late fee<br>Fresher's Orientation Day                                                                                                                                                                                                        |
| <b>September</b> | Extra-Curricular Activities – Sports Event;<br>Mid-Term Examination ;<br>Convocation                                                                                                                                                                                                    |
| <b>October</b>   | Celebration of Rashtriya Ekta Diwas; Run for Unity; National Innovation Day                                                                                                                                                                                                             |
| <b>November</b>  | National Entrepreneurship Day;<br>Practical Examinations; End Semester Examinations; Registration<br>for Supplementary Examination for Even Semester                                                                                                                                    |
| <b>December</b>  | Supplementary Examination for Even Semester;<br>Winter Vacations for students                                                                                                                                                                                                           |

The calendar was implemented as per schedule up to 4<sup>th</sup> August 2019 but thereafter due situations beyond institute control, the activities up to 15<sup>th</sup> Oct 2019 were rescheduled from Oct, 2019 and completed up to Jan 2020 utilizing full winter vacation and holidays thereby ensuring that the academic calendar for 2019 is achieved without any loss of time.

**Adherence to Academic Calendar (2018-2019)**

| <b>Month</b>     | <b>Activities Planned</b>                                                                                                                                                                                                                                                                                                                                                                           |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>February</b>  | Registration B.Tech. 8 <sup>th</sup> Semester (Spring 2018 session)<br>Commencement of classes for B.Tech. 8 <sup>th</sup> Semester<br>Registration with late fee B.Tech. 8 <sup>th</sup> Semester (Spring 2018 session)<br>Registration B.Tech. 2 <sup>nd</sup> , 4 <sup>th</sup> and 6 <sup>th</sup> Semesters, M.Tech./M.Sc. 2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D. (Spring 2018 session) |
| <b>March</b>     | Registration with late fee B.Tech. 2 <sup>nd</sup> , 4 <sup>th</sup> and 6 <sup>th</sup> Semesters, M.Tech./M.Sc. 2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D. (Spring 2018 session)<br>Commencement of classes for B.Tech. 2 <sup>nd</sup> , 4 <sup>th</sup> and 6 <sup>th</sup> Semesters, M.Tech./M.Sc. 2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D.                                           |
| <b>April</b>     | Mid-Term exam B.Tech. 8 <sup>th</sup> Semester<br>Mid-Term exam B.Tech. 2 <sup>nd</sup> , 4 <sup>th</sup> and 6 <sup>th</sup> Semesters, M.Tech./M.Sc. 2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D.;<br>Alumni Meet-2018; Extra-Curricular Activities                                                                                                                                              |
| <b>May</b>       | Annual Day;<br>Practical Examinations;<br>Advertisement for PH.D. admissions;<br>End Semester Examination B.Tech. Semester                                                                                                                                                                                                                                                                          |
| <b>June</b>      | B.Tech. Project Viva-voce Examination<br>End Semester Examination B.Tech. 2 <sup>nd</sup> , 4 <sup>th</sup> and 6 <sup>th</sup> Semesters, M.Tech./M.Sc. 2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D.                                                                                                                                                                                              |
| <b>July</b>      | M.Tech. Dissertation Viva-voce Exam;<br>Supplementary Examinations for odd semester; Summer Break;<br>Special Supplementary Examinations for 8 <sup>th</sup> Semester; Registration for U.G./ P.G. / Ph.D. (Autumn 2018); Commencement of classes;<br>Registration with late fee                                                                                                                    |
| <b>August</b>    | Fresher's Orientation Day                                                                                                                                                                                                                                                                                                                                                                           |
| <b>September</b> | Extra-Curricular Activities; Mid-Term Examination; Convocation<br>Alumni Meet Delhi Chapter                                                                                                                                                                                                                                                                                                         |
| <b>October</b>   | Tech. Fest/ ECA<br>National Innovation Day                                                                                                                                                                                                                                                                                                                                                          |
| <b>November</b>  | Practical Examination;<br>National Entrepreneur Day<br>End Semester Examination; Supplementary Examination for Even Semester                                                                                                                                                                                                                                                                        |
| <b>December</b>  | Winter Vacations for students                                                                                                                                                                                                                                                                                                                                                                       |

The calendar was implemented and achieved in full with very minor reschedules.

**Academic Calendar for the Year 2017-18**

| <b>Month</b>     | <b>Activities Planned</b>                                                                                                                                                                                                       |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>February</b>  | Registration (Spring 2017 session)                                                                                                                                                                                              |
| <b>March</b>     | Late Registration (Spring 2017 session)<br>Teaching (8 <sup>th</sup> Semester); Teaching (other Semesters)                                                                                                                      |
| <b>April</b>     | 1 <sup>st</sup> Minor Examination<br>Extra-Curricular Activities                                                                                                                                                                |
| <b>May</b>       | 2 <sup>nd</sup> Minor Examination<br>Alumni Day<br>Annual Day                                                                                                                                                                   |
| <b>June</b>      | B.Tech. Project Viva-voce Examination<br>End-Term Examination (8 <sup>th</sup> Semester)<br>End-Term Examination (Other even Semesters)<br>Result Declaration (8 <sup>th</sup> Semester)<br>M.Tech. Dissertation Viva-voce Exam |
| <b>July</b>      | Result Declaration (M.Tech); Supplementary Examinations for odd semester;<br>Result Declaration (all semesters)<br>Registration (Autumn 2017 session); Late Registration (Autumn 2017 session); Teaching; Tech. Fest            |
| <b>August</b>    | Fresher's Orientation Day<br>1 <sup>st</sup> Minor Examination                                                                                                                                                                  |
| <b>September</b> | Extra-Curricular Activities<br>Convocation 2016                                                                                                                                                                                 |
| <b>October</b>   | 2 <sup>nd</sup> Minor                                                                                                                                                                                                           |
| <b>November</b>  | End Term Examination for odd semesters                                                                                                                                                                                          |
| <b>December</b>  | Supplementary Examination for Even Semester<br>Result Declaration (all semesters);<br>Winter Vacations for students                                                                                                             |

The calendar was implemented and achieved very satisfactorily.

| SPRING-2020                            |                                                                                                                                                                            |                                                                                  |                                                                                                                          |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| REGISTRATION & COMMENCEMENT OF CLASSES |                                                                                                                                                                            |                                                                                  |                                                                                                                          |
| 1.                                     | Registration for U.G                                                                                                                                                       | Date of Registration                                                             | Commencement of classes                                                                                                  |
| 2.                                     | 2 <sup>nd</sup> semester<br>4 <sup>th</sup> semester<br>6 <sup>th</sup> semester<br>8 <sup>th</sup> semester                                                               | 9 &11 March,2020<br>12-13 March,2020<br>16-17 March,2020<br>9 & 11<br>March,2020 | 12 <sup>th</sup> March,2020<br>16 <sup>th</sup> March,2020<br>18 <sup>th</sup> March,2020<br>12 <sup>th</sup> March,2020 |
| 3.                                     | Registration for P.G &Ph.D.                                                                                                                                                | 9 & 11<br>March,2020                                                             | 12 <sup>th</sup> March,2020                                                                                              |
| 4.                                     | Registration with late fee:For next 04 days after the last permissible registration date(s) @ Rs.400/- per day in each category and Rs.800/- for next subsequent four days |                                                                                  |                                                                                                                          |
| 5.                                     | Sports Week                                                                                                                                                                |                                                                                  | 11-04-2020 to 13-04 -2020                                                                                                |
| 6.                                     | Mid-Term Examinations                                                                                                                                                      |                                                                                  | 04-05-2020                                                                                                               |
| 7.                                     | Advertisement for admission to:<br>a) M.Tech (sponsored category) b) Ph.D.                                                                                                 |                                                                                  | Last week of May                                                                                                         |
|                                        | END-TERM EXAMINATIONS                                                                                                                                                      |                                                                                  |                                                                                                                          |
| 8.                                     | B.Tech Project Viva-Voce& Practical Examinations                                                                                                                           |                                                                                  | Last week of May                                                                                                         |
| 9.                                     | B.Tech8 <sup>th</sup> Semester End-Term Examination                                                                                                                        |                                                                                  | 01-06-2020                                                                                                               |
| 10.                                    | U.G, PG &Ph.D.End-Term Examination                                                                                                                                         |                                                                                  | 15-06-2020                                                                                                               |
| 11.                                    | Registration for Supplementary Exam (Even Semester)                                                                                                                        |                                                                                  | 01-06-2020 to 10-06-2020                                                                                                 |
| 12.                                    | Registration for Supplementary Exam (Odd Semester)                                                                                                                         |                                                                                  | 15-06-2020 to 26-06-2020                                                                                                 |
| 13.                                    | Supplementary Exam (Odd Semester)                                                                                                                                          |                                                                                  | 02-07-2020                                                                                                               |
|                                        | AUTUMN-2020                                                                                                                                                                |                                                                                  |                                                                                                                          |
|                                        | REGISTRATION & COMMENCEMENT OF CLASSES                                                                                                                                     |                                                                                  |                                                                                                                          |
| 1.                                     | Registration for U.G, P.G &Ph.D.                                                                                                                                           |                                                                                  | 27-07-2020 to 31-07-2020                                                                                                 |
| 2.                                     | Registration with late fee @ Rs.400/- per day                                                                                                                              |                                                                                  | Upto 05-08-2020                                                                                                          |
| 3.                                     | Commencement of classes for all semesters                                                                                                                                  |                                                                                  | 03-08-2020                                                                                                               |
| 4.                                     | Fresher's Orientation day                                                                                                                                                  |                                                                                  | 23-08-2020                                                                                                               |
| 5.                                     | Techvaganza                                                                                                                                                                |                                                                                  | 05-09-2020                                                                                                               |
| 6.                                     | Mid-Term Examinations                                                                                                                                                      |                                                                                  | 14-09-2020                                                                                                               |
| 7.                                     | Convocation                                                                                                                                                                |                                                                                  | Date to be declared                                                                                                      |
| 8.                                     | National Entrepreneurship Day                                                                                                                                              |                                                                                  | Date to be declared                                                                                                      |
|                                        | END-TERM EXAMINATIONS                                                                                                                                                      |                                                                                  |                                                                                                                          |
| 9.                                     | End Semester Examinations                                                                                                                                                  |                                                                                  | From 09-11-2020                                                                                                          |
| 10.                                    | Registration for Supplementary Exam (Odd Sem)                                                                                                                              |                                                                                  | 19-10-2020 to 29-10-2020                                                                                                 |
| 11.                                    | Registration for Supplementary Exam (Even Sem)                                                                                                                             |                                                                                  | 09-11-2020 to 19-11-2020                                                                                                 |
| 12.                                    | Supplementary Exam (Even Semester)                                                                                                                                         |                                                                                  | From 23-11-2020                                                                                                          |
| 13.                                    | Winter Vacations for Students                                                                                                                                              |                                                                                  | 07-12-2020                                                                                                               |

Table B.2.2.1a: Academic Calendar for the Calendar Year 2020

| SPRING-2019                            |                                                                                                                                |                                  |            |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------|
| S.No.                                  | Activity                                                                                                                       | Date                             |            |
|                                        |                                                                                                                                | From                             | To         |
| 1.                                     | Reopening of Institution                                                                                                       | 18-02-2019                       |            |
|                                        | Registration for U.G, P.G &Ph.D.                                                                                               | 18-02-2019                       | 22-02-2019 |
|                                        | Registration with late fee @ Rs.400/- per day                                                                                  | 25-02-2019                       | 28-02-2019 |
|                                        | Commencement of classes                                                                                                        | 25-02-2019                       |            |
| 2.                                     | Mid-Term Examinations                                                                                                          | 18-04-2019                       |            |
| 3.                                     | Techvaganza                                                                                                                    | 27-04-2019 & 28-04-2019          |            |
| 4.                                     | Advertisement for admission to:<br>a) M.Tech (sponsored category)<br>b) Ph.D.                                                  | 3 <sup>rd</sup> week of May      |            |
|                                        | End-Term Examinations                                                                                                          |                                  |            |
| 5.                                     | B.Tech 8 <sup>th</sup> Semester                                                                                                | From 23-05-2019                  |            |
|                                        | B.Tech Project Viva-Vice Exam                                                                                                  | 10-06-2019 to 13-06-2019         |            |
|                                        | Registration for Supplementary Examinations with regular candidates                                                            | 03-06-2019 to 07-06-2019         |            |
|                                        | B.Tech 2 <sup>nd</sup> , 4 <sup>th</sup> & 6 <sup>th</sup> M.Tech/ M.Sc. 2 <sup>nd</sup> & 4 <sup>th</sup> semesters and Ph.D. | From 10-06-2019                  |            |
| 6.                                     | Registration for Supplementary Examinations (Odd Semester)                                                                     | 24-06-2019 to 02-07-2019         |            |
| 7.                                     | Supplementary Examinations for odd Sems                                                                                        | From 04-07-2019                  |            |
| 8.                                     | Registration for Special Supplementary Exam for 8 <sup>th</sup> semester                                                       | 01-07-2019 to 11-07-2019         |            |
| 9.                                     | Special Supplementary Examinations for 8 <sup>th</sup> Sem                                                                     | From 15-07-2019                  |            |
| 10.                                    | Summer Break                                                                                                                   | 23-06-2019                       | 28-07-2019 |
| Autumn-2019                            |                                                                                                                                |                                  |            |
| Registration & Commencement of Classes |                                                                                                                                |                                  |            |
| 1.                                     | Registration for U.G, P.G &Ph.D.                                                                                               | 29-07-2019                       | 01-08-2019 |
|                                        | Registration with late fee @ Rs.400/- per day                                                                                  | Upto 05-08-2019                  |            |
|                                        | Commencement of classes                                                                                                        | 20-08-2019                       |            |
| 2.                                     | Fresher's Orientation day                                                                                                      | 20-08-2019                       |            |
| 3.                                     | Sports Events                                                                                                                  | 06-09-2019                       | 08-09-2019 |
| 4.                                     | Mid-Term Examinations                                                                                                          | 16-09-2019                       |            |
| 5.                                     | Convocation                                                                                                                    | 28-09-2019                       |            |
| 6.                                     | National Entrepreneurship Day                                                                                                  | 09-11-2019                       |            |
| End-Term Examinations                  |                                                                                                                                |                                  |            |
| 7.                                     | Practical Examinations                                                                                                         | 1 <sup>st</sup> week of November |            |
| 8.                                     | Registration for Supplementary Examinations with regular candidates                                                            | 01-11-2019 to 07-11-2019         |            |
| 9.                                     | End Semester Examinations                                                                                                      | From 11-11-2019                  |            |
| 10.                                    | Registration for Supplementary Examinations (Even Sem)                                                                         | 20-11-2019 to 28-11-2019         |            |
| 11.                                    | Supplementary Examinations for Even Sems                                                                                       | From 01-12-2019                  |            |
| 12.                                    | Winter Vacations for Students                                                                                                  | 10-12-2019                       |            |

Table B.2.2.1b: Academic Calendar for the Calendar Year 2019

| SPRING-2018 |                                                                                                                                                                  |                          |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| S.No.       | Activity                                                                                                                                                         | Date                     |
| 1.          | Registration B.Tech. 8 <sup>th</sup> Semester                                                                                                                    | 19-02-2018 to 21-02-2018 |
| 2.          | Commencement of classes for B.Tech. 8 <sup>th</sup> Semester                                                                                                     | 22-02-2018               |
| 3.          | Registration with late fee B.Tech. 8 <sup>th</sup> Semester                                                                                                      | 22-02-2018 to 26-02-2018 |
| 4.          | Registration B.Tech. 2 <sup>nd</sup> , 4 <sup>th</sup> and 6 <sup>th</sup> Semesters, M.Tech./M.Sc. 2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D.                | 26-02-2018 to 28-02-2018 |
| 5.          | Registration with late fee B.Tech. 2 <sup>nd</sup> , 4 <sup>th</sup> and 6 <sup>th</sup> Semesters, M.Tech./M.Sc. 2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D.  | 01-03-2018 to 05-03-2018 |
| 6.          | Commencement of classes for B.Tech. 2 <sup>nd</sup> , 4 <sup>th</sup> and 6 <sup>th</sup> Semesters, M.Tech./M.Sc. 2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D. | 01-03-2018               |
| 7.          | Mid-Term exam B.Tech. 8 <sup>th</sup> Semester                                                                                                                   | 16-04-2018 to 21-04-2018 |
| 8.          | Mid-Term exam B.Tech. 2 <sup>nd</sup> , 4 <sup>th</sup> and 6 <sup>th</sup> Semesters, M.Tech./M.Sc. 2 <sup>nd</sup> and 4 <sup>th</sup> and Ph.D.               | 23-04-2018 to 28-04-2018 |
| 9.          | Alumni Meet-2018                                                                                                                                                 | 28-04-2018 to 29-04-2018 |
| 10.         | Extra Curricular Activities                                                                                                                                      | 28-04-2018 to 30-04-2018 |
| 11.         | Annual Day                                                                                                                                                       | 01-05-2018               |
| 12.         | Practical Examinations                                                                                                                                           | Last week of May         |
| 13.         | Advertisement for Ph.D. admissions                                                                                                                               | Last week of May         |
| 14.         | End Semester Examination B.Tech. Semester                                                                                                                        | From 28-05-2018          |
| 15.         | B.Tech. Project Viva-voce Examination                                                                                                                            | 11-06-2018 to 12-06-2018 |
| 16.         | End Semester Examination B.Tech. 2 <sup>nd</sup> , 4 <sup>th</sup> and 6 <sup>th</sup> Semesters, M.Tech./M.Sc. 2 <sup>nd</sup> & 4 <sup>th</sup> and Ph.D.      | From 19-06-2018          |

**Table B.2.2.1c: Academic Calendar Year 2018 (Spring Session)**

|     |                                              |                          |
|-----|----------------------------------------------|--------------------------|
| 1.  | Registration for U.G., P.G. & Ph.D.          | 23-07-2018 to 25-07-2018 |
| 2.  | Registration with late fee @Rs 400/= per day | Upto 30-07-2018          |
| 3.  | Commencement of classes                      | 6-07-2018                |
| 4.  | Extracurricular activity                     | 07-09-2018 to 15-09-2018 |
| 5.  | Midterm examination                          | 10-09-2018 to 15-09-2018 |
| 6.  | Convocation                                  | 22-09-2018               |
| 7.  | Alumni meet Delhi chapter                    | 29-09-2018 to 30-09-2018 |
| 8.  | Tech fest/ECA                                | 13-10-2018 to 15-10-2018 |
| 9.  | National innovation day                      | 15-10-2018               |
| 10. | Practical examination                        | 1st week of November     |
| 11. | National Entrepreneur day                    | 09-11-2018               |
| 12. | End semester examination                     | From 12-11-2018          |
| 13. | Supplementary examinations for even semester | From 26-11-2018          |
| 14. | Winter vacation for students                 | 10-12-2018               |

**Table B.2.2.1d: Academic Calendar for the Calendar Year 2018 (Autumn)**

| <b>Autumn-2017</b> |                                                                                                     |                                                           |            |
|--------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------|------------|
| S.No.              | Activity                                                                                            | Date                                                      |            |
|                    |                                                                                                     | From                                                      | To         |
| 01.                | <b>Registration</b> for U.G, P.G &Ph.D.                                                             | 26-07-2017                                                | 28-07-2017 |
|                    | Late Registrationfor U.G, P.G &Ph.D.                                                                | 31-07-2017                                                | 01-08-2017 |
| 02.                | <b>Commencement of classes</b>                                                                      | 31-07-2017                                                |            |
| 03.                | <b>Tech. Fest</b>                                                                                   | 04-08-2017                                                | 06-08-2017 |
| 04.                | Fresher's Orientation day                                                                           | 3 <sup>rd</sup> week of August                            |            |
| 05.                | <b>Minor-1 Examination for U.G, P.G &amp;Ph.D.</b>                                                  | 04-09-2017                                                | 06-09-2017 |
| 06.                | <b>Extra Curriculum Activities</b>                                                                  | 07-09-2017                                                | 10-09-2017 |
| 07.                | <b>Mid-Term Examination</b><br>(To be conducted instead of Minor-1 & Minor-2 if approved by Senate) | 18-09-2017                                                | 20-09-2017 |
| 08.                | <b>Convocation</b>                                                                                  | Last week of September to 1 <sup>st</sup> week of October |            |
| 09.                | <b>Minor-2</b> Examination for U.G, P.G &Ph.D.                                                      | 04-10-2017                                                | 06-10-2017 |
| 10.                | <b>Major Examination</b> for U.G, P.G &Ph.D.                                                        | 06-11-2017                                                |            |
| 11.                | <b>Supplementary Examinations</b><br>for even Semester                                              | 20-11-2017                                                |            |
| 12.                | <b>Winter Vacation</b> for Students                                                                 | 01-12-2017                                                |            |

**Table B.2.2.1e: Academic Calendar for the Calendar Year 2017 (Autumn)**

## **B. Maintenance of Course files**

### **The implementation details:**

The department is having a systematic procedure for improving the Teaching learning process which shows step by step improvement in quality of teaching and hence an improvement in the students' performance. The quality of the teaching and learning process is dynamic to improve time to time depending upon the requirements of the students and to need the set PEOs, PSOs and POs.

- All the faculty members have to undergo FDP, FIP, FOP programmes once in a year to adopt by the internal experts or also the external experts to be aware of change pedagogy to assure that quality of teaching.
- Subject allotment for each subject will take place at least two months in advance as per the faculty choice so that the faculty members can get enough time to plan their pedagogical approach for the subject.

- c) Faculty who is handling the course will prepare the detailed lecture plan according to the academic calendar of the Institution. The lecture plan incorporates the details of the topics covered in each lecture, syllabus to be cover before each internal exam, number of tutorials to be conducted and, total number of lecture hours needed for completing course.
- d) Course monitoring committee (CMC) meetings are arranged periodically to monitor the coverage of syllabus, quality of teaching in the respective semesters and suitable corrective measures are adopted to complete the syllabus within the stipulated time.
- e) Once in a month Dean, academics submit a report on the maintaince of quality of the teaching.

## NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR

### DEPARTMENT OF ELECTRICAL ENGINEERING

6<sup>Th</sup> Semester (3<sup>rd</sup> Year)

**Course name: Power System-II**

**Course code: ELE- 601**

### **COURSE DELIVERY PLAN**

| Sess. No. | CO  | Topic (s)                                                                                                                | Teaching-Learning Methods | Evaluation Components                       |
|-----------|-----|--------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------------------------|
| 1         | CO1 | Single line diagram, impedance and reactance diagram of a system                                                         | Questioning /Discussion   | Comprehensive, Test – 1 & END semester exam |
| 2         |     | per unit calculations, per unit representation of a power system.                                                        | Questioning /Discussion   | Comprehensive, Test – 1 & END semester exam |
| 3         | CO2 | Faults, types of faults, symmetrical 3-phase balanced faults – calculation of fault currents, current limiting reactors. | Questioning /Discussion   | Comprehensive, Test – 1 & END semester exam |
| 4         |     | Symmetrical components, sequence impedances, sequence networks, unsymmetrical faults –single line to ground,             | Questioning /Discussion   | Comprehensive, Test – 1 & END semester exam |
| 5         |     | line-to-line, double line to ground faults on unloaded alternators and on power systems.                                 | Questioning /Discussion   | Comprehensive, Test – 1 & END semester exam |
| 6         |     | Generation of over-voltages in a power system, lightning phenomena                                                       | Questioning /Discussion   | Comprehensive & END semester exam           |

|    |     |                                                                                                     |                         |                                   |
|----|-----|-----------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------|
| 7  | CO3 | lightning surges, switching surges-interruption of short circuits and switching operations          | Questioning /Discussion | Comprehensive & END semester exam |
| 8  |     | switching surges – interruption of capacitive circuits                                              | Questioning /Discussion | Comprehensive & END semester exam |
| 9  |     | resonance over voltages, protection of power system components against over voltages – ground wires | Questioning /Discussion | Comprehensive & END semester exam |
| 10 |     | lightning arrestors. Concept of insulation coordination                                             | Questioning /Discussion | Comprehensive & END semester exam |
| 11 |     | Basic impulse insulation level, standard impulse test wave,                                         | Questioning /Discussion | Comprehensive & END semester exam |
| 12 | CO4 | volt-time curve, location and rating of lightning arrestors                                         | Questioning /Discussion | Comprehensive & END semester exam |
| 13 |     | Traveling waves on transmission lines, open-end line                                                | Questioning /Discussion | Comprehensive & END semester exam |
| 14 |     | short-circuited line, line terminated through a resistance, line connected to a cable,              | Questioning /Discussion | Comprehensive & END semester exam |
| 15 |     | reflection and refraction at a T-junction, line terminated through a capacitance                    | Questioning /Discussion | Comprehensive & END semester exam |
| 16 |     | line terminated through an inductance                                                               | Questioning /Discussion | Comprehensive & END semester exam |
| 17 |     | Attenuation of traveling waves.                                                                     | Questioning /Discussion | Comprehensive & END semester exam |
| 18 | CO5 | Electrostatic and Electromagnetic effect                                                            | Questioning /Discussion | Comprehensive & END semester exam |
| 19 |     | Comparison of HVAC and HVDC transmission lines                                                      | Questioning /Discussion | Comprehensive & END semester exam |
| 20 |     | Thyristors (brief revision)                                                                         | Questioning /Discussion | Comprehensive & END semester exam |
| 21 |     | Basic converter and D.C system operation – rectification, inversion.                                | Questioning /Discussion | Comprehensive & END semester exam |
| 22 |     | Objective of FACTS.                                                                                 | Questioning /Discussion | Comprehensive & END semester exam |
| 23 |     | 3 Basic types of FACTS controllers.                                                                 | Questioning /Discussion | Comprehensive & END semester exam |
| 24 |     | Introduction to FACTS Devices.                                                                      | Questioning /Discussion | Comprehensive & END semester exam |

**Lesson Plan****Name of Faculty:** Dr Obbu Chandra Sekhar**Duration:** 55 Min.**Class:** IV th Semester**Total Lectures:** 44

| Les<br>son<br>no | Planned<br>date | Topic to be covered                                                                  | Actual date<br>of lesson<br>delivered | remarks |
|------------------|-----------------|--------------------------------------------------------------------------------------|---------------------------------------|---------|
| 1                | 06-03-2019      | Introduction about course handout Basics of EMF and MMF                              | 06-03-2019                            |         |
| 2                | 07-03-2019      | Lorentz force equation                                                               | 07-03-2019                            |         |
| 3                | 10-03-2019      | Energy balance equation                                                              | 10-03-2019                            |         |
| 4                | 11-03-2019      | Force & Torque in singly excited systems<br>Derivation of force equation with energy | 11-03-2019                            |         |
| 5                | 11-03-2019      | Force and Torque in multiply excited systems                                         | 11-03-2019                            |         |
| 6                | 13-03-2019      | Working principle & operation of DC Generator                                        | 13-03-2019                            |         |
| 7                | 14-03-2019      | Constructional details of DC Machines                                                | 14-03-2019                            |         |
| 8                | 18-03-2019      | EMF equation                                                                         | 18-03-2019                            |         |
| 9                | 18-03-2019      | Armature Winding -Lap winding                                                        | 18-03-2019                            |         |
| 10               | 20-03-2019      | Armature Winding- wave                                                               | 20-03-2019                            |         |
| 11               | 25-03-2019      | Armature reaction                                                                    | 25-03-2019                            |         |
| 12               | 25-03-2019      | Demagnetization and cross magnetization                                              | 25-03-2019                            |         |
| 13               | 27-03-2019      | Commutation Process                                                                  | 27-03-2019                            |         |
| 14               | 28-03-2019      | Problems on Armature reaction                                                        | 28-03-2019                            |         |
| 15               | 30-03-2019      | Types of generators based on excitation                                              | 30-03-2019                            |         |
| 16               | 01-04-2019      | Short shunt generator                                                                | 01-04-2019                            |         |
| 17               | 01-04-2019      | Problems on different types of DC generators                                         | 01-04-2019                            |         |
| 18               | 03-04-2019      | No load Characteristics of DC generator                                              | 03-04-2019                            |         |
| 19               | 04-04-2019      | Calculation of critical Field Resistance and Critical Speed from OCC                 | 04-04-2019                            |         |
| 20               | 06-04-2019      | Load Characteristics of Self Excited Generators                                      | 06-04-2019                            |         |
| 21               | 08-04-2019      | Characteristics of various types of generators, applications                         | 08-04-2019                            |         |
| 22               | 10-04-2019      | Parallel Operation of DC Generators                                                  | 10-04-2019                            |         |
| 23               | 11-04-2019      | D.C. Motors: Torque equation                                                         | 11-04-2019                            |         |
| 24               | 15-04-2019      | Characteristics of d.c. shunt, series and compound motors.                           | 15-04-2019                            |         |
| 25               | 18-04-2019      | Speed control of d.c. shunt and series motors                                        | 18-04-2019                            |         |
| 26               | 01-05-2019      | Problems Solving on Speed Control Methods                                            | 01-05-2019                            |         |
| 27               | 06-05-2019      | Starting methods of d.c. shunt motors                                                | 06-05-2019                            |         |
| 28               | 08-05-2019      | Principle and constructional Details of Transformers                                 | 08-05-2019                            |         |
| 30               | 09-05-2019      | operation of single phase transformers and emf equation                              | 09-05-2019                            |         |
| 31               | 13-05-2019      | Operation of single phase transformer on No-load and equivalent circuit              | 13-05-2019                            |         |

|    |            |                                                                                                  |            |  |
|----|------------|--------------------------------------------------------------------------------------------------|------------|--|
| 32 | 13-05-2019 | Operation of single phase transformer on load and equivalent circuit                             | 13-05-2019 |  |
| 33 | 15-05-2019 | Testing- Open & short circuit tests                                                              | 15-05-2019 |  |
| 34 | 16-05-2019 | Problems on OC and SC Tests                                                                      | 16-05-2019 |  |
| 35 | 20-05-2019 | Voltage Regulation of Transformer                                                                | 20-05-2019 |  |
| 36 | 20-05-2019 | Transformers losses and Efficiency calculations                                                  | 20-05-2019 |  |
| 37 | 22-05-2019 | Separation of hysteresis and eddy current losses.                                                | 22-05-2019 |  |
| 38 | 23-05-2019 | Parallel operation of single phase transformers                                                  | 23-05-2019 |  |
| 39 | 27-05-2019 | Autotransformers                                                                                 | 27-05-2019 |  |
| 40 | 27-05-2019 | Construction, various types of connection and their comparative features of 3 phase transformers | 27-05-2019 |  |
| 42 | 29-05-2019 | Phase conversion-Scott connection                                                                | 29-05-2019 |  |
| 43 | 30-05-2019 | No load and on load tap changing of transformers, Cooling methods of transformers                | 30-05-2019 |  |
| 44 | 03-06-2019 | Problems on voltage regulation and efficiency                                                    | 03-06-2019 |  |

### Reference Books:

1. Electric Machinery Fitzgerald, Kingslay, Umans Tata McGraw-Hill
2. Electric Machinery Fundamentals Chapman McGraw-Hill Higher Education
3. Electric Machines Nagrath and Kothari Tata McGraw-Hill
4. Electric Machinery and Transformer Guru, Hiziroglu Oxford University press
5. Electric Machinery P.S.Bimbhra Khanna Publishers
6. Basic Electric Machines Vincent Deltoro Prentice Hall

### C. Use of various instructional methods and pedagogical initiatives:

The students acquire critical mind towards basic sciences and engineering, effective learning of curricular courses, acquiring knowledge on latest topics and technologies, team work through project work, and get habituated to self-learning and continuous learning.

#### 1. Exclusive Notes preparation for subjects:

Exclusive notes on many subjects of Electrical Engineering has been prepared by the faculty members of this department and distributed to the students to enable the students to learn the subjects better. These notes contain clear description of the concepts, explanation of the content covered in the classes, typical questions, and critical analysis of problems with clearly depicted solutions. These notes serve as a helping tool for them and serve to enhance their performance in exams.

## **2. Exclusive Videos collection and display for subjects:**

Exclusive videos have been collected and compiled by the faculty in different subjects for displaying them to students during discussions in class rooms. These videos enhance their understanding abilities and create more interest towards learning the subjects.

## **3. Exclusive NPTEL facility for students for listening to special lectures:**

- An exclusive audio-visual facility has been developed and is being maintained to register in NPTEL courses.
- This facility is available in the library and departmental laboratory.
- This facility is being used by the faculty and students and enables them to register to online courses in addition to the regular class room teaching/learning.
- Faculty and students upgrade their knowledge through these courses, and obtain additional certification.
- The exercise is to gradually move the students to self-learning methods.

## **4. Improved Instruction Methodology in Laboratories:**

Special focus is given in instruction methodology in laboratories where the emphasis is more on student's ability to individually gain in-depth knowledge while conducting the experiments. In this regard, the following procedures are followed:

1. Laboratory manuals are prepared giving the details of the equipment, procedure, specifications, etc., along with a good number of objective questions. The students have to complete the calculations, graphs and also summarise their observations of the experiment in the form of results and discussions. All the details are then written meticulously in the respective laboratory records.
2. The students are required to study the experiment and know the procedure in the manual before conduct of the experiment. The group of students is also encouraged to discuss among themselves during this study and be ready to answer any questions raised by the faculty in this regard.

It has been observed that this method of instruction made students prepare and understand the correlation of the experiments with the related theory and also made them confident on conducting the experiment on their own.

## **5. Seminars and Projects:**

Through Seminars and projects, students are encouraged to innovate and come up with new ideas.

### **Seminars:**

- Each student has to give a separate seminar, one in the 7<sup>th</sup> semester.
- The discussion among students after the seminar presentation is encouraged.
- Student seminars are attended by the faculty for giving a critical assessment.

**Projects:**

- Students are grouped into batch of 2-3 in each batch for projects to be carried in the 8<sup>th</sup> semester.
- Student projects are selected based on the ideas of the students, relevance of the subject, and the ability of the batches.
- Faculty assist students in formulating their ideas, design of components and development.
- Students are encouraged to carry out in-house fabrication as a part of their project work and some of these successful projects form a part of the experiments beyond curriculum.
- Novel projects are provided opportunity to participate in the competitions at the regional and national level.

**6. ICT usage:**

ICT is a potentially powerful tool for offering educational opportunities. It is difficult and maybe even impossible to imagine future learning environments that are not supported, in one way or another, by Information and Communication Technologies (ICT). Students are provided with knowledge and proficiency in the usage of simulation software like MATLAB, PSCAD and MULTISIM. These software's are available in the department and students use it for various analysis purpose. Special training is offered to the students in the lab on regular basis.

**7. Focused group study:**

- Students are divided into specific groups and are assigned specific topics related to curricular learning.
- These groups study the topics in detail through library books, internet, and library journals. Thereafter, the topics are discussed by individual groups in the class and the teacher further guides them about the specific topic.
- The group's composition and the group discussion should be carefully planned to create a nonthreatening environment, so that participants feel free to talk openly and give honest opinions.
- Since participants are actively encouraged to not only express their own opinions, but also respond to other members and questions posed by the leader, focus groups offer a depth and variety to the discussion.
- Additionally, because focus groups are structured and directed, but also expressive, they can yield a lot of information in a relatively short time.

**8. Problem based learning:**

Student-directed learning Attempts are made to create excitement in the classroom through posing problems related to the topic and finding solutions thereby presenting and learning the topic which insures students do more than listening through active participation.

For example, question may be presented for the students like 'Design solar power plant for your home?' Such question compels students to take active participation in the class discussion and creates excitement among them.

### 9. Developing lifelong learning attitudes

The students are introduced and gradually pushed into adopting lifelong learning through the following initiatives and practices.

- Mandatory class hours for library-all students have to attend and spend time in library one hour in a week.
- The students with regular and frequent visits to the library are encouraged to gifts and rewards.
- Students are encouraged to prepare technical briefs on the contents covered in the journals.
- Students are encouraged to go through technical websites in the internet to learn about emerging issues and technologies.
- Students are encouraged to participate in technical competitions and hackthons being offered by the various agencies.
- Regular lectures are organized by the industry experts and from research organizations to make students aware of the latest developments and technologies.

Through the above methods faculty encourages the students into gradual self motivated study and into continuous learning.

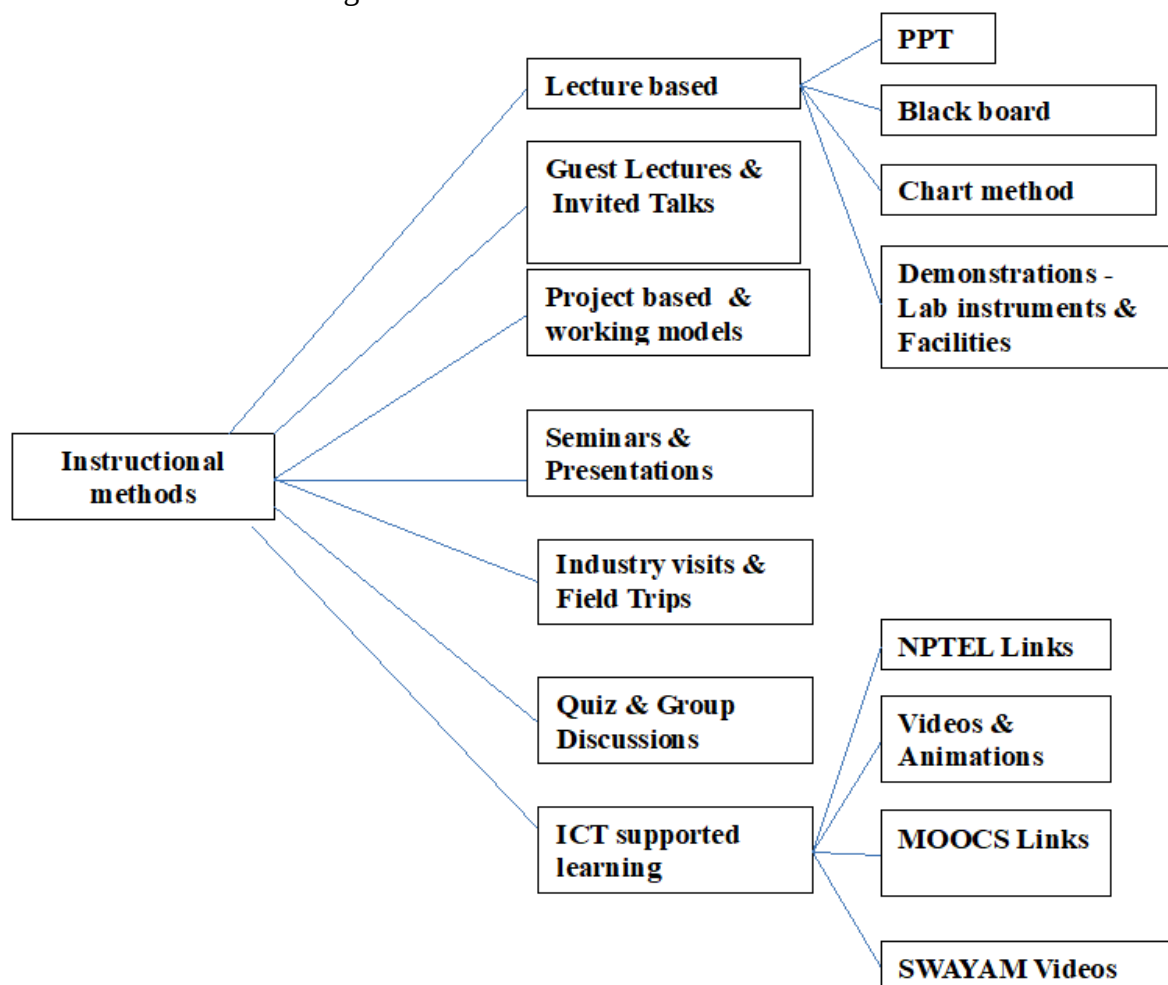


Figure: Strategies used to make the teaching more effective

## D. Methodologies to support weak students and encourage bright students:

### Encouraging Bright Students:

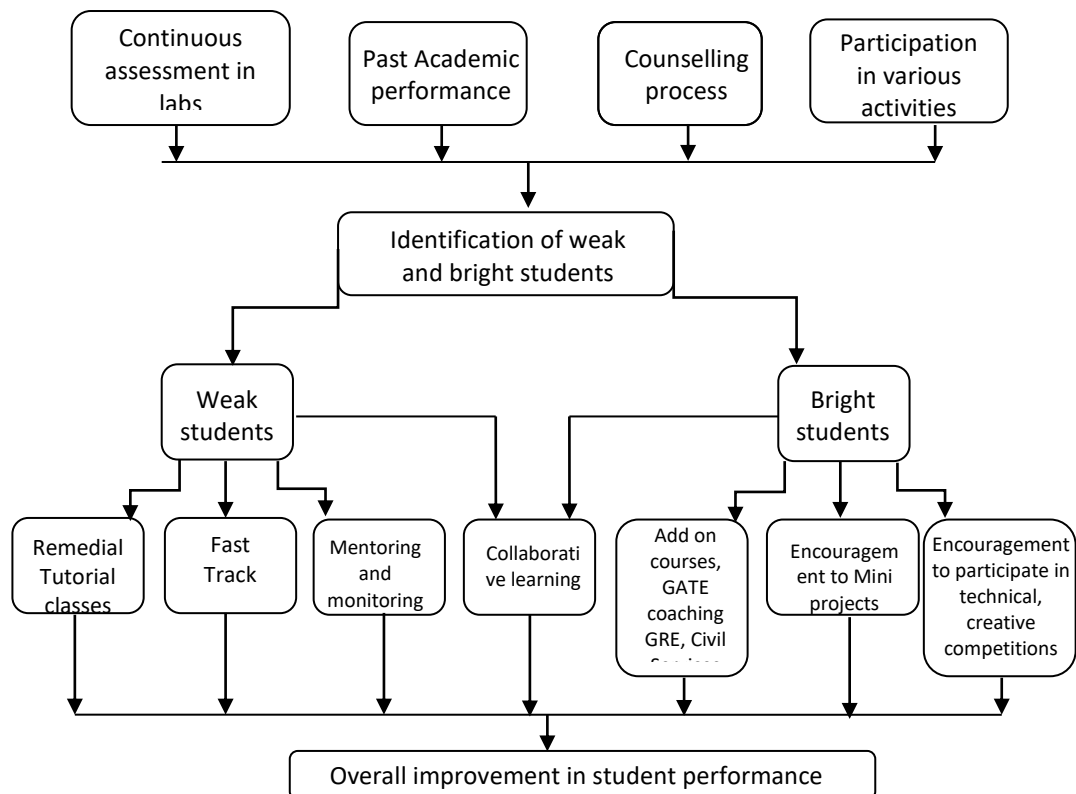
- (a) The bright students are encouraged by giving the mentoring of other student (Slow learners).
- (b) The bright students are given extra assignments in both theory and laboratory
- (c) The bright students are encouraged to the competitive exams like GATE, GRE, TOFEL, and CIVILS by giving the suitable material and also special training.

### Assisting Weak Students:

- (a) They are supported by the student mentoring and faculty mentoring, extra classes, remedial class are conducted.
- (b) Behavior problems are corrected through counselling system.
- (c) During the lab, special assistance given by other bright students.

### Weak students:

The weak students are analyzed based on their performance analysis in MID term exams, classroom interactions and participation in seminars and quiz.



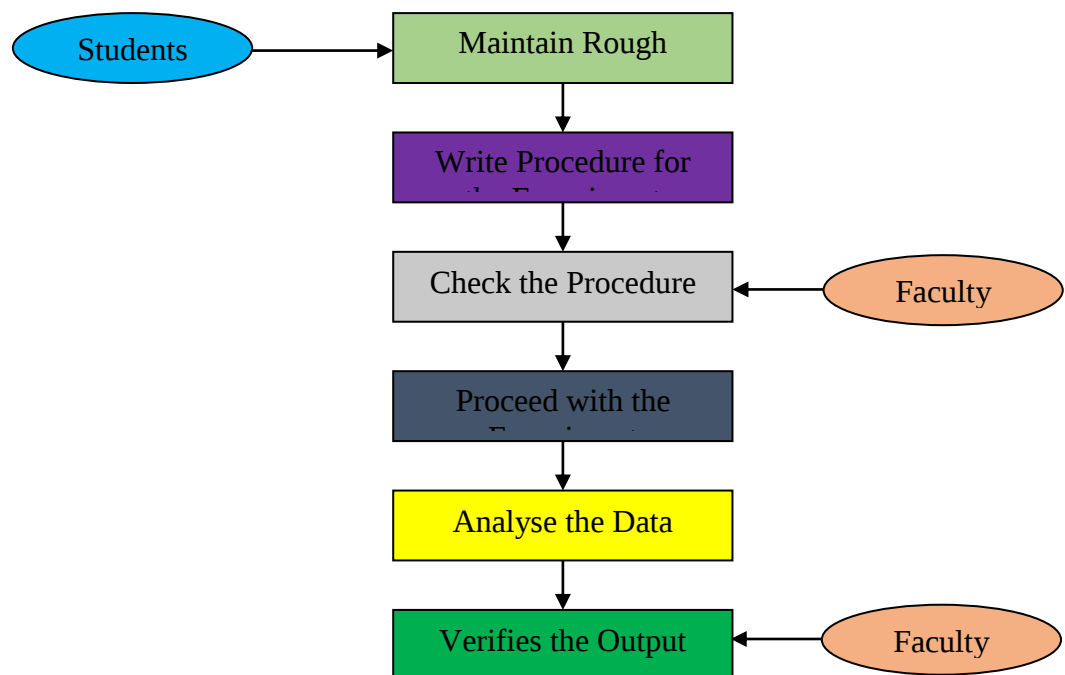
**Figure: Process to identify and monitor weak and bright students**

**E. Conduction of Experiments:**

- (a) Respective faculty who handling laboratory courses will prepare the Lab manuals and circulated to the among the students well in advance.
- (b) Separate O/C lab (Faculty In charge) is tasked the responsibility of maintenance and upkeep of all the equipments and laboratory, and to plan augmentation of labs in line with the course contents.
- (c) There is a system to display the number of experiments performed by every student.
- (d) The projects are given for the teams of the students to develop skill one side and team spirit other-side.

**Continuous assessment in the laboratory**

- Each student should maintain a rough record to record the details of work done in each laboratory session.
- The students are directed to write the step by step procedure to achieve a solution for the given experiment.
- The faculty-in-charge will check the procedure and then students can proceed with doing the experiment.
- Students should record the observations in the rough record while doing the experiment
- Students may also analyze the data to plot graph or other related work.
- The final output will be verified by the faculty-in-charge.
- Students should add the details of the experiments done in the laboratory to the prescribed record book.



**Figure : Process for conduct of experiments, record of observations and analysis of data**

- The Laboratories are evaluated by the faculties for 100 marks based on their performance during the semester, internal test and record submission.
- The distribution of marks for laboratory subjects has been reflected in Table 2.2d.

| Continuous Assessment | Major Examination | Total | Grade |
|-----------------------|-------------------|-------|-------|
| 40                    | 60                | 100   | ..... |

**Table B.2.2.1h: Distribution of Marks for Laboratory Subjects**

#### **F. Student feedback of teaching-learning process and actions are taken**

- Student feedback on teaching-learning process is taken once in a semester. All the students are required to fill a feedback-form in offline apprising the faculty on a scale of 1 (low) through 5 (high).
- Lecture classes are monitored by Dean Academics, HoD and senior professors of the Department. The teaching-learning process is improved based on their constructive feedback.
- HoD Counsel the faculty members who secured feedback below 70% and motivate them to improve their skills and abilities and mentored by the senior faculty members.
- If required training/orientation programs are conducted by professional experts to master the skills of the faculty members in the nuances of teaching, thus improving the efficiency of the teaching-learning process.
- Every year Faculty Orientation Programs (FOP) regularly conducted for newly recruited faculty for improving the efficiency of the teaching process.

#### **Impact Analysis:**

- (a) The quality of teaching is very much exhibited in terms of attaining POs, PEOs to the extent of 70-80 %.
- (b) The academic outcome is more than 85% students are completing their course with in the stipulated time of four years.
- (c) Because of the extra support of slow learners the pass percentage is continuously increasing and the number of backlogs students is decreasing.

#### **A. Impact Analysis**

#### **COURSE APPRAISAL/FEEDBACK FORM**

**Course No & Title**

**Date:**

**Instructor's Name**

**Sem:**

**Please Tick In The Appropriate Box**

| S. No. | Course Organisation                                    | Range                  | 5 | 4 | 3 | 2 | 1 |             |
|--------|--------------------------------------------------------|------------------------|---|---|---|---|---|-------------|
| 1      | Were the objectives and course plan clearly specified? | Very clearly excellent |   |   |   |   |   | Very Poorly |
| 2      | Was the course coverage and depth adequate?            | Excellent              |   |   |   |   |   | Very poor   |
| 3      | Did the topics provide any new knowledge?              | Mostly                 |   |   |   |   |   | Hardly      |
| 4      | Was the prescribed study material readily              | Very readily           |   |   |   |   |   | Not         |

|    |                                                                                         |              |  |  |  |  |  |                  |
|----|-----------------------------------------------------------------------------------------|--------------|--|--|--|--|--|------------------|
|    | available?                                                                              |              |  |  |  |  |  | available at all |
|    | <b>Presentation and interaction</b>                                                     |              |  |  |  |  |  |                  |
| 5  | How were the lectures in terms of clarity and presentation of the fundamental concepts? | Excellent    |  |  |  |  |  | Poor             |
| 6  | Rate the audibility and articulation of the instructors or 2al presentation             | Excellent    |  |  |  |  |  | Poor             |
| 7  | Did the instructor encourage think logically and objectively?                           | Very much    |  |  |  |  |  | Never            |
| 8  | Was the instructor's response to the questions asked in the class satisfactory?         | Very much    |  |  |  |  |  | Not at all       |
| 9  | Rate the instructor's attitude towards teaching of this course.                         | Enthusiastic |  |  |  |  |  | Indifferent      |
| 10 | Were the classes held regularly and on time?                                            | Always       |  |  |  |  |  | Never            |
| 11 | Rate the overall quality of teaching in this course                                     | Outstanding  |  |  |  |  |  | Poor             |
|    | <b>Evaluation</b>                                                                       |              |  |  |  |  |  |                  |
| 12 | Did the examinations reflect the courses plan?                                          | Very closely |  |  |  |  |  | Poorly           |
| 13 | Were the examinations of appropriate level and length?                                  | Always       |  |  |  |  |  | Rarely           |
| 14 | Were the answer script promptly checked and returned?                                   | Always       |  |  |  |  |  | Rarely           |
| 15 | Was the grading fair and transparent?                                                   | Mostly       |  |  |  |  |  | Rarely           |
| 16 | Did the midterm evaluation and feedback improve the understanding of this course?       | Always       |  |  |  |  |  | Rarely           |

**NATIONAL INSTITUTE OF TECHNOLOGY, SRINAGAR (J&K)**  
**DEPARTMENT OF CHEMICAL ENGINEERING**  
**Course Exit Survey**

Name of the Program:

**B.Tech : Electrical Engineering**

Academic Year

Code and Title of the Course:

Semester:

Name of the Course Teacher:

**Note:** Please rate the quality of course on course curriculum, course organization, teaching learning process, quality of learning material, assignments, progressive assessments, performance of faculty members and course outcomes. Rate each applicable criteria by putting points as mentioned in legend.

| S. No. | Criteria                            | Rating   |             |          |
|--------|-------------------------------------|----------|-------------|----------|
|        |                                     | Good (3) | Average (2) | Poor (1) |
| 1      | <b>Course Curriculum</b>            |          |             |          |
|        | Course Outcome explained            |          |             |          |
|        | Depth and breadth of course content |          |             |          |
|        | Importance of course explained      |          |             |          |
| 2      | <b>Course Organization</b>          |          |             |          |
|        | Ease of learning                    |          |             |          |

|          |                                                                                           |  |  |  |
|----------|-------------------------------------------------------------------------------------------|--|--|--|
|          | Logically sequenced                                                                       |  |  |  |
|          | Linked with previous and subsequent courses                                               |  |  |  |
| <b>3</b> | <b>Teaching Learning Process</b>                                                          |  |  |  |
|          | Introduction of topic                                                                     |  |  |  |
|          | Development of content                                                                    |  |  |  |
|          | Opportunity of participation                                                              |  |  |  |
|          | Quality of questions asked by teacher                                                     |  |  |  |
|          | Variety of teaching materials                                                             |  |  |  |
|          | Use of teaching aids                                                                      |  |  |  |
|          | Summarization of learning                                                                 |  |  |  |
| <b>4</b> | <b>Quality of Learning Material</b>                                                       |  |  |  |
|          | Relevance to course outcomes                                                              |  |  |  |
|          | Coverage                                                                                  |  |  |  |
|          | Comprehensible                                                                            |  |  |  |
|          | Variety in learning material such as handouts, case study, papers, workbook, manual, ppts |  |  |  |
|          | Reference material                                                                        |  |  |  |
| <b>5</b> | <b>Assignments</b>                                                                        |  |  |  |
|          | Relevance to course                                                                       |  |  |  |
|          | Feedback provided on assignments                                                          |  |  |  |
| <b>6</b> | <b>Progressive Assessment</b>                                                             |  |  |  |
|          | Relevance of progressive test                                                             |  |  |  |
|          | Feedback provided on assignments                                                          |  |  |  |
| <b>7</b> | <b>Performance of Faculty members</b>                                                     |  |  |  |
|          | Effective communication                                                                   |  |  |  |
|          | Guidance and feedback                                                                     |  |  |  |
|          | Time management                                                                           |  |  |  |
| <b>8</b> | <b>Course Outcome Assessment</b>                                                          |  |  |  |
|          | <b>CO1:</b>                                                                               |  |  |  |
|          | <b>CO2:</b>                                                                               |  |  |  |
|          | <b>CO3:</b>                                                                               |  |  |  |
|          | <b>CO4:</b>                                                                               |  |  |  |
|          | <b>CO5:</b>                                                                               |  |  |  |

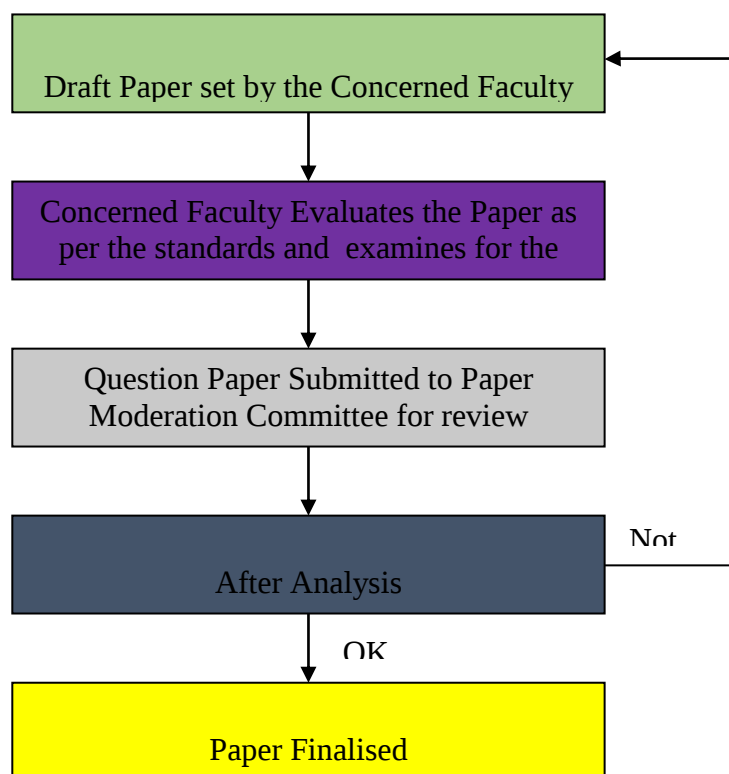
- The quality of teaching exhibited in terms of attaining POs, PSOs to the extent of 70-80 % in most of the courses.
- When the academic outcome is more than 75%, most students have achieved their course outcomes within the stipulated time of four years.
- Because of the extra support given to the slow learners and the weak students, the pass percentage is continuously increasing and the number of backlogs students is decreasing.

### 2.2.2 Quality of End Semester Examination, Internal Semester Question Papers, Assignments and Evaluation (15)

*(Mention the initiatives, implementation details and analysis of learning levels related to quality of semester question papers, assignments and evaluation)*

#### A. Process to ensure the quality of internal semester question papers:

- All tests are conducted in strict adherence to the academic calendar.
  - The question papers for each subject are set in such a way that it maps to the Course Outcomes of the respective subject.
  - The question paper will be verified by the Head of the Department and may accept with or without modifications.
  - The questions asked in each subject are categorized to knowledge, comprehension, application, analysis, evaluation and synthesis level.
  - All course outcomes will be achieved through the tests conducted in each semester.
- CO Coverage for Midterm Exams
  - CO Coverage for End term Exams
  - CO Attainment Calculation.



**Figure : Process to Ensure the Quality of Internal Semester Question Papers**  
**Paper Moderation Committee includes following members:**

- 1) Head of the Department
- 2) Course Coordinator
- 3) Subject Expert

**B. To ensure the quality of the internal semester question papers the following process is adopted:**

- Regular midterm exams are held in strict adherence to the academic calendar of the institute.
- The question papers are set in such a way that the COs maps the questions asked.
- The question papers are examined and verified by the HOD to ensure the standard of the paper and ensures that the COs of the course are covered. The questions papers are modified if HOD is not satisfied with standard requirements of the question paper.
- The questions asked are well balanced to ensure that all the components such as knowledge, comprehension, application, analysis etc are encompassed.

**C. To ensure the quality of the assignments following procedure is adopted:**

- At least two assignments are given before midterm and after the midterm ( before the commencement of the major exam)
- The assignments are designed to map the COs of the course.
- The assignments are designed to cover both theoretical and numerical portion of the course.
- The assignments cover knowledge, comprehension, application, analysis etc. of the course.
- The assignments may have questions designed by the faculty or an open book type.
- The evaluated assignments are returned to the students with the remarks of faculty so as to point out the mistakes.
- The marks earned by the students are displayed on the notice board for transparency so that the students come to know about the marks before final submission to the controller of examinations.

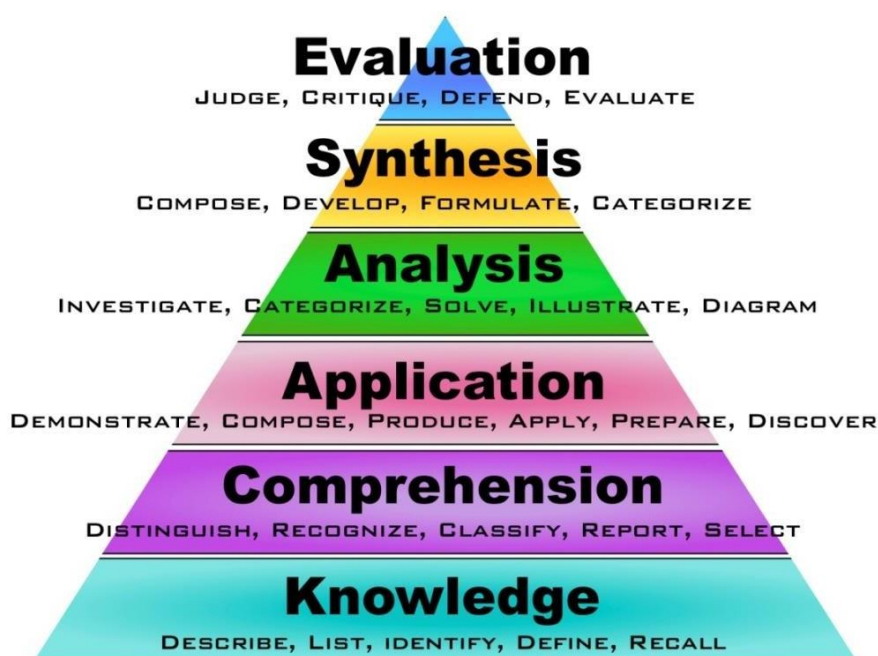
**D. To ensure the quality of evaluation following procedure is place in the department:**

- The scheme of evaluation and solution to the problems in the question papers are prepared by the respective faculty in advance.
- The CO coverage and the marks allotted are recorded by the faculty.
- The evaluated answer books are returned by the faculty to the students to ensure the transparency so that the students come to know about the marks before final submission to the controller of examinations.
- Student's feedback is received by the faculty regarding the evaluation of each question.
- The students are encouraged to discuss any doubt or discrepancy regarding the evaluation.
- The marks of the students are forwarded only when the students are satisfied with evaluation.

- It is the statutory procedure of the institute to show the evaluated answer books to the students , once the students give in writing the that they have seen the answer books . The marks are forwarded to the concerned quarters.

**E. Process to ensure questions from outcomes/learning level perspective.**

- For each subject, a tentative question list is prepared according to the COs.
- While setting the question paper, previous institute exam papers of at least three years are taken into consideration to avoid repetition of questions.
- While setting a question paper an attempt is made to follow Bloom's taxonomy. The questions are prepared according to the level of toughness (viz., analyzing the problems, implementation of modern tools, formulating the problems etc).



*Figure : Bloom's Taxonomy Pyramid*

- **The questions asked are of three categories:**
  - 1) Approximately one third of the questions are of elementary level and can be answered by an average student, which require fundamentals of the course.
  - 2) Approximate one third of the questions need analysis and use of content covered as per syllabus.
  - 3) Remaining one third of the questions are based on advanced level. The solution of these questions/problems requires certain amount of critical thinking, analysis and knowledge.

**Department of Electrical Engineering**  
**National Institute of Technology, Srinagar**  
**MAJOR EXAMINATION**

**Date: 18-06-2019****Course Title: Electric Machines-1****Subject Code: ELE- 401****Time: 3 Hours****60****Semester: 4<sup>th</sup> B.Tech (EE)****Credits: 04****Max Marks:****Answer any four Questions**

CO1: Apply the basic principles of electromechanical energy conversion to Electrical Machines.

CO2: Analyze operating characteristics of various types of DC Generators.

CO3: Identify various speed control methods of DC Motor and evaluate this performance.

CO4: Analyze the performance of Transformers and selecting it for particular application.

|             |              |                 |
|-------------|--------------|-----------------|
| <b>CO:1</b> | <b>BTL:1</b> | <b>15 Marks</b> |
|-------------|--------------|-----------------|

1. a) Distinguish between lap and wave windings **(5 Marks)**  
 b) Build a diagram of DC Machine and label the component parts. Name the material used for each component part **(5 Marks)**  
 c) The following information is given for a 300KW, 600V, Long-shunt compound generator: Shunt field resistance =  $75\Omega$ , armature resistance including brush resistance =  $0.03\Omega$ , commutating field winding resistance =  $0.011\Omega$ , series field resistance =  $0.012\Omega$ . When the machine is delivering full load, analyze the voltage generated by the armature. **(5 Marks)**

|             |              |                 |
|-------------|--------------|-----------------|
| <b>CO:2</b> | <b>BTL:2</b> | <b>15 Marks</b> |
|-------------|--------------|-----------------|

2. a) Write about “build-up of EMF” in self-excited generator. Mention the reasons for failure of “voltage-buildup.” **(4 Marks)**  
 b) In a certain sub-station, there are 5 d.c shunt generators in parallel, each having an armature resistance of 0.1 ohms, running at the same speed and excited to give equal induced e.m.f.s. Each generator supplies an equal share of a total load of 250kw at a terminal voltage of 500V into a load of fixed resistance. If the field current of one generator is raised by 4% , the others remaining unchanged, calculate the power output of each machine and their terminal voltages under these conditions. Assume that the speed remains constant and flux is proportional to field current. **(7.5 Marks)**  
 c) Draw the external characteristics of series, shunt and compound generator in the same plot and compare them? **(3.5 Marks)**

|             |              |                 |
|-------------|--------------|-----------------|
| <b>CO:3</b> | <b>BTL:1</b> | <b>15 Marks</b> |
|-------------|--------------|-----------------|

3. a) Draw the three point starter and need of starter and explain the working of three point of starter **(5 Marks)**  
 b) Illustrate any two methods of speed control of DC shunt motor. **(5 Marks)**  
 c) A 230 V, D.C. Machine has  $R_a = 0.3\Omega$  and  $R_{sh} = 160\Omega$  respectively. It is running as a motor on NO LOAD at 1000 RPM taking an armature current of 3.3 A at rated voltage. When the motor is run on FULL LOAD at rated voltage, the line current has a value of 40 Amps. Calculate the speed and torque developed for this condition, assuming that armature reaction weakens the no load flux by 4%. **(5 Marks)**

|      |       |          |
|------|-------|----------|
| CO:4 | BTL:2 | 15 Marks |
|------|-------|----------|

4. a) List the condition that must be fulfilled before two transformers can be operated successfully in parallel? **(5 Marks)**
- b) Derive an expression for induced e.m.f. in a transformer in terms of frequency, the maximum value of flux and the number of turns on the windings **(2.5Marks)**
- c) The following readings were obtained from O.C. and S.C. tests on 8 kVA 400/120V, 50 – Hz transformer.  
 O.C. Test: (Low voltage side): 120 V; 4 A; 75 W.  
 S.C. Test: (High voltage side): 9.5 V; 20 A; 110W  
 Obtain i) The equivalent circuit (approximate) referred to high voltage and low voltage sides,  
 ii) Voltage regulation and efficiency for 0.8 lagging power factor load, and  
 iii) The efficiency at half full – load and 0.8 power factor load. **(7.5 Marks)**

|      |       |          |
|------|-------|----------|
| CO:4 | BTL:2 | 15 Marks |
|------|-------|----------|

5. a) Draw the vector diagram of a power transformer under full – load condition **(4 Marks)**
- b) A 5 KVA, single – Phase transformer has a core loss of 40 watts and full load ohmic loss of 100 watts. The daily variation of the load on the transformer is as follows:
- |                |                  |
|----------------|------------------|
| 7 A.M to 1 P.M | 3 kw at p.f. 0.6 |
| 1 P.M to 6 P.M | 2 kw at p.f. 0.8 |
| 6 P.M to 1A.M  | 6 kw at p.f. 0.9 |
| 1 A.M to 7 A.M | No load.         |
- Determine the all day efficiency of the transformer. **(6 Marks)**
- c) Sketch the speed- torque characteristics of dc shunt, series and cumulative compound motors in one figure and comment on the application and nature of characteristics. **(5 Marks)**

**Evaluation process: course work****Evaluation Process- Class test/ mid-term test schedules and procedures for systematic evaluation, internal assessments.**

Assessment is based upon the efficacy process being followed.

Evaluation process and test schedules are all followed and monitored in accordance to the guidelines of academic section of the Institute as follows.

| Mid term | Assignment | End semester exam | Grand total |
|----------|------------|-------------------|-------------|
| 30       | 10         | 60                | 100         |

But for the academic year 2019-2020 it had been differed due to abrogation of Article 370 and subsequent COVID-19 lockdown, the following evaluation schemes were adopted.

**Autumn 2019:**

| Assignment | End semester exam | Grand total |
|------------|-------------------|-------------|
| 10         | 90                | 100         |

**Spring 2020:**

| Maximum SGPA in Previous Semesters | Assignments as Mid Term Examination | Comprehensive Viva-Voce Examination | Grand total |
|------------------------------------|-------------------------------------|-------------------------------------|-------------|
| 30                                 | 30                                  | 40                                  | 100         |

**Grading criteria (Absolute Values)**

| A+  | A     | B+    | B     | C+    | C     | D   |
|-----|-------|-------|-------|-------|-------|-----|
| >90 | 81-90 | 71-80 | 61-70 | 51-60 | 40-50 | <40 |

**Seminar and Presentation Evaluation**

Assessment is based upon the methodology being followed and its effectiveness

A group of teachers along with Seminar coordinator evaluate the performance of students based on their presentation and viva-voce examination as per below format.

| S. No. | Student Name | Seminar Report (40) | PPT Preparation (20) | Viva and Presentation (40) | Total Marks (100) | Grade |
|--------|--------------|---------------------|----------------------|----------------------------|-------------------|-------|
|        |              |                     |                      |                            |                   |       |

**Mechanism for addressing evaluation related grievances**

Assessment is based upon the efficiency of the mechanism being followed.

- A transparent evaluation mechanism is followed as the answer sheets of mid-term examinations are shown to the students one week after the exam (date as mentioned in the institute academic calendar).

- The grades are displayed on the notice board prior to its finalization and submission to the controller of examination.

### 2.2.3 Quality of student projects (20)

(Quality of the project is measured in terms of consideration to factors including, but not limited to, environment, safety, ethics, cost, type (application, product, research, review etc.) and standards. Processes related to project identification, allotment, continuous monitoring, evaluation including demonstration of working prototypes and enhancing the relevance of projects. Mention Implementation details including details of POs and PSOs addressed through the projects with justification)

#### Identification of projects and allocation methodology to Faculty Members

- ❖ Students are divided into groups comprising of 3-4 students.
- ❖ Students are directed to submit the abstract of the project proposal to the project co-coordinator.
- ❖ The project coordinator evaluates it and if the topic is relevant, forwards it to the evaluation committee.
- ❖ Otherwise, the group has to come up with a new project proposal.
- ❖ The student also has to submit a time schedule according to which he is planning to complete the work.
- ❖ If the abstract is approved, Project area is identified and faculty having specialization in that particular area is assigned to the group of students.
- ❖ If the proposal is rejected the group should come up with a new proposal

#### Types and relevance of the projects and their contribution towards the attainment of POs and PSOs (2)

| S.No | TITLE                                             | STUDENT NAME                                  | PROJECT GUIDE | RELEVANT PO's and PSO's | ENVIRONMENT | SAFETY | ETHICS | COST |
|------|---------------------------------------------------|-----------------------------------------------|---------------|-------------------------|-------------|--------|--------|------|
| 1    | CONGESTION MANAGEMENT IN TRANSMISSION LINES USING | Udham Singh (426/11)<br>Priya Sharma (497/11) |               | PO1,PO2,PO3,            |             |        |        |      |

|   |                                                                                                                                             |                                   |                                |                                                    |   |   |   |   |
|---|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------------------|----------------------------------------------------|---|---|---|---|
|   | FACTS DEVICES.                                                                                                                              | Kapil Kumar<br>(373/11)           | Prof. Aijaz<br>Ahmed           | PO4,PO5,PO6,<br>PO10,PO12<br>PSO1,PSO2             | Y | Y | Y | Y |
|   |                                                                                                                                             | Anand Kumar<br>(431/11)           |                                |                                                    |   |   |   |   |
| 2 | PERFORMANCE<br>ANALYSIS OF<br>DIRECT<br>CONTROLLED<br>INDUCTION<br>MOTOR DRIVE<br>WITH FLUX OF<br>OPTIMIZATION.                             | Hadhiq Khan<br>(83/11)            | Dr.<br>MohdAbidBa<br>zaz       | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PSO1,PSO2          |   |   |   |   |
|   |                                                                                                                                             | Danish<br>Mushtaq<br>(19/11)      |                                |                                                    |   |   |   |   |
|   |                                                                                                                                             | Amjad Ali<br>(145/11)             |                                |                                                    | Y | Y | Y | Y |
| 3 | PERFORMANCE<br>INVESTIGATION<br>OF A SINGLE<br>PHASE,<br>UNIDIRECTIONAL<br>AC TO DC BOOST<br>CONVERTER FOR<br>POWER QUALITY<br>IMPROVEMENT. | Ilyas Amin<br>(03/11)             | Prof. A.H.<br>Bhat             | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PSO1,PSO2          |   |   |   |   |
|   |                                                                                                                                             | Hailiya Ahsan<br>(29/11)          |                                |                                                    |   |   |   |   |
|   |                                                                                                                                             | SairaManzoor<br>(49/11)           |                                |                                                    |   |   |   |   |
|   |                                                                                                                                             | StanzinZangm<br>o (160/11)        |                                |                                                    | Y | Y | Y | Y |
| 4 | TRANSIENT<br>STABILITY<br>ANALYSIS OF<br>MULTI MACHINE<br>POWER<br>SYSTEM(Simulink<br>modeling and<br>graphical animation)                  | MohdWasim<br>Shah (47/11)         | Prof. M.D.<br>Mufti            | PO1,PO2,PO3,<br>PO4,PO5,<br>PO9,PO12,PSO1,<br>PSO2 |   |   |   |   |
|   |                                                                                                                                             | Mudasirul<br>Amin (13/11)         |                                |                                                    |   |   |   |   |
|   |                                                                                                                                             | Junaid Farooq<br>(126/11)         |                                |                                                    | Y | Y | Y | Y |
| 5 | METER DATA<br>ACQUISITION<br>SYSTEMS.                                                                                                       | Mohd.<br>Numaan<br>Rather (43/11) | Prof.<br>Shameem<br>Ahmad Lone | PO1,PO2,PO3,<br>PO5,PO7,<br>PO8,PO9,PSO1,<br>PSO2  |   |   |   |   |
|   |                                                                                                                                             | Abdul Waris<br>(70/11)            |                                |                                                    | Y | Y | Y | Y |
| 6 | A TRANSIENT<br>STABILITY TOOL<br>COMBINING THE<br>SIME METHOD                                                                               | AfnanRafiq<br>(361/12)            | Prof.<br>Mairajud din<br>Mufti | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PO12,PSO1,<br>PSO2 |   |   |   |   |
|   |                                                                                                                                             | Aaqib Ali<br>Abaaa<br>(205/12)    |                                |                                                    |   |   |   |   |
|   |                                                                                                                                             | Faheem Lateef                     |                                |                                                    |   |   |   |   |

|    |                                                        |                                    |                          |                                                           |   |   |   |   |  |
|----|--------------------------------------------------------|------------------------------------|--------------------------|-----------------------------------------------------------|---|---|---|---|--|
|    | WITH MATLAB AND SIMULINK.                              | (314/12)                           |                          |                                                           |   |   |   |   |  |
|    |                                                        | Mukund Kumar (184/12)              |                          |                                                           | Y | Y | Y | Y |  |
|    |                                                        | Pradeep Kumar Mishra (151/12)      |                          |                                                           |   |   |   |   |  |
| 7  | PROTOTYPE ELECTRIC VEHICLE                             | Aakash (155/12)                    | Prof. A.H. BHAT          | PO1,PO2,PO3, PO5,PO11,PO9, PO7, PSO1, PSO2,PSO3           |   |   |   |   |  |
|    |                                                        | Rahul Bhardwaj (339/12)            |                          |                                                           |   |   |   |   |  |
|    |                                                        | Ankit Srivastava (391/12)          |                          |                                                           | Y | Y | Y | Y |  |
|    |                                                        | Kuljinder Pal Singh Sethi (313/12) |                          |                                                           |   |   |   |   |  |
| 8  | SINGLE PHASE GRID CONNECTED SOLAR PHOTOVOLTAIC SYSTEM. | TajamulRazaq (23/13)               | Dr. Sheikh Javed Iqbal   | PO1, PO2, PO3, PO5, PO6, PO7, PO9, PO12, PSO1, PSO2, PSO3 |   |   |   |   |  |
|    |                                                        | Raja Umer(30/13)                   |                          |                                                           |   |   |   |   |  |
|    |                                                        | Mahak Gull (45/13)                 |                          |                                                           | Y | Y | Y | Y |  |
|    |                                                        | Raja Owais (49/13)                 |                          |                                                           |   |   |   |   |  |
| 9  | SMART INTEGRATION OF SOLAR PV ARRAY WITH GRID.         | Varun Paul (70/13)                 | Prof. Aijaz Ahmed        | PO1, PO2, PO3, PO5, PO6, PO7, PO9, PO12, PSO1, PSO2, PSO3 |   |   |   |   |  |
|    |                                                        | Arpit Dixit (54/13)                |                          |                                                           |   |   |   |   |  |
|    |                                                        | SahilChandel (51/13)               |                          |                                                           | Y | Y | Y | Y |  |
|    |                                                        | Naveen Kumar (53/13)               |                          |                                                           |   |   |   |   |  |
| 10 | IMPROVEMENT OF LOAD FREQUENCY USING FLYWHEEL ENERGY    | Azeem Akbar Drabu(16/13)           | Prof. Mairajud din Mufti | PO1,PO2,PO3, PO4,PO9, PSO1,PSO2                           |   |   |   |   |  |
|    |                                                        | Gowher Hussain Wani(24/13)         |                          |                                                           | Y | Y | Y | Y |  |

|    |                                                                                                                         |                                 |                     |                                                    |   |   |   |   |
|----|-------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------|----------------------------------------------------|---|---|---|---|
|    | STORAGE.                                                                                                                | Nuha Bilal<br>(41/13)           |                     |                                                    |   |   |   |   |
|    |                                                                                                                         | Sinan Aquib<br>Gull (47/13)     |                     |                                                    |   |   |   |   |
| 11 | REDUCTION IN<br>HARMONICS AND<br>TORQUE RIPPLES<br>OF BLDC MOTOR<br>BY CASCADED H-<br>BRIDGE<br>MULTILEVEL<br>INVERTER. | Aakash<br>Gupta(34/13)          | Prof. A.H.<br>BHAT  | PO1,PO2,PO3,<br>PO4,PO9,PO12,<br>PO11,PSO1,PSO2    | Y | Y | Y | Y |
|    |                                                                                                                         | Nandeep<br>Kaushal<br>(38/13)   |                     |                                                    |   |   |   |   |
|    |                                                                                                                         | Mohd Irfan<br>Malik(48/13)      |                     |                                                    |   |   |   |   |
|    |                                                                                                                         | Rahul Kumar<br>Atri (36/13)     |                     |                                                    |   |   |   |   |
| 12 | NEWTON<br>RAPHSON POWER<br>FLOW ANALYSIS<br>INCLUDING<br>INDUCTION<br>MACHINE LOAD                                      | 1.Wasim Sajad<br>(216/14)       | Prof.M.D.Mu<br>fti  | PO1,PO2,PO3,<br>PO4,PO5,<br>PO9,PO12,PSO1,<br>PSO2 | Y | Y | Y | Y |
|    |                                                                                                                         | 2.Mohd.Ajaz<br>(217/14)         |                     |                                                    |   |   |   |   |
|    |                                                                                                                         | 3.Achraj<br>Gupta(263/14)       |                     |                                                    |   |   |   |   |
|    |                                                                                                                         | 4.Vatsal<br>Chauhan(269/1<br>4) |                     |                                                    |   |   |   |   |
| 13 | MODELLING AND<br>PITCH CONTROL<br>OF A GRID<br>CONNECTED<br>WIND TURBINE<br>ALONG WITH<br>BESS                          | 1.Vishwnath<br>Panda(246/14)    | Prof.M.D.Mu<br>fti  | PO1,PO2,PO3,<br>PO4,PO5,<br>PO9,PO12,PSO1,<br>PSO2 | Y | Y | Y | Y |
|    |                                                                                                                         | 2.Deepak<br>Kumar<br>(258/14)   |                     |                                                    |   |   |   |   |
|    |                                                                                                                         | 3.Sarvoday<br>Kumar<br>(274/14) |                     |                                                    |   |   |   |   |
|    |                                                                                                                         | 4.Kushal<br>Jayswal<br>(665/14) |                     |                                                    |   |   |   |   |
| 14 | ENHANCEMENT<br>OF POWER<br>SYSTEM<br>STABILITY USING<br>STATCOM AND D-<br>STATCOM                                       | 1.Himanshu<br>Bhaira(244/14)    | Prof.Aijaz<br>Ahmed | PO1,PO2,PO3,<br>PO4,PO5,<br>PO9,PO12,PSO1,<br>PSO2 | Y | Y | Y | Y |
|    |                                                                                                                         | 2.Sandeep<br>Kumar(237/14<br>)  |                     |                                                    |   |   |   |   |
|    |                                                                                                                         | 3.Mohit<br>Kumar<br>(238/14)    |                     |                                                    |   |   |   |   |
|    |                                                                                                                         | 4.Suresh                        |                     |                                                    |   |   |   |   |

|    |                                                                                                     |                                                                                                                                                      |                     |                                                                    |   |   |   |   |
|----|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------------------------------------------------------|---|---|---|---|
|    |                                                                                                     | Kumar<br>(266/14)                                                                                                                                    |                     |                                                                    |   |   |   |   |
| 15 | SOLAR PV<br>INTEGRATION<br>WITH GRID                                                                | 1.Ajay Singh<br>Shekhawat(24<br>1/14)<br>2.Gaurav<br>Singhal<br>(242/14)<br>3.Pradeep<br>Kukreja<br>(257/14)<br>4.Puneet<br>Kumar (261/14            | Prof.Aijaz<br>Ahmed | PO1,PO2,PO3,<br>PO4,PO5,<br>PO9,PO12,PSO1,<br>PSO2                 | Y | Y | Y | Y |
| 16 | WIND FARM<br>STABILITY USING<br>STATCOM                                                             | 1.Indrajeet<br>Panwar<br>(245/14)<br>2.Mahaveer(25<br>2/14)<br>3.Hikhama<br>Ram (664/14)                                                             | Prof.Aijaz<br>Ahmed | PO1,PO2,PO3,<br>PO4,PO5,<br>PO9,PO12,PSO1,<br>PSO2                 | Y | Y | Y | Y |
| 17 | SYSTEM STUDY<br>ANALYSIS OF 220<br>KV NETWORK IN<br>KASHMIR VALLEY                                  | 1.Yasir Nisar<br>(230/14)<br>2.Abrar Ali<br>(239/15)<br>3.Aabid<br>Hussain<br>(234/14)<br>4.Sohaib<br>Rashid<br>(205/14)<br>5.Anil Kumar<br>(260/14) | Prof.S.A<br>Lone    | PO1,PO2,PO3,<br>PO4,PO5,<br>PO9,PO12,PSO1,<br>PSO2                 | Y | Y | Y | Y |
| 18 | OPERATION AND<br>CONTROL OF<br>DOUBLY FED<br>INDUCTION<br>GENERATOR FOR<br>WIND POWER<br>GENERATION | 1.Nowsheena<br>Jan (275/15)<br>2.Amir Afzal<br>(221/14)<br>3.Irfan<br>(215/14)<br>4.Akashdeep(<br>212/14)                                            | Dr. S.J Iqbal       | PO1, PO2, PO3,<br>PO5, PO6, PO7,<br>PO9, PO12, PSO1,<br>PSO2, PSO3 | Y | Y | Y | Y |
| 19 | AUTOMATIC                                                                                           | 1.Naresh                                                                                                                                             | Dr. S.J Iqbal       | PO1, PO2, PO3,                                                     |   |   |   |   |

|    |                                                                           |                            |               |                                                           |   |   |   |   |
|----|---------------------------------------------------------------------------|----------------------------|---------------|-----------------------------------------------------------|---|---|---|---|
|    | POWER FACTOR CONTROLLER                                                   | Bavoria (210/14)           |               | PO5, PO6, PO7, PO9, PO12, PSO1, PSO2, PSO3                | Y | Y | Y | Y |
|    |                                                                           | 2.Pallavi Hundal (227/14)  |               |                                                           |   |   |   |   |
|    |                                                                           | 3.Rahul Badgal (233/14)    |               |                                                           |   |   |   |   |
|    |                                                                           | 4.Shikha Baldotra (201/15) |               |                                                           |   |   |   |   |
| 20 | SERIES COMPENSATION IN 3 LIMB TRANSFORMER (SELF COMPENSATING TRANSFORMER) | 1.Vishal Agrawal (272/14)  | Dr. S.J Iqbal | PO1, PO2, PO3, PO5, PO6, PO7, PO9, PO12, PSO1, PSO2, PSO3 | Y | Y | Y | Y |
|    |                                                                           | 2.Dileep Kumar (235/15)    |               |                                                           |   |   |   |   |
|    |                                                                           | 3.Ranvir Singh (236/14)    |               |                                                           |   |   |   |   |
|    |                                                                           | 4.Mahendra Kumar (273/14)  |               |                                                           |   |   |   |   |
| 21 | CONTROL OF SINGLE PHASE GRID CONNECTED PHOTOVOLTAIC SYSTEM WITH MPPT      | 1.Uzma Dar (218/14)        | Dr.S.J Iqbal  | PO1, PO2, PO3, PO5, PO6, PO7, PO9, PO12, PSO1, PSO2, PSO3 | Y | Y | Y | Y |
|    |                                                                           | 2.Uzmah Javed (203/14)     |               |                                                           |   |   |   |   |
|    |                                                                           | 3.Ifrah Parvez (226/14)    |               |                                                           |   |   |   |   |
|    |                                                                           | 4.Bazila Mushtaq (223/14)  |               |                                                           |   |   |   |   |
|    |                                                                           | 5.Abrar Ahmad Bhat(276/14) |               |                                                           |   |   |   |   |
| 22 | GSM BASED FAULT DETECTION AND MONITORING OF POWER SYSTEM                  | 1.Azad Hamza (214/14)      | Dr.S. J Iqbal | PO1, PO2, PO3, PO5, PO6, PO7, PO9, PO12, PSO1, PSO2, PSO3 | Y | Y | Y | Y |
|    |                                                                           | 2.Hilal Ahmad (224/14)     |               |                                                           |   |   |   |   |
|    |                                                                           | 3.Aquib Manzoor (229/14)   |               |                                                           |   |   |   |   |

|    |                                                                                   |                                                                                                               |                |                                           |   |   |   |   |
|----|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------|---|---|---|---|
|    |                                                                                   | 4.Waseem Farooq (209/14)                                                                                      |                |                                           |   |   |   |   |
| 23 | MODEL ORDER REDUCTION AND CONTROL OF LARGE SCALE SYSTEMS                          | 1.Rajan Gupta (750/14)<br>2.Amit Sharma (232/14)<br>3.Danish Gupta (219/14)<br>4.Vishal Verma (220/14)        | Dr.M.A Bazaz   | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2       | Y | Y | Y | Y |
| 24 | EVOLUTIONARY NEURAL NETWORK APPLIED TO INDUCTION MOTOR STATOR FAULT DETECTION     | 1.Gaurav Kumar (259/14)<br>2.Himanshu Bhardwaj (262/14)<br>3.Manisha Meena (250/14)<br>4.Mohit Gupta (268/14) | Dr.M.A Bazaz   | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2       | Y | Y | Y | Y |
| 25 | ACCELERATED SIMULATION OF POWER ELECTRONIC CONVERTERS USING MODEL ORDER REDUCTION | 1.Abhishek Kumar (240/14)<br>2.Mrityunjay Kumar (265/14)                                                      | Dr. M.ABazaz   | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2       | Y | Y | Y | Y |
| 26 | DIRECT SELF CONTROL OF INDUCTION MOTOR                                            | 1.Prabhiti<br>2.Hooda<br>3.Suman                                                                              | Dr. M.A. Bazaz | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |

|    |                                                                                               |                                                                                                   |                                             |                                           |   |   |   |   |
|----|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------|---|---|---|---|
| 27 | DESIGN AND SIMULATION OF A 1-PHASE AC TO 1-PHASE AC CONVERTER WITHOUT FREQUENCY RESTRICTIONS. | Taniya Manzoor (225/14)                                                                           | Dr. T.N Mir                                 | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |
| 28 | COMPARATIVE ANALYSIS OF MODULATION STRATEGIES FOR 3-PHASE VOLTAGE SOURCE CONVERTER            | 1.Mohd. Zarkab Farooqi (208/14)<br>2.Aijaz Ahmad Khan (202/14)<br>3.Salman Fayaz Khan (663/14)    | Dr.T.N Mir & Prof. A.H Bhat (Co-Supervisor) | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |
| 29 | THREE-PHASE TO THREE-PHASE MATRIX CONVERTER BASED INDUCTION MOTOR DRIVE                       | 1.Sohaib Shafat Qazi (213/14)<br>2.Burooj Iqbal (206/14)<br>3.Adnan Farooq (211/14)               | Dr.T.N Mir                                  | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |
| 30 | SENSOR LESS VECTOR CONTROL OF 3-PHASE INDUCTION MOTOR                                         | 1.Akhilesh Kumar (254/14)<br>2.Anuj Kumar (247/14)<br>3.Tarun mangal (264/14)<br>4.Vaibhav Mishra | Dr.T.N Mir                                  | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |

|    |                                                                               |                         |                                         |                                           |   |   |   |   |
|----|-------------------------------------------------------------------------------|-------------------------|-----------------------------------------|-------------------------------------------|---|---|---|---|
|    |                                                                               | (255/14)                |                                         |                                           |   |   |   |   |
| 31 | Expert System For Condition Monitoring Of Power Transformer Using Fuzzy Logic | 1. Akash Mohan (58/15)  | Prof. M. D. Mufti and Dr. Chilaka Ranga | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |
|    |                                                                               | 2. Sandeep Kumar        |                                         |                                           |   |   |   |   |
|    |                                                                               | 3. Sunil Kumar          |                                         |                                           |   |   |   |   |
|    |                                                                               | 4. Aditya Ujjawal       |                                         |                                           |   |   |   |   |
| 32 | Single Axis Solar Tracker With Power Logger Using Bluetooth Module            | 1. Pradeep Meena        | Prof. M. D. Mufti and Dr. Kushal Jagtap | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |
|    |                                                                               | 2. Sonu Pal             |                                         |                                           |   |   |   |   |
|    |                                                                               | 3. Sanjay Kumar         |                                         |                                           |   |   |   |   |
|    |                                                                               | 4. Shantnu Sharma       |                                         |                                           |   |   |   |   |
| 33 | Automatic Irrigation Using Arduino And GSM Module                             | 1. Ranjeet Singh        | Prof. M. D. Mufti and Dr. Kushal Jagtap | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |
|    |                                                                               | 2. Manish Kumar Mahala  |                                         |                                           |   |   |   |   |
|    |                                                                               | 3. Aman Sinha           |                                         |                                           |   |   |   |   |
|    |                                                                               | 4. Vipin Kumar Mahawar  |                                         |                                           |   |   |   |   |
| 34 | Power Quality Improvement Using DSTATCOM                                      | 1. Lokesh Meena         | Prof. Aijaz Ahmad                       | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |
|    |                                                                               | 2. Shameem Hussain Azad |                                         |                                           |   |   |   |   |
|    |                                                                               | 3. Surendra Kumar       |                                         |                                           |   |   |   |   |
|    |                                                                               |                         |                                         |                                           |   |   |   |   |
| 35 | Solar PV Integration With Grid                                                | 1. Ramesh Kachhwal      | Prof. Aijaz Ahmad                       | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |
|    |                                                                               | 2. Avadhesh Soni        |                                         |                                           |   |   |   |   |
|    |                                                                               | 3. Surendra Mehru       |                                         |                                           |   |   |   |   |
|    |                                                                               | 4. Shubam               |                                         |                                           |   |   |   |   |

|    |                                                                                               |                             |                                        |                                           |   |   |   |   |  |
|----|-----------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------|-------------------------------------------|---|---|---|---|--|
|    |                                                                                               | Raina                       |                                        |                                           |   |   |   |   |  |
| 36 | Automatic Load Sharing Of Transformer Using Arduino                                           | 1. Abid Hussain             | Prof. S. A. Lone and Dr. Kushal Jagtap | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |  |
|    |                                                                                               | 2. Shubam Sindhu            |                                        |                                           |   |   |   |   |  |
|    |                                                                                               | 3. Rohit Choor              |                                        |                                           |   |   |   |   |  |
|    |                                                                                               | 4. Ankush Kumar             |                                        |                                           |   |   |   |   |  |
|    |                                                                                               | 5. Pawan Kumar Meena        |                                        |                                           |   |   |   |   |  |
| 37 | Study And Simulation Of Power System Stability Enhancement Using Governor, Excitation And AVR | 1. Mouzim Mushtaq           | Prof. S. A. Lone                       | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |  |
|    |                                                                                               | 2. Aasif Hassan Lone        |                                        |                                           |   |   |   |   |  |
|    |                                                                                               | 3. Asmat Ali Haroon         |                                        |                                           |   |   |   |   |  |
|    |                                                                                               | 4. Mohammad Muneeb Ul Haque |                                        |                                           |   |   |   |   |  |
| 38 | Dynamic Modelling And Analysis Of Induction Motor On Different Loads Using Simulink           | 1. Jyoti Choudhary          | Prof. S. A. Lone and Dr. Asadur Rahman | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |  |
|    |                                                                                               | 2. Suryansh Mishra          |                                        |                                           |   |   |   |   |  |
|    |                                                                                               | 3. Sanika Verma             |                                        |                                           |   |   |   |   |  |
|    |                                                                                               | 4. Neha Sharma              |                                        |                                           |   |   |   |   |  |
| 39 | Design Of Lab Kit, Measurement Of High Resistance Using Loss Of Charge Method                 | 1. Aifa Usman               | Prof. S. A. Lone                       | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |  |
|    |                                                                                               | 2. Raiya Manzoor            |                                        |                                           |   |   |   |   |  |
|    |                                                                                               | 3. Jasera Jabeen            |                                        |                                           |   |   |   |   |  |
|    |                                                                                               | 4. Tahseen Aftab            |                                        |                                           |   |   |   |   |  |
|    |                                                                                               | 5. Gowhar Maqbool           |                                        |                                           |   |   |   |   |  |
| 40 | GSM Based Smart Energy Meter Using                                                            | 1. Gulshan Kumar            | Prof. S. A. Lone and Dr. Farhad Ilahi  | PO1,PO2,PO3, PO4,PO9,PO12,                |   |   |   |   |  |
|    |                                                                                               | 2. Jaiprakash Patel         |                                        |                                           |   |   |   |   |  |

|    |                                                                                 |                             |                 |                                           |   |   |   |   |
|----|---------------------------------------------------------------------------------|-----------------------------|-----------------|-------------------------------------------|---|---|---|---|
|    | Arduino                                                                         | 3. Mukesh                   | Bakhsh          | PO11,PSO1,PSO2                            | Y | Y | Y | Y |
|    |                                                                                 | 4. Rahul                    |                 |                                           |   |   |   |   |
| 41 | Operation And Control Of Single Phase Grid Connected PV System                  | 1. Owais Mohi Ud Din Hurrah | Dr. S. J. Iqbal | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |
|    |                                                                                 | 2. Nisar Ahmad Malla        |                 |                                           |   |   |   |   |
|    |                                                                                 | 3. Irfan Aziz               |                 |                                           |   |   |   |   |
|    |                                                                                 | 4. Aazim Latief             |                 |                                           |   |   |   |   |
| 42 | Control Of An Inverter Pendulum                                                 | 1. Aqsa Rouf                | Dr. S. J. Iqbal | PO1,PO2,PO3, PO4,PO9,PO12, PO11,PSO1,PSO2 | Y | Y | Y | Y |
|    |                                                                                 | 2. Basit Gul                |                 |                                           |   |   |   |   |
|    |                                                                                 | 3. Mohammad Saleh Khan      |                 |                                           |   |   |   |   |
|    |                                                                                 | 4. Faheem Abdullah          |                 |                                           |   |   |   |   |
| 43 | Active Disturbance Rejection Control Of First And Second Order System (ADRC)    | 1. Akhil Verma              | Dr. M. A. Bazaz | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2       | Y | Y | Y | Y |
|    |                                                                                 | 2. Nawaz Ahmed              |                 |                                           |   |   |   |   |
| 44 | Performance Investigation Of Vector Control Strategy For Induction Motor Drives | 1. Gaurangi Chowdhary       | Dr. M. A. Bazaz | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2       | Y | Y | Y | Y |
|    |                                                                                 | 2. Sonali Sarangal          |                 |                                           |   |   |   |   |
| 45 | Design and control of a dual axis two wheel self-balancing robot                | 1. Bhadu Nath               | Dr. M. A. Bazaz | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2       | Y | Y | Y | Y |
| 46 | Attitude Control Of Quadcopter                                                  | 1. Puneet Sharma            | Dr. M. A. Bazaz | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2       |   |   |   |   |
|    |                                                                                 | 2. Rahul Jarngal            |                 |                                           |   |   |   |   |

|    |                                                                                                                                       |                            |                                        |                                     |   |   |   |   |
|----|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------|-------------------------------------|---|---|---|---|
|    |                                                                                                                                       | 3. Rahul Kumar             |                                        |                                     | Y | Y | Y | Y |
|    |                                                                                                                                       | 4. Siddhant Shekhar        |                                        |                                     |   |   |   |   |
| 47 | PWM Rectifier For Improved Power Quality AC-DC Conversion                                                                             | 1. Rajendra Singh          | Ms. Tabish Nazir and Prof. A. H. Bhat  | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2 |   |   |   |   |
|    |                                                                                                                                       | 2. Dharmendra Kumar        |                                        |                                     |   |   |   |   |
|    |                                                                                                                                       | 3. Deepak Rajput           |                                        |                                     |   |   |   |   |
|    |                                                                                                                                       | 4. Saurav Kumar            |                                        |                                     | Y | Y | Y | Y |
|    |                                                                                                                                       | 5. Manish Vajpeyi          |                                        |                                     |   |   |   |   |
| 48 | Design And Analysis Of A PCB Prototype Buck Boost Converter.                                                                          | 1. Peerzada Sibtain        | Ms. Tabish Nazir and Prof. A. H. Bhat  | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2 |   |   |   |   |
|    |                                                                                                                                       | 2. Faisal Mohammad Ahanger |                                        |                                     |   |   |   |   |
|    |                                                                                                                                       | 3. Simran Kerni            |                                        |                                     | Y | Y | Y | Y |
|    |                                                                                                                                       | 4. Savita Sharma           |                                        |                                     |   |   |   |   |
| 49 | Modelling Of Wind Turbine Connected To Grid And Charging And Discharging Battery Energy Storage System Using Embedded MATLAB Function | Sarvoday Kumar             | Prof. M. D. Mufti                      | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2 | Y | Y | Y | Y |
| 50 | Advanced Regenerative Breaking System Along With ABS In A Hybrid Vehicle                                                              | Kafeel Rabbani             | Prof. S. A. Lone                       | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2 | Y | Y | Y | Y |
| 51 | REACTIVE POWER COMPENSATIO                                                                                                            | MD Amir Khalil 69/16       | <b>Supervisor:</b><br>Prof Aijaz Ahmad | PO1,PO2,PO3, PO4,PO5,PO9, PSO1,PSO2 |   |   |   |   |
|    |                                                                                                                                       | Sagar Dubey 43/16          |                                        |                                     |   |   |   |   |

|    |                                                                                   |                                |                                           |                                           |   |   |   |   |
|----|-----------------------------------------------------------------------------------|--------------------------------|-------------------------------------------|-------------------------------------------|---|---|---|---|
|    | N BY FIXED<br>CAPACITOR AND<br>STATCOM                                            | Hardik<br>Damor<br>153/16      |                                           |                                           | Y | Y | Y | Y |
|    |                                                                                   | Dheeraj<br>Kumar<br>100/16     |                                           |                                           |   |   |   |   |
| 52 | CONGESTION<br>MANAGEMENT<br>IN<br>RESTRUCTURED<br>POWER SYSTEM                    | Sanjeev<br>Verma 205/16        | <b>Supervisor:</b><br>Prof Aijaz<br>Ahmad | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PSO1,PSO2 |   |   |   |   |
|    |                                                                                   | Jaswinder<br>Singh 202/16      |                                           |                                           |   |   |   |   |
|    |                                                                                   | Deepak<br>101/16               |                                           |                                           | Y | Y | Y | Y |
|    |                                                                                   | Aditya 131/16                  |                                           |                                           |   |   |   |   |
| 53 | EFFICIENT<br>ALGORITHM<br>FOR TRANSIENT<br>STABILITY OF<br>LARGE POWER<br>SYSTEMS | Balram Singh<br>186/16         | <b>Supervisor:</b><br>Dr Abid<br>Bazaz    | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PSO1,PSO2 |   |   |   |   |
|    |                                                                                   | Krishan<br>Kumar<br>155/16     |                                           |                                           |   |   |   |   |
|    |                                                                                   | Sawrabha<br>Verma 215/16       |                                           |                                           | Y | Y | Y | Y |
|    |                                                                                   | Adarsh<br>Kumar Pandy<br>35/16 |                                           |                                           |   |   |   |   |
| 54 | CONTROL OF<br>ROBOTIC ARM<br>TWO-LINK<br>MANIPULATOR<br>BY ADRC                   | Siddhart<br>Gupta 250/16       | <b>Supervisor:</b><br>Dr Abid<br>Bazaz    | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PSO1,PSO2 |   |   |   |   |
|    |                                                                                   | Ashish Dular<br>398/16         |                                           |                                           |   |   |   |   |
|    |                                                                                   | Priyanka<br>baboria<br>335/16  |                                           |                                           | Y | Y | Y | Y |
| 55 | AVR WITH ADRC                                                                     | Aman Kumar<br>257/16           | <b>Supervisor:</b><br>Dr Abid<br>Bazaz    | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PSO1,PSO2 |   |   |   |   |
|    |                                                                                   | Aman Singh<br>329/16           |                                           |                                           |   |   |   |   |
|    |                                                                                   | MD Aphroj<br>Alam 305/16       |                                           |                                           | Y | Y | Y | Y |
| 56 | ACTIVE<br>DISTURBA                                                                | Tabasum<br>Nazir 127/16        | <b>Supervisor:</b><br>Dr Abid<br>Bazaz    | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PSO1,PSO2 |   |   |   |   |

|    |                                                                                            |                                       |                                           |                                           |   |   |   |   |
|----|--------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------|-------------------------------------------|---|---|---|---|
|    | NCE<br>REJECTION<br>CONTROL<br>OF A<br>QUADCOPT<br>OR                                      | Haseeba<br>Maqbool<br>183/16          |                                           |                                           | Y | Y | Y | Y |
|    |                                                                                            | Raheel Tariq<br>04/16                 |                                           |                                           |   |   |   |   |
| 57 | V/f SPEED<br>CONTROL Of<br>INDUCTION<br>MOTOR                                              | Arjun Bhagat<br>187/16                | <b>Supervisor:</b><br>Dr Kushal<br>Jagtap | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PSO1,PSO2 |   |   |   |   |
|    |                                                                                            | Aman Nigam<br>156/16                  |                                           |                                           |   |   |   |   |
|    |                                                                                            | Raj<br>Raheshwar<br>Kanoria<br>157/16 |                                           |                                           | Y | Y | Y | Y |
|    |                                                                                            | Manesh<br>Kumar<br>185/16             |                                           |                                           |   |   |   |   |
| 58 | PIEZOELECTRIC<br>POWER<br>GENERATION IN<br>PNEUMATIC<br>TIRES                              | Umar Mustaq<br>75/16                  | <b>Supervisor:</b><br>Dr Kushal<br>Jagtap | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PSO1,PSO2 |   |   |   |   |
|    |                                                                                            | Owais Ali<br>40/16                    |                                           |                                           |   |   |   |   |
|    |                                                                                            | Enayat Gul<br>17/16                   |                                           |                                           | Y | Y | Y | Y |
|    |                                                                                            | Mohsin Amin<br>161/16                 |                                           |                                           |   |   |   |   |
| 59 | POWER<br>FACTOR<br>IMPROVEME<br>NT IN<br>DISTRIBUTI<br>ON SYSTEMS<br>USING D-<br>STATCOM'S | Aabid Ahmad<br>Dar 292/16             | <b>Supervisor:</b><br>Dr Kushal<br>Jagtap | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PSO1,PSO2 |   |   |   |   |
|    |                                                                                            | Shakir<br>Mubarak<br>382/16           |                                           |                                           |   |   |   |   |
|    |                                                                                            | MD Ashraf<br>Lali 94/16               |                                           |                                           | Y | Y | Y | Y |
|    |                                                                                            | Jamsheed<br>Javed 299/16              |                                           |                                           |   |   |   |   |
| 60 | GREY WOLF<br>OPTIMIZATION<br>ALGORITHM<br>FOR OPTIMAL<br>SITING AND<br>SIZING OF           | Aftab 403/16                          | <b>Supervisor:</b><br>Dr Kushal<br>Jagtap | PO1,PO2,PO3,<br>PO4,PO5,PO9,<br>PSO1,PSO2 | Y | Y | Y | Y |

|    |                                                                |                            |                                                                     |                                                 |   |   |   |   |
|----|----------------------------------------------------------------|----------------------------|---------------------------------------------------------------------|-------------------------------------------------|---|---|---|---|
|    | CAPACITORS                                                     |                            |                                                                     |                                                 |   |   |   |   |
| 61 | REACTIVE POWER COMPENSATION USING STATCOM                      | Aman Deep 147/16           | <b>Supervisor:</b><br>Dr Kushal Jagtap                              | PO1,PO2,PO3, PO5,PO11,PO9, PO7, PSO1, PSO2,PSO3 | Y | Y | Y | Y |
| 62 | CONDITION MONITORING OF POWER TRANSFORMER USING FUZZY LOGIC    | Irshad Ahmad 152/16        | <b>Supervisor:</b><br>Dr Chilaka Ranga                              | PO1,PO2,PO3, PO5,PO11,PO9, PO7, PSO1, PSO2,PSO3 | Y | Y | Y | Y |
|    |                                                                | Sai Ganesh 309/16          |                                                                     |                                                 |   |   |   |   |
|    |                                                                | Ratan Sagar 189/16         |                                                                     |                                                 |   |   |   |   |
|    |                                                                | Rahul Jaikar 337/16        |                                                                     |                                                 |   |   |   |   |
| 63 | MODULATION TECHNIQUES FOR 1 $\phi$ -3 $\phi$ MATRIX CONVERTERS | Adarsh Kumar 10/16         | <b>Supervisor:</b><br>Ms Tabish Mir and Prof A H Bhat (Co)          | PO1,PO2,PO3, PO5,PO11,PO9, PO7, PSO1, PSO2,PSO3 | Y | Y | Y | Y |
|    |                                                                | Kavish Sitholiwal 332/16   |                                                                     |                                                 |   |   |   |   |
|    |                                                                | Shivanshu Tripathi 105/16  |                                                                     |                                                 |   |   |   |   |
|    |                                                                | Ankit Kumar 396/16         |                                                                     |                                                 |   |   |   |   |
| 64 | CONTROL TECHNIQUES FOR 'CUK CONVERTER'.                        | Javaid Ahmad Rashi 137/16  | <b>Supervisor:</b><br>Ms Tabish Mir and Prof A H Bhat (Co)          | PO1,PO2,PO3, PO5,PO11,PO9, PO7, PSO1, PSO2,PSO3 | Y | Y | Y | Y |
|    |                                                                | Ubaid Bashir Wani 308/16   |                                                                     |                                                 |   |   |   |   |
|    |                                                                | Aadil Hussain Hajam 290/16 |                                                                     |                                                 |   |   |   |   |
|    |                                                                | Rohit Kumar Shah 11/16     |                                                                     |                                                 |   |   |   |   |
| 65 | DESIGN AND SIMULATION OF DC- DC BUCK CONVERTER                 | Gowher Majeed 273/16       | <b>Supervisor:</b><br>Ms. Tabish Mir and Dr. Amir Sheikh (ECE) (Co) | PO1,PO2,PO3, PO5,PO11,PO9, PO7, PSO1, PSO2,PSO3 | Y | Y | Y | Y |

**Project related to Industry**

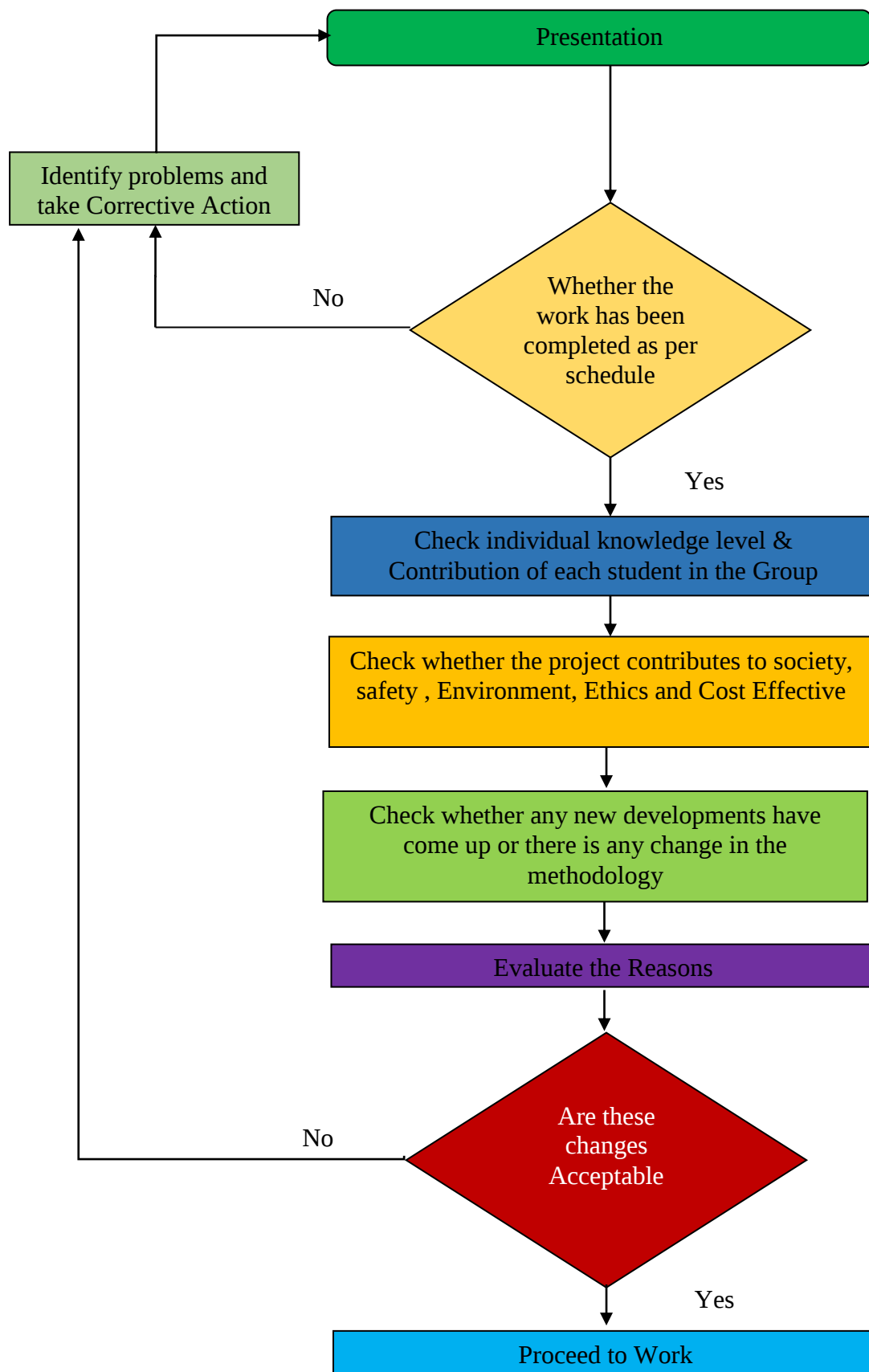
Some projects are undertaken by students in collaboration with organizations like Power Development Department (PDD), Power Development Corporation (PDC) of Jammu and Kashmir government.

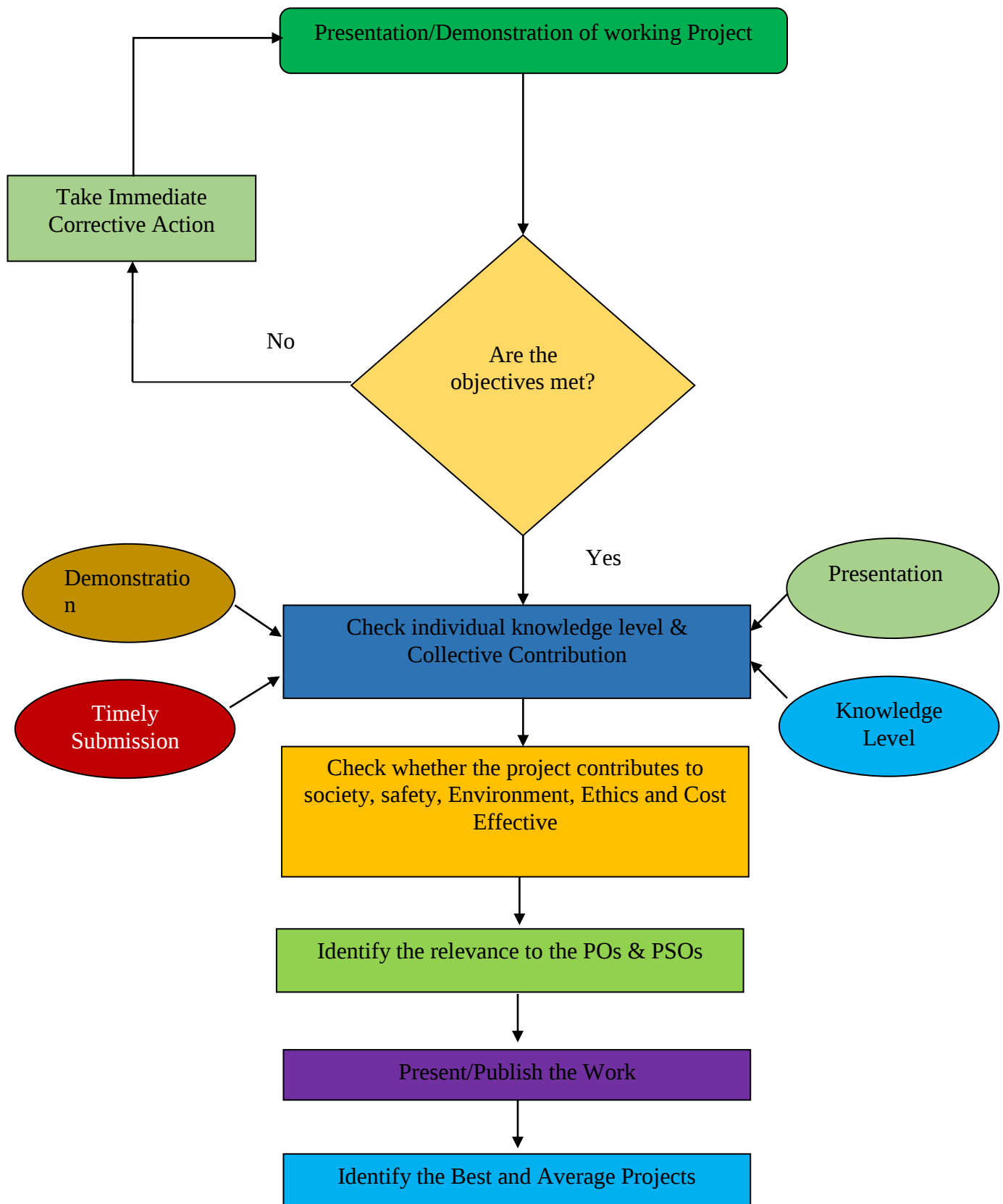
**Process for monitoring and evaluation**

- ❖ Students are directed to maintain a project diary to record the activities they do in relation to the project.
- ❖ The Project evaluation committee and the project guide together will analyze the nature of the project during the different stages of evaluation and make sure that the work is environment-friendly, ensures safety, ethics and is cost effective.
- ❖ The type of the project selected could be an application, product, a review or a research work.
- ❖ The projects are classified into different areas and their relevance to PO's and PSO's are identified to ensure its quality.
- ❖ Students, with the help of project guide, are encouraged to publish their work in relevant journals.

**RUBRIC for B.Tech Dissertation (Electrical Department)**

| FACULTY                      | MARKS OBTAINED | AREA EXAMINED                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EXAMINER                     | 20             | Examines the scope and objective of the dissertation, student's knowledge and interpretation of literature. Looks for the methodology and results of the dissertation and also how the topic is being presented.                                                                                                                                                               |
| SENIOR FACULTY OF DEPARTMENT | 10             | Examines the quality of results obtained and the approach used for it. The way of presentation and knowledge of the topic should be appropriate.                                                                                                                                                                                                                               |
| H.O.D (HEAD OF DEPARTMENT)   | 20             | Examines the level of understanding and originality in the analysis of project topic. The writing style and layout of the dissertation should be of good quality, with no or extremely few linguistic and typographical errors.                                                                                                                                                |
| SUPERVISOR                   | 50             | Examines whether the project demonstrates a high level of understanding and originality in the analysis (theoretical and/or empirical). The project topic should make a significant contribution to the knowledge base of the discipline and field of study. The topic should be innovative having the future scope and the results should be appropriate and of high quality. |

**Process for monitoring:****Figure: Process for Monitoring of the Student Project**

**Evaluation Process:****Figure: Evaluation Process of the Student Project**

Members of a project group prepare and submit their report.

- The report records all aspects of the work, highlighting all the problems faced and the approach/method employed to solve such problems.

| Final Evaluation             |                                                            |               |            |
|------------------------------|------------------------------------------------------------|---------------|------------|
|                              | Criteria                                                   | Marks Awarded | Total      |
| Project Evaluation Committee | Examiner                                                   | 20            | 50         |
|                              | Senior faculty of the department                           | 10            |            |
|                              | Head of the department                                     | 20            |            |
| Project Guide                | Continuous monitoring of performance assessed by the guide | 50            | 50         |
| <b>Total Marks</b>           |                                                            | <b>100</b>    | <b>100</b> |

### Process to assess individual and team performance

Individual learning and performance is assessed in the following ways-

Some faculty members add an individual component to group projects (e.g., a short essay, journal entries); some combine a group project with an individual test or quiz. Both group and individual performance are then reflected in the total project grade (e.g., some faculty members make the group grade worth 50% and the individual grade worth 50%; others split it 80%/20%. There's no perfect breakdown, but the grading scheme reflects goals for student learning.

**Quality of completed projects/working prototypes****Best Projects CAYm3 (2014-15)**

| S. NO | Title of the project                                                                                                | Students                    | Projects Conducted At | Project Guide          |
|-------|---------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------|------------------------|
| 1     | CONGESTION MANAGEMENT IN TRANSMISSION LINES USING FACTS DEVICES.                                                    | Udham Singh (426/11)        | N.I.T. SRINAGAR       | Dr.Aijaz Ahmed         |
|       |                                                                                                                     | Priya Sharma (497/11)       |                       |                        |
|       |                                                                                                                     | Kapil Kumar (373/11)        |                       |                        |
|       |                                                                                                                     | Anand Kumar (431/11)        |                       |                        |
| 2     | PERFORMANCE ANALYSIS OF DIRECT CONTROLLED INDUCTION MOTOR DRIVE WITH FLUX OF OPTIMIZATION.                          | Hadhiq Khan (83/11)         | N.I.T. SRINAGAR       | Dr. Mohd Abid Bazaz    |
|       |                                                                                                                     | Danish Mushtaq (19/11)      |                       |                        |
|       |                                                                                                                     | Amjad Ali (145/11)          |                       |                        |
| 3     | PERFORMANCE INVESTIGATION OF A SINGLE PHASE, UNIDIRECTIONAL AC TO DC BOOST CONVERTER FOR POWER QUALITY IMPROVEMENT. | Ilyas Amin (03/11)          | N.I.T. SRINAGAR       | Dr. A.H. Bhat          |
|       |                                                                                                                     | Hailiya Ahsan (29/11)       |                       |                        |
|       |                                                                                                                     | Saira Manzoor (49/11)       |                       |                        |
|       |                                                                                                                     | Stanzin Zangmo (160/11)     |                       |                        |
| 4     | TRANSIENT STABILITY ANALYSIS OF MULTI MACHINE POWER SYSTEM(Simulink modeling and graphical animation).              | Mohd Wasim Shah (47/11)     | N.I.T. SRINAGAR       | Dr. M.D. Mufti         |
|       |                                                                                                                     | Mudasir ul Amin (13/11)     |                       |                        |
|       |                                                                                                                     | Junaid Farooq (126/11)      |                       |                        |
| 5     | METER DATA ACQUISITION SYSTEMS.                                                                                     | Mohd. Numaan Rather (43/11) | N.I.T. SRINAGAR       | Dr. Shameem Ahmad Lone |
|       |                                                                                                                     | Abdul Waris (70/11)         |                       |                        |

**Best Projects CAYm2 (2015-16)**

| S.NO | Title of the project                                                           | Students                           | Projects Conducted At | Project Guide           |
|------|--------------------------------------------------------------------------------|------------------------------------|-----------------------|-------------------------|
| 1    | A TRANSIENT STABILITY TOOL COMBINING THE SIME METHOD WITH MATLAB AND SIMULINK. | Afnan Rafiq (361/12)               | N.I.T. SRINAGAR       | Dr. Mairaj ud din Mufti |
|      |                                                                                | Aaqib Ali Abaaa (205/12)           |                       |                         |
|      |                                                                                | Faheem Lateef (314/12)             |                       |                         |
|      |                                                                                | Mukund Kumar (184/12)              |                       |                         |
|      |                                                                                | Pradeep Kumar Mishra (151/12)      |                       |                         |
| 2    | PROTOTYPE ELECTRIC VEHICLE.                                                    | Aakash (155/12)                    | N.I.T. SRINAGAR       | Dr. A.H. BHAT           |
|      |                                                                                | Rahul Bhardwaj (339/12)            |                       |                         |
|      |                                                                                | Ankit Srivastava (391/12)          |                       |                         |
|      |                                                                                | Kuljinder Pal Singh Sethi (313/12) |                       |                         |

**Best Projects CAYm1 (2016-17)**

| S. NO | Title of the project                                   | Students                   | Projects Conducted At | Project Guide           |
|-------|--------------------------------------------------------|----------------------------|-----------------------|-------------------------|
| 1     | SINGLE PHASE GRID CONNECTED SOLAR PHOTOVOLTAIC SYSTEM. | Tajamul Razaq (23/13)      | N.I.T SRINAGAR        | Dr. Sheikh Javed Iqbal  |
|       |                                                        | Raja Umer (30/13)          |                       |                         |
|       |                                                        | Mahak Gull (45/13)         |                       |                         |
|       |                                                        | Raja Owais (49/13)         |                       |                         |
| 2     | SMART INTEGRATION OF SOLAR PV ARRAY WITH GRID.         | Varun Paul (70/13)         | N.I.T SRINAGAR        | Dr. Aijaz Ahmad         |
|       |                                                        | Arpit Dixit (54/13)        |                       |                         |
|       |                                                        | Sahil Chandel (51/13)      |                       |                         |
|       |                                                        | Naveen Kumar (53/13)       |                       |                         |
| 3     | IMPROVEMENT OF LOAD FREQUENCY USING FLYWHEEL ENERGY    | Azeem Akbar Drabu(16/13)   | N.I.T SRINAGAR        | Dr. Mairaj ud din Mufti |
|       |                                                        | Gowher Hussain Wani(24/13) |                       |                         |
|       |                                                        | Nuha Bilal (41/13)         |                       |                         |

|   |                                                                                                   |                          |                |               |
|---|---------------------------------------------------------------------------------------------------|--------------------------|----------------|---------------|
|   | STORAGE.                                                                                          | Sinan Aquib Gull (47/13) |                |               |
| 4 | REDUCTION IN HARMONICS AND TORQUE RIPPLES OF BLDC MOTOR BY CASCADED H-BRIDGE MULTILEVEL INVERTER. | Aakash Gupta(34/13)      | N.I.T SRINAGAR | Dr. A.H. BHAT |
|   |                                                                                                   | Nandeep Kaushal (38/13)  |                |               |
|   |                                                                                                   | Mohd Irfan Malik(48/13)  |                |               |
|   |                                                                                                   | Rahul Kumar Atri (36/13) |                |               |

**Best Projects CAYm1 (2017-18)**

| S. NO | Title of the project                                                               | Students                        | Projects Conducted At | Project Guide                               |
|-------|------------------------------------------------------------------------------------|---------------------------------|-----------------------|---------------------------------------------|
| 1     | COMPARATIVE ANALYSIS OF MODULATION STRATEGIES FOR 3-PHASE VOLTAGE SOURCE CONVERTER | 1.Mohd. Zarkab Farooqi (208/14) | N.I.T SRINAGAR        | Dr.T.N Mir & Prof. A.H Bhat (Co-Supervisor) |
|       |                                                                                    | 2.Aijaz Ahmad Khan (202/14)     |                       |                                             |
|       |                                                                                    | 3.Salman Fayaz Khan (663/14)    |                       |                                             |
| 2     | OPERATION AND CONTROL OF DOUBLY FED INDUCTION GENERATOR FOR WIND POWER GENERATION  | 1.Nowsheena Jan (275/15)        | N.I.T SRINAGAR        | Dr. S. J. Iqbal                             |
|       |                                                                                    | 2.Amir Afzal (221/14)           |                       |                                             |
|       |                                                                                    | 3.Irfan (215/14)                |                       |                                             |
|       |                                                                                    | 4.Akashdeep( 212/14)            |                       |                                             |
| 3     | EVOLUTIONARY NEURAL NETWORK APPLIED TO INDUCTION MOTOR STATOR FAULT DETECTION      | 1.Gaurav Kumar (259/14)         | N.I.T SRINAGAR        | Dr. M. A. Bazaz                             |
|       |                                                                                    | 2.Himanshu Bhardwaj (262/14)    |                       |                                             |
|       |                                                                                    | 3.Manisha Meena (250/14)        |                       |                                             |
|       |                                                                                    | 4.Mohit Gupta (268/14)          |                       |                                             |

**Best Projects CAYm1 (2018-19)**

| S. NO | Title of the project                                                         | Students                  | Projects Conducted At | Project Guide                                |
|-------|------------------------------------------------------------------------------|---------------------------|-----------------------|----------------------------------------------|
| 1     | Active Disturbance Rejection Control Of First And Second Order System (ADRC) | 1. Akhil Verma 14/15      | N.I.T SRINAGAR        | Dr. M. A. Bazaz                              |
|       |                                                                              | 2. Nawaz Ahmed 23/15      |                       |                                              |
| 2     | PWM Rectifier For Improved Power Quality AC-DC Conversion                    | 1. Rajendra Singh 59/15   | N.I.T SRINAGAR        | Prof. A. H. Bhat                             |
|       |                                                                              | 2. Dharmendra Kumar 67/15 |                       |                                              |
|       |                                                                              | 3. Deepak Rajput 75/15    |                       |                                              |
|       |                                                                              | 4. Saurav Kumar 71/15     |                       |                                              |
|       |                                                                              | 5. Manish Vajpeyi 78/15   |                       |                                              |
| 3     | GSM Based Smart Energy Meter Using Arduino                                   | 1. Gulshan Kumar 74/15    | N.I.T SRINAGAR        | Prof. S. A. Lone and Dr. Farhad Ilahi Bakhsh |
|       |                                                                              | 2. Jaiprakash Patel 77/15 |                       |                                              |
|       |                                                                              | 3. Mukesh 85/15           |                       |                                              |
|       |                                                                              | 4. Rahul 86/15            |                       |                                              |

**Best Projects CAYm1 (2019-2020)**

| S. NO | Title of the project                                | Students              | Projects Conducted At | Project Guide |
|-------|-----------------------------------------------------|-----------------------|-----------------------|---------------|
| 1     | CONTROL OF ROBOTIC ARM TWO-LINK MANIPULATOR BY ADRC | Siddhart Gupta 250/16 | N.I.T SRINAGAR        | Dr Abid Bazaz |
|       |                                                     | Ashish Dular 398/16   |                       |               |

|   |                                                                                             |                               |                   |                                         |
|---|---------------------------------------------------------------------------------------------|-------------------------------|-------------------|-----------------------------------------|
|   |                                                                                             | Priyanka baboria 335/16       |                   |                                         |
| 2 | ACTIVE<br>DISTURBANCE<br>REJECTION<br>CONTROL OF A<br>QUADCOPTOR                            | Tabasum Nazir 127/16          | N.I.T<br>SRINAGAR | Dr Abid Bazaz                           |
|   |                                                                                             | Haseeba Maqbool 183/16        |                   |                                         |
|   |                                                                                             | Raheel Tariq 4/16             |                   |                                         |
| 3 | GREY WOLF<br>OPTIMIZATION<br>ALGORITHM FOR<br>OPTIMAL SITING<br>AND SIZING OF<br>CAPACITORS | Aftab 403/16                  | N.I.T<br>SRINAGAR | Dr Kushal Jagtap                        |
| 4 | MODULATION<br>TECHNIQUES FOR<br>1ph-3ph MATRIX<br>CONVERTERS                                | Adarsh Kumar 10/16            | N.I.T<br>SRINAGAR | Ms Tabish Mir and<br>Prof A H Bhat (Co) |
|   |                                                                                             | Kavish Sitholiwal 332/16      |                   |                                         |
|   |                                                                                             | Shivanshu Tripathi 105/16     |                   |                                         |
|   |                                                                                             | Ankit Kumar 396/16            |                   |                                         |
| 5 | CONTROL<br>TECHNIQUES FOR<br>'CUK CONVERTER'.                                               | Javaid Ahmad Rashi<br>137/16  | N.I.T<br>SRINAGAR | Ms Tabish Mir and<br>Prof A H Bhat (Co) |
|   |                                                                                             | Ubaid Bashir Wani 308/16      |                   |                                         |
|   |                                                                                             | Aadil Hussain Hajam<br>290/16 |                   |                                         |
|   |                                                                                             | Rohit Kumar Shah 11/16        |                   |                                         |

**Projects Carried Out Outside the College**  
**Best Projects CAYm3(2016-17)**

| S. NO | Title of the project            | Students                        | Projects Conducted At | Project Guide          |
|-------|---------------------------------|---------------------------------|-----------------------|------------------------|
| 1     | Meter data acquisition systems. | Mohd. Numaan Rather (43/11)     | PDD, J&K              | Dr. Shameem Ahmad Lone |
|       |                                 | Abdul Waris (70/11)             |                       |                        |
| 2     | Energy Audit and accounting.    | Mr. Kaisar Jan (381/11)         | PDD, J&K              | Dr. Shameem Ahmad Lone |
|       |                                 | Mr. Ishfaq Majid (90/11)        |                       |                        |
|       |                                 | Mr. Arif Hussain Najar (124/11) |                       |                        |

**Evidences of papers published /Awards received by projects etc. (3)**

| S. NO | Title of the project                                                   | Students      | Papers published in | Guide                |
|-------|------------------------------------------------------------------------|---------------|---------------------|----------------------|
| 1     | Direct torque control of induction motor drive with flux optimization. | Hadhiq Khan   | IEEE                | Dr. Mohd. Abid Bazaz |
|       |                                                                        | Shoeb Hussain |                     |                      |

**2.2.4. Initiatives related to industry interaction (10)**

*(Give details of the industry involvement in the program such as industry-attached laboratories, partial delivery of appropriate courses by industry experts etc. Mention the initiatives, implementation details and impact analysis)*

**Industry Supported Laboratories:**

- ❖ The industry supported laboratories develops best learning process using a comprehensive understanding of industry's best practices for both students and faculty.
  - ❖ To strengthen interaction with industries and to keep our students are updated with the latest trends in Electrical Engineering.
1. Industry interactions help the students to acquire the practical knowledge. So in order to improve the technical abilities various industrial activities are carried out.

The Department has entered into an agreement with the following companies/Institution

MOUs Signed by N.I.T Srinagar N.I.T Srinagar signed MOU with

- ❖ National Innovation Foundation-India, Ahmadabad
- ❖ I.I.T Roorkee
- ❖ N.I.T Silchar
- ❖ N.I.T Durgapur
- ❖ N.I.T Jalandhar
- ❖ N.I.T Hamirpur
- ❖ Central Glass & Ceramic Research Institute (CGCRI) Kolkata
- ❖ N.I.T Surat
- ❖ National Institute of Hydrology Roorkee
- ❖ MNNIT Allahaba
- ❖ ALTTC BSNL Ghaziabad

**Faculty Industry interaction:** Guest lectures by various industry Experts for Partial delivery of the Courses

A few special lectures were organized by the department during the assessment years which include:

- ‘Solar Photovoltaic System- Role of Power Electronics’ on 29<sup>th</sup> of April, 2017 by Prof. Zainul Salam, Professor, Centre of Electrical Engineering Systems (CEES), Universiti Teknologi Malaysia.
- ‘How to Publish Research Work in High Impact Journals’ on 1<sup>st</sup> of May 2017 by Prof. Zainul Salam, Professor, Centre of Electrical Engineering Systems (CEES), Universiti Teknologi Malaysia.

**Industry involvement in the partial delivery of any regular courses for students.**

To strengthen interaction with industries and to keep our students updated with the latest trends in Electrical Engineering, the Department undertakes technical visits to industries around and power stations/generating station/ grid stations etc to practice aspects of various course contents.(Couse No: PSP- 701P, PSP- 701, PSP -704)

**Implementation**

| Sl. No | Event                                                                      | Name of the Organization                           | Date/ Period                                  | Status     |
|--------|----------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------|------------|
| 1      | 2-days workshop on MATLAB                                                  | MATHWORKS                                          | 5 <sup>th</sup> to 6 <sup>th</sup> March 2017 | Successful |
| 2.     | One Week Short Term Course on Renewable Energy In Science, Engineering and | Department of Electrical Engineering, NIT Srinagar | 1st to 5th July, 2019                         | Successful |

|     |                                                                                                            |                                                    |                          |            |
|-----|------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------|------------|
|     | Technology-2019                                                                                            |                                                    |                          |            |
| 3.  | One Week Short Term Course on Introduction to MATLAB, PSCAD and LaTeX for Researchers                      | Department of Electrical Engineering, NIT Srinagar | 24th to 28th April, 2019 | Successful |
| 4.  | One week Workshop on Power electronics: Applications in Renewable Energy Systems                           | Department of Electrical Engineering, NIT Srinagar | 22nd to 26th April, 2019 | Successful |
| 5.  | One Week Workshop on Introduction and Basics of Programming skill using MATLAB and PYTHON                  | Department of Electrical Engineering, NIT Srinagar | 27th to 31st May, 2019   | Successful |
| 6.  | Two Day Workshop on Scientific and Technical Documentation Using LATEX                                     | Department of Electrical Engineering, NIT Srinagar | 8th to 9th June, 2019    | Successful |
| 7.  | Basic Programming Skill Using MATLAB and PHYTHON                                                           | Department of Electrical Engineering NIT Srinagar  | 8th -9th June,2019       | Successful |
| 8.  | Introduction to MATLAB, PSCAD and LaTeX for researchers under TEQIP-III                                    | Department of Electrical Engineering NIT Srinagar  | 24th -28th June,2019     | Successful |
| 9.  | One week STC on “Renewable Energy in Science, Engineering and Technology (RESET-2019)”                     | Department of Electrical Engineering NIT Srinagar  | 1st -5th July,2019       | Successful |
| 10. | One-week Online Faculty Development Program on Soft Computing Techniques - 2020 (SCT-2020) under TEQIP-III | Department of Electrical Engineering NIT Srinagar  | 25th -30th July, 2020    | Successful |
| 11. | One Week STC on Application of Artificial Intelligence in Electrical Energy Systems                        | Department of Electrical Engineering NIT Srinagar  | 17th -21st August, 2020  | Successful |
| 12. | One-week STC on “Recent Techniques in Condition Monitoring of                                              | Department of Electrical Engineering NIT Srinagar  | 7th -11th Sept,2020      | Successful |

|     |                                                                                                                                  |                                                   |                       |            |
|-----|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------|------------|
|     | Electrical Apparatus”.                                                                                                           |                                                   |                       |            |
| 13. | One-week STC on “Large Scale Grid Integration of renewable sources; Challenges, issues, modelling and solutions” under TEQIP-III | Department of Electrical Engineering NIT Srinagar | 23rd -27th Sept,2020  | Successful |
| 14. | One week e-Workshop on “Smart Power & Energy Systems”                                                                            | Department of Electrical Engineering NIT Srinagar | 30th Oct-3rd Nov,2020 | Successful |
| 15. | One week workshop on “Application of MATLAB in Engineering Applications”                                                         | Department of Electrical Engineering NIT Srinagar | 26th -30th Nov, 2020  | Successful |
| 16. | One week e-Workshop on “Power System Control – A Smart Approach”                                                                 | Department of Electrical Engineering NIT Srinagar | 11th -15th Dec, 2020  | Successful |

#### **Impact analysis of industry-institute interaction and actions are taken thereof.**

- The effectiveness of this practice can be gauged by the great response of the participants of the workshops.
- Students picked up what they learned at the workshops to implement their own final year projects.
- Students gained from this exposure to incorporate an entrepreneurial spirit and project-based thinking.
- The students are provided with the feedback forms to rate their industrial training/internship. It is done to identify the level of achievement.
- The feedback is obtained from students at the end of 8<sup>th</sup> semester to assess the achievement of the objectives of the industrial training/ summer training/internship/ industrial tour.

#### **2.2.5 Initiatives related to industry internship/summer training (10)**

##### **Objectives:**

- ❖ Internship is introduced to make the students to expose to different environment
- ❖ It makes the students to know the industrial /real time problems
- ❖ It helps the students in solving/understanding real-life problems through application of engineering analysis, design, evaluation and creation.
- ❖ It changes the behavioural aspects of student and make him/her ready to face Industry

- ❖ It provides a good platform on the job training to the students and to develop a network which will be useful in enhancing their career prospects.

#### **Initiatives:**

- ❖ Identification of relevant Electrical Engineering by Communicating with the companies through stake holders.
- ❖ Inviting the companies for internship cum placement drive.
- ❖ Orientation by HOD and directorate of Internships before sending student to industry.
- ❖ Distribution of Internship manuals and Internship Allotment orders to the students.

#### **Impact Analysis:**

1. The attitude, knowledge and skills of students are improved so that they can be fit into any kind of organizations.
2. The ability to apply was improved with internship program, as where they applied theoretical knowledge what they learnt in the class room.
3. Practical knowledge was improved through which they have elevated their career opportunities.
4. Placement opportunities were improved.

#### **Industrial training/tours for students (2)**

The faculties of the department constantly try to interact with industries like PDC, PDD of J&K Govt, etc. for industrial visit.

| Sl. No. | Name of the Site                         | Date of Visit |
|---------|------------------------------------------|---------------|
| 1       | LOWER JHELM POWER PROJECT,<br>BARAMULLAH | 31/10/2015    |
| 2       | UPPER SIND HYDEL PROJECT,<br>KANGAN      | 14/06/2015    |
| 3       | URI POWER STATION, GINGLE                | 17/09/2015    |
| 4       | LOWER JHELM POWER PROJECT,<br>BARAMULLAH | 27/09/2017    |

#### **Industrial /Internship /summer training of more than two weeks and post-training Assessment.**

The students are encouraged to take up internship programs during their semester break. Faculty members give their guidelines, suggestions and scope and contact details of an internship. They also help the students by interacting with the industry experts; provide the

student's recommendation letters and other necessary supports. The alumni coordinator constantly interacts with alumni those who are working in the industries and request them to provide the necessary guidelines and supports for their junior's internship.

| SL. NO | NAME OF THE STUDENT                                    | CERTIFICATION / TRAINING DETAILS | ORGANIZATION                                 | DURATION | DATE                 |
|--------|--------------------------------------------------------|----------------------------------|----------------------------------------------|----------|----------------------|
| 1.     | Adil Mohi-u-Din Bhat (155/11)                          | In-Plant Training                | PGCIL, 400/220 KV Wagoora substation         | 51 days  | 26/12/13 to 14/2/14  |
| 2.     | Shahid Hussain Kumar (82/11)<br>Suhail Majeed (122/11) | In-Plant Training                | Upper Sind Hydro Electric Stage-II, Kangan   | 8 weeks  | 05/02/14             |
| 3.     | Junaid Farooq (126/11)                                 | In-Plant Training                | Uri Power Station, Gingle, Baramulla         | 62 days  | 15/12/13 to 15/02/14 |
| 4.     | Rajbir Singh (62/11)                                   | In-Plant Training                | PGCIL, 400/220 KV Wagoora substation         | 51 days  | 26/12/13 to 14/2/14  |
| 5.     | Mr. Mohd Umar Farooq (118/11)                          | In-Plant Training                | 200 MVA, 132/33 KV Grid Station Pampore      | 64 days  | 13/12/13 to 14/02/14 |
| 6.     | Md. Mozahir Hassan (474/11)                            | In-Plant Training                | IOCL, Barauni Oil Refinery, Begusarai, Buhar | 42 days  | 21/12/13 to 31/01/14 |
| 7.     | Tariq Aziz Sofi                                        | In-Plant Training                | BHEL, Haridwar                               | 47 days  | 16/12/13 to 31/1/14  |
| 8.     | Sh.Aaqib Ali Abbas (205/12)                            | In-Plant Training                | PGCIL, 400/220 KV Wagoora substation         | 43 days  | 15/12/14 to 26/01/15 |
| 9.     | Burhanul Majeed (223/12)                               | In-Plant Training                | Lower Jhelum Hydel Project, J&K              | 64 days  | 22/12/14 to 24/02/15 |
| 10.    | Abid Hussain Lone                                      | In-Plant Training                | 132/33 KV Grid Station Wanpoh                | 46 days  | 01/01/15 to 15/02/15 |
| 11.    | Gowhar Ahmad Mir (225/12)                              | In-Plant Training                | Lower Jhelum Hydel Project, J&K              | 64 days  | 22/12/14 to 24/02/15 |
| 12.    | Gaurangi Gargi Chowdhary (39/15)                       | In-Plant Training                | IISc, Bangalore                              | 53 days  | 20/12/17 to 10/02/18 |

|     |                        |                   |                                             |          |                           |
|-----|------------------------|-------------------|---------------------------------------------|----------|---------------------------|
| 13. | Aditya Ujjawal (57/15) | In-Plant Training | BHEL, Haridwar                              | 28 days  | 23/12/17 to 19/1/18       |
| 14. | Abid Hussain (26/15)   | In-Plant Training | Salal power station, Jyotipuram (NHPC Ltd.) | 29 days  | 23/01/18 to 20/02/18      |
| 15. | Rohit Choor (22/15)    | In-Plant Training | DMRC                                        | 27 days  | 13/12/17 to 08/01/18      |
| 16. | Swastik Sharma         | In-Plant training | BSNL Ghaziabad                              | 4 weeks  | 15/07/19 to 09/08/19      |
| 17. | Ayush Dogra            | In-Plant training | BSNL Ghaziabad                              | 4 weeks  | 15/07/19 to 09/08/19      |
| 18. | Shubam Pal             | In-Plant training | BSNL Ghaziabad                              | 4 weeks  | 15/07/19 to 09/08/19      |
| 19. | Abhishek Kumar         | In-Plant training | BSNL Ghaziabad                              | 4 weeks  | 15/07/19 to 09/08/19      |
| 20. | Harinath Prajapati     | In-Plant training | BSNL Ghaziabad                              | 4 weeks  | 15/07/19 to 09/08/19      |
| 21. | Sudhir Kumar           | In-Plant training | BSNL Ghaziabad                              | 4 weeks  | 15/07/19 to 09/08/19      |
| 22. | Atanu Gain             | In-Plant training | BSNL Ghaziabad                              | 4 weeks  | 11/07/19 to 09/08/19      |
| 23. | Gautam Kishore         | In-plant training | NTPC                                        | 1 month  | 23/12/2015 to 23/01/16    |
| 24. | Vivek Vikram Singh     | In-plant training | NTPC badarpur                               | 40 days  | 22/12/2014 to 31/01/2015  |
| 25. | Harsh Prasad           | In-plant training | Usha Martin Ranchi                          | 6 weeks  | 05/01/2015 to 19/02/2015  |
| 26. | Chirag Gupta           | In-plant training | Reliance industries                         | 45 days  | 15/12/2014 to 30/01/2015  |
| 27. | Dinesh Saini           | In-plant training | KSTPS-KOTA                                  | 6 weeks  | 22/12/2014 to 05/02/2015  |
| 28. | Rahul Prajapati        | In-plant training | KCK thermal training institute rajasthan    | 33 days  | 28/12/2015 to 30/01/2016  |
| 29. | Rahul Kumar            | In-plant training | NHPC SALAL                                  | 25 days  | 11/01/2016 TO 05/02/2016  |
| 30. | Neeraj Kumar           | In-plant training | NHPC SALAL                                  | 5 weeks  | 28/12/2015 to 03/02 /2015 |
| 31. | Rakesh Kumar           | In-plant training | North Western Railways Jaipur               | 28 days  | 28/12/2015 to 25/01/2016  |
| 32. | Gaurav Kishore         | In-plant training | NTPC Barh                                   | 1 month  | 23/12/2015 to 23/01/2016  |
| 33. | Anamika Chakrabarty    | In-plant training | IOCL Gujrat                                 | 39 days  | 22/12/2014 to 31/01/2015  |
| 34. | Anshul                 | In-plant training | NTPC Badarpur                               | 09 weeks | 08/12/2015 to             |

|     |                       |                   |                                                             |                 |                          |
|-----|-----------------------|-------------------|-------------------------------------------------------------|-----------------|--------------------------|
|     | Sharma                |                   |                                                             |                 | 12/02/2016               |
| 35. | Mohd Irfan Malik      | In-plant training | NHPC salal                                                  | 6 weeks         | 23/12/2015 to 03/02/2016 |
| 36. | Rahul Kumar           | In-plant training | HP Enterprise Noida                                         | 4 weeks         | 21/01/2016 to 19/02/2016 |
| 37. | Akhilesh Kumar        | In-plant training | NTPC Noida                                                  | 1 month         | 15/12/2015 to 15/01/2016 |
| 38. | Amit Kashyap          | In-plant training | PDD Gladni Jammu                                            | 4 weeks         | 09/01/2016 to 09/02/2016 |
| 39. | Vivek Kumar Singh     | In-plant training | Ultra tech cements kotputli                                 | 2 months        | 24/12/2015 to 24/02/2016 |
| 40. | Ali Akbar             | In-plant training | PGCIL Samba                                                 | 6 weeks         | 10/01/2015 to 24/02/2015 |
| 41. | Neha Dogra            | In-plant training | PDD Gladni Jammu                                            | 4 weeks         | 09/01/2016 to 09/02/2016 |
| 42. | Ayush kumar           | In-plant training | NTPC Badarpur                                               | 39 days         | 22/12/2014 to 31/01/15   |
| 43. | Sinan Aquib Gull      | In-plant training | Advanced tech india ltd                                     | 6 weeks         | 15/01/2016 to 27/02/2016 |
| 44. | Rajeev Kumar          | In-plant training | NTPC Barh                                                   | 1 month         | 15/12/2015 to 15/01/2016 |
| 45. | Manohar kumar         | In-plant training | NTPC Barh                                                   | 1 month         | 15/12/2015 to 15/01/2016 |
| 46. | Mohammad Muneer Dar   | In-plant training | PGCIL                                                       | 4 weeks/1 month | 20/12/2019 to 10/2/20    |
| 47. | Sahib Dawood          | In-plant training | CSIR - CSIO                                                 | 4 weeks/1 month | 26/12/2019 to 6/2/2020   |
| 48. | Rather Aadil Ahmad    | In-plant training | CSIR Chandigarh                                             | 4 weeks/1 month | 26/12/2019 to 6/2/2020   |
| 49. | SHAHID NAZIR AHANGER  | In-plant training | PGCIL WAGOORA                                               | 4 weeks/1 month | 26/12/2019 to 6/2/2020   |
| 50. | Mayur Ameriya         | In-plant training | BHEL HARIDWAR. IOCL BARAUNI REFINERY                        | 4 weeks/1 month | 1/1/2020 to 30/1/2020    |
| 51. | Muneeb Mushtaq Sheikh | In-plant training | PGCIL New Wanpoh Kashmir                                    | 4 weeks/1 month | 18/11/2020 to 16/12/2020 |
| 52. | Aditya Avi            | In-plant training | IOCL , Barauni                                              | 4 weeks/1 month | 1/1/2020 to 30/1/2020    |
| 53. | Aditya Avi            | In-plant training | BHEL, Haridwar                                              | 4 weeks/1 month | 5/9/2019 to 4/10/2019    |
| 54. | Ramhari Yadav         | In-plant training | NHPC Limited Faridabad, Department of Aerospace Engineering | 4 weeks/1 month | 3/9/2019 to 26/10/2019   |

|     |                      |                   |                                                                    |                 |                          |
|-----|----------------------|-------------------|--------------------------------------------------------------------|-----------------|--------------------------|
|     |                      |                   | IISc Bangalore, PGCIL Allahabad                                    |                 |                          |
| 55. | Dheeraj Kumar        | In-plant training | Bharat Heavy Electricals limited (BHEL) Haridwar                   | 4 weeks/1 month | 9/9/2019 to 8/10/2019    |
| 56. | Saurav Kumar         | In-plant training | Sagacious IP                                                       | 4 weeks/1 month | 4/1/2021 to 1/3/2021     |
| 57. | Saurav Kumar         | In-plant training | Sail Bokaro, BHEL Haridwar , Mithla Motors                         | 4 weeks/1 month | 17/12/2018 to 12/1/2019  |
| 58. | VISHAL KATIYAR       | In-plant training | BHEL HARIDWAR                                                      | 4 weeks/1 month | 7/9/2019 to 6/10/2019    |
| 59. | Hanzal Manzoor       | In-plant training | PGCIL Wagoora                                                      | 4 weeks/1 month | 20/12/2019 to 10/2/20    |
| 60. | SHIV SAGAR MEENA     | In-plant training | BHARAT HEAVY ELECTRICALS LIMITED, RANIPUR, HARIDWAR                | 4 weeks/1 month | 9/9/2019 to 8/10/2019    |
| 61. | AMIT KUMAR PRAJAPATI | In-plant training | Power grid(pgcil)                                                  | 4 weeks/1 month | 26/12/2019 to 25/1/2020  |
| 62. | Aditya Sadhotra      | In-plant training | BHEL                                                               | 4 weeks/1 month | 7/9/2019 to 6/10/2019    |
| 63. | Sofi Abdul Waheed    | In-plant training | IIT DELHI                                                          | 4 weeks/1 month | 1/1/2020 to 10/2/2020    |
| 64. | Rishabh Kumar Sharma | In-plant training | NTPC , Western Central Railways, CSIR-CSIO , Joy of giving Society | 4 weeks/1 month | 19/12/2018 to 18/01/2019 |
| 65. | Moonisa yousuf       | In-plant training | JKPTCL                                                             | 4 weeks/1 month | 20/12/2019 to 15/2/20    |
| 66. | Yawer Sultan         | In-plant training | PGCIL                                                              | 4 weeks/1 month | 20/12/2019 to 10/2/20    |
| 67. | Shahid qadir         | In-plant training | PGCIL                                                              | 4 weeks/1 month | 20/12/2019 to 10/2/20    |
| 68. | Mohammad Salik       | In-plant training | Electrical Engineering Department, IIT Delhi                       | 4 weeks/1 month | 1/1/2020 to 10/2/2020    |
| 69. | Sahib Dawood         | In-plant training | Bharat Heavy Electricals Limited Haridwar                          | 4 weeks/1 month | 9/9/2019 to 8/10/2019    |
| 70. | Sanjay Kumar Bhagat  | In-plant training | Bharat Heavy Electricals Limited                                   | 4 weeks/1 month | 7/9/2019 to 6/10/2019    |
| 71. | Ravi shankar         | In-plant training | IISc bangalore                                                     | 4 weeks/1 month | 05/9/2019 to 4/10/2019   |
| 72. | Nitesh Yadav         | In-plant training | BHEL(BHARAT HEAVY ELECTRICALS LIMITED)                             | 4 weeks/1 month | 9/9/2020 to 8/10/2020    |
| 73. | Jawahar Bashir       | In-plant training | Jkptc Bemina                                                       | 4 weeks/1 month | 20/1/2020 to 1/3/2020    |

|     |                 |                   |                                         |                 |                        |
|-----|-----------------|-------------------|-----------------------------------------|-----------------|------------------------|
| 74. | Vishal dwivedi  | In-plant training | BHEL                                    | 4 weeks/1 month | 26/12/2019 to 6/2/2020 |
| 75. | Amir ahmad baba | In-plant training | Power grid corporation of india limited | 4 weeks/1 month | 20/12/2019 to 10/2/20  |

### Impact analysis of industrial training

- ❖ The purpose of those internships is not only to get acquainted with the culture of companies but also to realize something of importance for the company visited.
- ❖ Working in a group within the company, it is expected that the trainee gets a better insight into the practical aspects of the industry.

### SUMMARY:

| Criteria           | Sub-Criteria | Max. score | Obtained /Claimed score |
|--------------------|--------------|------------|-------------------------|
| <b>2.1</b>         | 2.1.1        | 10         | 10                      |
|                    | 2.1.2        | 5          | 5                       |
|                    | 2.1.3        | 5          | 5                       |
|                    | 2.1.4        | 10         | 10                      |
| <b>2.2</b>         | 2.2.1        | 15         | 15                      |
|                    | 2.2.2        | 15         | 15                      |
|                    | 2.2.3        | 20         | 20                      |
|                    | 2.2.4        | 10         | 10                      |
|                    | 2.2.5        | 10         | 10                      |
| <b>Total score</b> |              | <b>100</b> | <b>100</b>              |

**Marks claimed: 100 out of 100**