

Attainment of POs, PSOs, COs

3.1. Establish the correlation between the courses and the Program Outcomes (POs) & Program Specific Outcomes (PSOs)

- NBA defined Program Outcomes as mentioned in Annexure I and Program Specific Outcomes as defined by the Program. Six to ten matrices of core courses are to be mentioned with at least one per semester.

Select core courses to demonstrate the mapping/correlation with all POs and PSOs.

- Number of Outcomes for a Course is expected to be around 6.

The curriculum of the program is designed with core and elective courses by considering vision, mission, program educational objectives, program outcomes, and program specific outcomes. Course outcomes are statements that are in the view of what the students are expected to attain at the end of the course. Course outcomes are mapped depending on its significance to POs and PSOs.

FORMULATION OF PROGRAM ARTICULATION MATRIX:

Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation.

If course outcomes are attained, the POs correlated to these COs are also attained.

Courses taken for articulation matrix (2015-2019 Batch)

| Sl. No. | Course Code | Name of the Course | Semester |
|----------------|--------------------|--|-----------------|
| 1. | C212 | EC219 - Electronic Devices and Circuits | 03 |
| 2. | C213 | EC221 - Signals and Systems | 03 |
| 3. | C223 | EC228 - Digital Electronics | 04 |
| 4. | C224 | EC230 - Analog Communication | 04 |
| 5. | C312 | EC319 - Microprocessors and Microcontrollers | 05 |
| 6. | C313 | EC321 - Digital Communications | 05 |
| 7. | C321 | EC320 - VLSI Design | 06 |
| 8. | C322 | EC322 - Antenna and Wave Propagation | 06 |
| 9. | C412 | EC433 -RF and Microwave Engineering | 07 |
| 10. | C413 | EC435 -Electronic Measurements and Instrumentation | 07 |

PROGRAM ARTICULATION MATRIX

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------|------|------|------|------|------|------|-----|-----|------|------|------|------|------|------|------|
| C212 | 2.50 | 2.50 | 2.33 | 3.00 | - | - | - | - | - | - | - | 1.67 | - | - | 2.00 |
| C213 | 3.00 | 2.00 | - | 1.33 | - | - | - | - | - | - | - | 2.00 | 3.00 | - | - |
| C223 | 2.25 | 2.00 | 3.00 | 1.00 | - | - | - | - | - | - | - | - | 1.33 | 1.75 | 2.00 |
| C224 | 2.00 | 2.00 | 1.33 | 1.33 | 1.00 | 1.00 | - | - | 1.00 | - | - | 1.00 | 2.00 | - | - |
| C312 | 2.75 | 2.25 | 1.50 | 2.00 | - | - | - | - | - | - | - | - | - | 2.75 | - |
| C313 | 2.25 | 2.25 | - | 2.00 | - | - | - | - | - | - | - | - | 2.00 | - | - |
| C321 | 2.25 | 1.67 | 3.00 | 3.00 | 3.00 | - | - | - | - | - | - | - | - | - | 3.00 |
| C322 | 2.25 | 2.00 | - | 2.00 | - | - | - | - | - | - | - | - | 3.00 | - | - |
| C412 | 2.25 | 2.50 | - | 2.00 | - | - | - | - | - | - | - | - | 3.00 | - | - |
| C413 | 2.75 | 2.00 | 1.00 | 1.00 | - | - | - | - | - | - | - | - | 1.50 | 2.33 | - |

FORMULATION OF COURSE ARTICULATION MATRIX:

Course Articulation Matrix correlates the individual COs of a course with POs and PSOs.

The strength of correlation is indicated as 3 for substantial (high) 2 for correlation, moderate (medium) correlation, and 1 for slight (low) correlation.

COURSE OUTCOMES:

| Course | Name of the Course | Course Outcomes |
|--------|---|---|
| C212 | EC219 - Electronic Devices and Circuits | Upon successful completion of this course, students should be able to: CO1: Outline the semiconductor devices with the help of characteristics. CO2: Illustrate the characteristics of Amplifier Circuits employing BJT and FET devices. CO3: Analyze half wave and full wave rectifiers with and without filters. CO4: Compare the working of BJTs and FETs under various biasing conditions. |
| C213 | EC221 - Signals and Systems | Upon successful completion of this course, students should be able to: CO1: Explain the basic signals and their representation using Fourier series. CO2: Apply the concept of transform techniques, convolution and correlation for continuous time signals. CO3: Evaluate the step, impulse and system response of a LTI System to arbitrary inputs. CO4: Elaborate the sampling theorem for discretization and reconstruction. |
| C223 | EC228 - Digital Electronics | Upon successful completion of this course, students should be able to: CO1: Apply the Boolean algebra knowledge of mathematics to analyze combinational and sequential digital electronic circuits using K-map and QM technique. CO2: Classify the different combinational circuits for the given specifications/constraints. CO3: Analyse the sequential circuits for the given specifications/constraints. CO4: Compare the characteristics of logic families for implementing combinational & sequential circuits. |

| | | |
|------|--|---|
| C224 | EC230 - Analog Communication | <p>Upon successful completion of this course, students should be able to:</p> <p>CO1: Outline different amplitude modulation techniques.</p> <p>CO2: Analyze performance of different types of Angle Modulation techniques for a given set of parameters.</p> <p>CO3: Explain the transmitter and receiver types required for given applications.</p> <p>CO4: Examinethe calculation of SNR in different modulation techniques.</p> |
| C312 | EC319 - Microprocessors and Microcontrollers | <p>Upon successful completion of this course, students should be able to:</p> <p>CO1: Explain the architectures of 8086 microprocessors and 8051 micro controllers.</p> <p>CO2: Outline hardware features and interfacing of memory with 8086.</p> <p>CO3: Apply the concept of various communication interfaces to 8086.</p> <p>CO4: Analyse the inbuilt components of 8051.</p> |
| C313 | EC321 - Digital Communications | <p>Upon successful completion of this course, students should be able to:</p> <p>CO1: Relate the model of digital communication system and its performance.</p> <p>CO2: Show the performance of digital modulation techniques.</p> <p>CO3: Explain the concepts of information theory and source coding.</p> <p>CO4: Apply error control coding techniques for efficient communication.</p> |
| C321 | EC320 - VLSI Design | <p>Upon successful completion of this course, students should be able to:</p> <p>CO1: Explain different models of HDL.</p> <p>CO2: Outline the fabrication process of different MOS technologies.</p> <p>CO3: Analyse the operation and Electrical behaviour of MOS transistors.</p> <p>CO4: Design VLSI circuits and Layouts of MOS circuits using Lambda based design rules andsub-systems using various logic methods.</p> |
| C322 | EC322 - Antenna and Wave Propagation | <p>Upon successful completion of this course, students should be able to:</p> <p>CO1: Apply the concepts and properties of Electro-Magnetism to obtain parameters of antennas.</p> <p>CO2:Analyze the different array techniques to improve directivity.</p> |

| | | |
|------|--|---|
| | | <p>CO3: Determine the antenna characteristics for various applications.</p> <p>CO4: Examine the characteristics of radiowaves and their propagation in the atmosphere.</p> |
| C412 | EC433 -RF and Microwave Engineering | <p>Upon successful completion of this course, students should be able to:</p> <p>CO1. Explain microwave amplifiers and oscillators basic operation, characteristics, parameters, limitations.</p> <p>CO2: Apply concepts of scattering parameters to various microwave components.</p> <p>CO3: Analyze microwave linear beam tubes and cross field tubes.</p> <p>CO4: Determine the various microwave parameters.</p> |
| C413 | EC435 -Electronic Measurements and Instrumentation | <p>Upon successful completion of this course, students should be able to:</p> <p>CO1: Find the specifications of sensors and instruments using statistical approach.</p> <p>CO2: Explain AC and DC bridges.</p> <p>CO3: Summarize various signal generators, spectrum analyzer, sensors and transducers.</p> <p>CO4: Examine the working principles of various display devices and signal conditioning circuits.</p> |

COURSE ARTICULATION MATRIX

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-----|-----|-------------|------|------|-------------|-------------|-------------|-------------|
| C212.1 | 3 | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - | 2 |
| C212.2 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | - | | - | - | 2 |
| C212.3 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | 2 | - | - | 2 |
| C212.4 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 1 | - | - | 2 |
| C212 | 2.50 | 2.50 | 2.33 | 3.00 | - | - | - | - | - | - | - | 1.67 | - | - | 2.00 |
| C213.1 | 3 | 2 | - | 1 | - | - | - | - | - | - | - | - | 3 | - | - |
| C213.2 | 3 | 3 | - | 1 | - | - | - | - | - | - | - | - | 3 | - | - |
| C213.3 | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 3 | - | - |
| C213.4 | 3 | 1 | - | - | - | - | - | - | - | - | - | 2 | 3 | - | - |
| C213 | 3.00 | 2.00 | - | 1.33 | - | - | - | - | - | - | - | 2.00 | 3.00 | - | - |
| C223.1 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 2 |
| C223.2 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | - | - | 2 | 2 |
| C223.3 | 2 | 3 | 3 | 1 | - | - | - | - | - | - | - | - | 1 | 2 | 2 |
| C223.4 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 2 |
| C223 | 2.25 | 2.00 | 3.00 | 1.00 | - | - | - | - | - | - | - | - | 1.33 | 1.75 | 2.00 |
| C224.1 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | 2 | - | - |
| C224.2 | 2 | 3 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | 3 | - | - |
| C224.3 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| C224.4 | 1 | 2 | - | 2 | 1 | - | - | - | 1 | - | - | 1 | 1 | - | - |
| C224 | 2.00 | 2.00 | 1.33 | 1.33 | 1.00 | 1.00 | - | - | 1.00 | - | - | 1.00 | 2.00 | - | - |

| | | | | | | | | | | | | | | | |
|---------------|-------------|-------------|-------------|-------------|---|---|---|---|---|---|---|---|-------------|-------------|---|
| C322 | 2.25 | 2.00 | - | 2.00 | - | - | - | - | - | - | - | - | 3.00 | - | - |
| | | | | | | | | | | | | | | | |
| C412.1 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 3 | - | - |
| C412.2 | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 3 | - | - |
| C412.3 | 2 | 3 | - | 2 | - | - | - | - | - | - | - | - | 3 | - | - |
| C412.4 | 2 | 3 | - | 2 | - | - | - | - | - | - | - | - | 3 | - | - |
| C412 | 2.25 | 2.50 | - | 2.00 | - | - | - | - | - | - | - | - | 3.00 | - | - |
| | | | | | | | | | | | | | | | |
| C413.1 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 1 | 2 | - |
| C413.2 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| C413.3 | 3 | - | 1 | - | - | - | - | - | - | - | - | - | - | 2 | - |
| C413.4 | 3 | - | - | 1 | - | - | - | - | - | - | - | - | 2 | 3 | - |
| C413 | 2.75 | 2.00 | 1.00 | 1.00 | - | - | - | - | - | - | - | - | 1.50 | 2.33 | - |

3.2. Attainment of Course Outcomes

3.2.1. Describe the assessment tools and processes used to gather the data upon which the evaluation of Course Outcome is based

Assessment process used to collect the data for evaluation course outcomes can be categorized into two types.

1. External Assessment (End Examinations)
2. Internal Assessment (Internal Evaluation)

Course assessment process starts with the collection of data from internal and external examinations.

The details are given in the following table.

Course outcome assessment process

| Assessment Tool | External | Internal |
|-------------------------------------|---|---|
| Theory course | Semester End Examination | Weekly Test Examination Mid Examination |
| Lab course | Semester End Examination - Practical | Continuous Evaluation (Day to day work and Record) Practical - Internal - Examination |
| Seminar course | - | Internal review |
| Mini project/ Project/Internship | Viva - Voce | Internal reviews |

The step by step process for assessing course outcomes are

Step 1: The Course coordinator analyses each course outcome into elements (different abilities specified in the outcome) and a set of attributes defined for each element (actions that explicitly demonstrate mastery of the abilities specified).

Step 2: Identify/select courses syllabus that address the outcome (each unit in syllabus contributes to atleast one of the outcomes).

Step 3: For each course outcome, define performance indicators (Assessment criteria) and their targets.

Step 4: The course coordinator (senior faculty member taking course) collects the qualitative and quantitative data and analyze the collected data. If the assessed data meets the performance targets which are specified in step 3, the outcome is attained. Otherwise, consider Step 5.

Step 5: The department advisory board (Consist of HoD, senior faculty and Coordinator) recommends content delivery methods/ course outcomes/curriculum improvements as needed.

COURSE OUTCOMES ASSESSMENT TOOLS:

Attainment of Course Outcomes (COs) are narrower statements that describe what students are expected to know, and be able to do at the end of each course.

In Electronics and Communication Engineering Department, the CO attainment levels are measured based on the results of the cumulative internal examinations and semester end examination conducted by the university. This is a form of direct measurement of attainment.

i) The assessment tools for internal examinations are

a) Internal theory marks

Internal theory marks are carried out by each weekly test which are held five or six times for a course in every semester and by the mid-term examinations which are held thrice for a course in every semester.

| Tools used | Frequency (per semester) | Attainment levels |
|-------------------------|-----------------------------|----------------------------------|
| Weekly tests (10 marks) | 5 to 6 | 60% to 69% = 1 70% to 79% = 2 |
| Mid exams (30 marks) | 3 | ≥80% = 3 |

b) Internal lab marks

Laboratory assessment is carried out by conducting one internal examination for each lab course, along with continuous lab evaluation marks for each experiment.

| Tools used | Frequency (per semester) | Attainment levels |
|--------------------------------------|-----------------------------|----------------------------------|
| Continuous lab assessment (10 marks) | 9 to 12 | 60% to 69% = 1 70% to 79% = 2 |
| Internal exam (50 marks) | 1 | ≥80% = 3 |

c) Seminar

The assessment for seminar is carried out by conducting one review in second and third year (3-6 semesters), and it is considered as internal mark for seminar.

| Tools used | Frequency (per semester in second and third years) | Attainment levels |
|-----------------------------|---|--|
| Internal review (100 marks) | 1 | 60% to 69% = 1 70% to 79% = 2 ≥80% = 3 |

d) Internal mini project / project/internship marks

The assessment for mini project is carried out by conducting two reviews in third year (sixth semester), project/internship is carried out during final year (seventh or eighth semester) by conducting two reviews and it is considered as internal mark for mini project/project/internship course.

| Tools used | Frequency (only in sixth semester, final year) | Attainment levels |
|----------------------------|---|---|
| Internal review (25 marks) | 2 | 60% to 69% = 1 70% to 79% = 2 ≥80% =3 |

In each test, the percentage of students who achieve a set target (usually, 60% of the maximum marks) for the COs that are covered is computed. Thus, the average of percentage of students attaining all the COs decides the CO attainment level.

ii) The assessment tools for semester end examinations are

Semester End examination is a metric for evaluating whether the COs are attained or not. Examination is more focused on attainment of course outcomes using a descriptive exam.

e) Semesterend theory marks

Semesterend theory marksare carried out by semester end examinations ofeverysemester.

| Tools used | Frequency (per semester) | Attainment levels |
|---------------------------------|------------------------------------|---|
| End semester exam (60 marks) | 1 | 60% to 69% = 1 70% to 79% = 2 ≥80% =3 |

f) Semester end lab marks

Semester end labmarksare carried out by semester end examinations ofeverysemester.

| Tools used | Frequency (per semester) | Attainment levels |
|---------------------------------|------------------------------------|---|
| End semester exam (50 marks) | 1 | 60% to 69% = 1 70% to 79% = 2 ≥80% =3 |

g) Semesterend mini project/project/internship marks

Semester end mini project mark is carried out by semester end examinations of sixth semester and project/internship marks are carried out by semester end examinations during final year (seventh or eighth semester).

| Tools used | Frequency (only in sixth semester, final year) | Attainment levels |
|---------------------------------|---|--|
| End semester exam (50 marks) | 1 | 60% to 69% = 1 70% to 79% = 2 ≥80% = 3 |

In end exam, the percentage of students who achieve a set target (usually, 40% of the maximum marks) for the COs that are covered is computed. Thus, the average of percentage of students attaining the entire COs decides the CO attainment level.

The overall course Outcome attainment is computed by considering a weightage of 40% for cumulative internal examinations and 60% for end semester examinations.

Attainment Levels:

The attainment levels consider for COs attainments are

- Attainment Level 1: Students attained score in internal and end semester examination in between 60% to 69%.
- Attainment Level 2: Students attained score in internal and end semester examination in between 70% to 79%.
- Attainment Level 3: Students attained score in internal and end semester examination is are greater than or equal to 80%.

In our curriculum, there are four different approaches for the attainment of COs. They are

- i) Theory course – The assessment tools ‘a’ and ‘e’ are considered for overall CO attainment.
- ii) Lab course – The assessment tools ‘b’ and ‘f’ are considered for overall CO attainment.
- iii) Seminar course – The assessment tool ‘c’ is considered for overall CO attainment.
- iv) Mini project/Project/ Internship course – The assessment tools ‘d’, and ‘g’ are considered for overall CO attainment.

Assessment tools frequency table

| Approaches for the attainment of COs | Assessment tools | | | | | | |
|--------------------------------------|------------------|----|-----|----|----|----|----|
| | a | b | c | D | e | f | g |
| Theory course | 50 | - | - | - | 50 | - | - |
| Lab course | - | 50 | - | - | - | 50 | - |
| Seminar course | - | - | 100 | - | - | - | - |
| Mini project/Project/Internship | - | - | - | 50 | - | - | 50 |

The above procedure is followed in evaluating the attainment of COs using existing data from student marks for 2015-19 batch. Each and every test is focused in attaining the course outcomes.

Example:

1. The process of computing assessment tool 'a' of a course C212 (EC219 -Electronic Devices and Circuits, 03 Semester ECE) is shown in below table.

CO assessment based on internal results (Theory)

| Examination Type→ | Weekly Test Examinations | | | | | Mid Term Examinations | | |
|---------------------------------|--------------------------|----------|----------|----------|----------|-----------------------|--------|---------|
| | WT 1 | WT 2 | WT 3 | WT 4 | WT 5 | Mid I | Mid II | Mid III |
| Target | 60% | 60% | 60% | 60% | 60% | 60% | 60% | 60% |
| Max Marks | 10 | 10 | 10 | 10 | 10 | 30 | 30 | 30 |
| Minimum Score Set as Basis | 6 | 6 | 6 | 6 | 6 | 18 | 18 | 18 |
| No. of Students Attended | 320 | 325 | 326 | 317 | 319 | 303 | 329 | 280 |
| No. of Students Attained | 243 | 278 | 268 | 137 | 243 | 257 | 284 | 209 |
| Percentage of Students Attained | 76% | 86% | 82% | 43% | 76% | 85% | 86% | 75% |
| Attainment Level | 2 | 3 | 3 | 0 | 2 | 3 | 3 | 2 |
| COs Attained | | | | | | | | |
| CO 1 | 2 | 3 | | | | 3 | | |
| CO 2 | | | | | | | | 2 |
| CO 3 | | | | 0 | | 3 | 3 | |
| CO 4 | | | 3 | | 2 | | 3 | 2 |
| Result Analysis | | | | | | | | |
| Register Number | WT 1 | WT 2 | WT 3 | WT 4 | WT 5 | Mid I | Mid II | Mid III |
| 141FA05005 | 9 | 9 | 10 | 2 | 9 | -1 | 21 | 26 |
| 151FA05007 | 9 | 10 | -1 | 9 | 10 | 30 | 28 | 30 |
| 151FA05009 | 10 | 9 | 10 | 8 | 10 | 29 | 29 | 28 |
| 151FA05011 | 10 | 10 | 10 | 9 | 9 | 30 | 29 | -1 |

| | | | | | | | | |
|------------|----|----|----|----|----|----|----|----|
| 151FA05015 | 10 | 10 | 9 | 6 | 10 | 26 | 29 | 30 |
| 151FA05030 | 10 | 10 | 10 | 6 | 9 | 28 | 30 | 28 |
| 151FA05046 | 10 | 10 | 10 | 6 | 9 | 24 | 29 | 30 |
| 151FA05050 | 8 | 10 | 10 | 8 | -1 | 27 | 30 | -1 |
| 151FA05052 | 10 | 10 | 10 | 6 | 9 | 29 | 29 | -1 |
| 151FA05056 | 10 | 8 | 10 | 8 | 7 | 28 | 29 | 29 |
| 151FA05058 | 9 | 8 | 9 | 9 | 7 | 26 | 29 | 28 |
| 151FA05061 | 10 | 8 | 10 | 6 | 7 | 25 | 29 | -1 |
| . | | | | | | | | |
| . | | | | | | | | |
| . | | | | | | | | |
| . | | | | | | | | |
| 151FA05297 | 4 | 7 | 9 | 0 | 6 | 15 | 19 | 6 |
| 151FA05309 | 6 | 8 | 7 | 2 | 8 | 22 | 23 | 23 |
| 151FA05315 | 3 | 2 | 7 | 0 | 0 | -1 | 3 | 16 |
| 151FA05322 | 9 | 7 | 0 | 5 | 6 | 18 | 20 | 6 |
| 151FA05360 | - | 1 | 3 | -1 | 4 | 4 | 3 | 7 |
| 151FA05362 | - | 4 | 7 | 1 | 1 | 11 | 13 | 13 |
| 151FA05363 | - | 5 | 5 | -1 | 3 | -1 | 15 | 10 |
| 161LA05013 | 5 | 7 | 9 | 9 | 9 | 22 | 28 | 20 |
| 161LA05014 | 0 | 1 | 5 | -1 | 1 | 16 | 19 | 9 |
| 161LA05015 | 0 | 1 | 5 | 1 | 3 | 16 | 18 | 10 |
| 161LA05016 | - | 2 | 8 | 0 | 2 | 11 | 13 | 18 |
| 161LA05028 | -1 | 7 | 9 | 0 | 6 | 13 | 18 | 18 |

2. The process of computing assessment tool ‘e’ of a course C212 (EC219 -Electronic Devices and Circuits, 03 Semester ECE) is shown in below table.

CO assessment based on semester end results (Theory)

| | |
|---------------------------------|-------|
| SemesterEnd Examination | |
| Target | 40% |
| Max Marks | 60 |
| Minimum Score Set as Basis | 24 |
| No. of Students Attended | 331 |
| No. of Students Attained | 281 |
| Percentage of Students Attained | 85% |
| Attainment Level | 3 |
| COs Attained | |
| CO 1 | 3 |
| CO 2 | 3 |
| CO 3 | 3 |
| CO 4 | 3 |
| Result Analysis | |
| Register Number | Marks |
| 141FA05005 | 33 |
| 151FA05007 | 56 |

| | |
|------------|----|
| 151FA05009 | 52 |
| 151FA05011 | 53 |
| 151FA05015 | 46 |
| 151FA05030 | 45 |
| 151FA05046 | 50 |
| 151FA05050 | 46 |
| 151FA05052 | 57 |
| 151FA05056 | 52 |
| 151FA05058 | 46 |
| 151FA05061 | 40 |
| • | |
| • | |
| • | |
| • | |
| 151FA05297 | 10 |
| 151FA05309 | 42 |
| 151FA05315 | 4 |
| 151FA05322 | 28 |
| 151FA05360 | 7 |
| 151FA05362 | 15 |
| 151FA05363 | 13 |
| 161LA05013 | 51 |
| 161LA05014 | 24 |
| 161LA05015 | 24 |
| 161LA05016 | 27 |
| 161LA05028 | 33 |

3. The process of computing assessment tool ‘b’ of a course C217(EC207 -Electronic Devices and Circuits Lab, 03 Semester ECE) is shown in below table.

CO assessment based on internal results (Lab)

| | |
|---------------------------------|-------|
| Internal Examination | |
| Target | 60% |
| Max Marks | 50 |
| Minimum Score Set as Basis | 30 |
| No. of Students Attended | 334 |
| No. of Students Attained | 330 |
| Percentage of Students Attained | 99% |
| Attainment Level | 3 |
| COs Attained | |
| CO 1 | 3 |
| CO 2 | 3 |
| Result Analysis | |
| Register Number | Marks |

| | |
|--|----|
| 141FA05005 | 40 |
| 151FA05007 | 50 |
| 151FA05009 | 44 |
| 151FA05011 | 45 |
| 151FA05015 | 49 |
| 151FA05030 | 46 |
| 151FA05046 | 49 |
| 151FA05050 | 50 |
| 151FA05052 | 49 |
| 151FA05056 | 47 |
| 151FA05058 | 47 |
| 151FA05061 | 49 |
| <ul style="list-style-type: none"> • • • • | |
| 151FA05297 | 35 |
| 151FA05309 | 46 |
| 151FA05315 | 31 |
| 151FA05322 | 42 |
| 151FA05360 | 31 |
| 151FA05362 | 40 |
| 151FA05363 | 35 |
| 161LA05013 | 48 |
| 161LA05014 | 41 |
| 161LA05015 | 34 |
| 161LA05016 | 37 |
| 161LA05028 | 43 |

4. The process of computing assessment tool ‘f’ of a C217 (EC207 -Electronic Devices and Circuits Lab, 03 Semester ECE) is shown in below table.

CO assessment based on semesterend results (Lab)

| | |
|---------------------------------|-----|
| Semester End Examination | |
| Target | 40% |
| Max Marks | 50 |
| Minimum Score Set as Basis | 20 |
| No. of Students Attended | 331 |
| No. of Students Attained | 328 |
| Percentage of Students Attained | 99% |
| Attainment Level | 3 |

| COs Attained | |
|--|-------|
| CO 1 | 3 |
| CO 2 | 3 |
| Result Analysis | |
| Register Number | Marks |
| 141FA05005 | 40 |
| 151FA05007 | 44 |
| 151FA05009 | 44 |
| 151FA05011 | 35 |
| 151FA05015 | 45 |
| 151FA05030 | 45 |
| 151FA05046 | 43 |
| 151FA05050 | 43 |
| 151FA05052 | 46 |
| 151FA05056 | 33 |
| 151FA05058 | 43 |
| 151FA05061 | 39 |
| <ul style="list-style-type: none"> • • • • • • | |
| 151FA05297 | 39 |
| 151FA05309 | 41 |
| 151FA05315 | 16 |
| 151FA05322 | 38 |
| 151FA05360 | 19 |
| 151FA05362 | 29 |
| 151FA05363 | 37 |
| 161LA05013 | 45 |
| 161LA05014 | 39 |
| 161LA05015 | 26 |
| 161LA05016 | 44 |
| 161LA05028 | 40 |

5. The process of computing assessment tool 'c' of a course C220 (SR002 - Seminar, 03 Semester ECE) is shown in below table.

CO assessment based on semester internal results (Seminar)

| | |
|---------------------------------|-------|
| Internal Examination | |
| Target | 60% |
| Max Marks | 100 |
| Minimum Score Set as Basis | 60 |
| No. of Students Attended | 334 |
| No. of Students Attained | 331 |
| Percentage of Students Attained | 99% |
| Attainment Level | 3 |
| COs Attained | |
| CO 1 | 3 |
| CO 2 | 3 |
| CO 3 | 3 |
| Result Analysis | |
| Register Number | Marks |
| 141FA05005 | 69 |
| 151FA05007 | 90 |
| 151FA05009 | 85 |
| 151FA05011 | 78 |
| 151FA05015 | 79 |
| 151FA05030 | 90 |
| 151FA05046 | 76 |
| 151FA05050 | 88 |
| 151FA05052 | 87 |
| 151FA05056 | 73 |
| 151FA05058 | 86 |
| 151FA05061 | 92 |
| . | |
| . | |
| . | |
| . | |
| . | |
| 151FA05297 | 84 |
| 151FA05309 | 81 |
| 151FA05315 | 53 |
| 151FA05322 | 79 |
| 151FA05360 | 72 |
| 151FA05362 | 82 |
| 151FA05363 | 86 |

| | |
|------------|----|
| 161LA05013 | 90 |
| 161LA05014 | 75 |
| 161LA05015 | 79 |
| 161LA05016 | 84 |
| 161LA05028 | 74 |

6. The process of computing assessment tool ‘d’ of a course C420 (EC426 – Internship, 07 Semester ECE) is shown in below table.

CO assessment based on internal results (Internship)

| Internal Examination | Mid-term Viva-Voce 1 | Mid-term Viva-Voce 2 |
|---------------------------------|----------------------|----------------------|
| Target | 60% | 60% |
| Max Marks | 25 | 25 |
| Minimum Score Set as Basis | 15 | 15 |
| No. of Students Attended | 174 | 174 |
| No. of Students Attained | 174 | 174 |
| Percentage of Students Attained | 100% | 100% |
| Attainment Level | 3 | 3 |
| COs Attained | | |
| CO 1 | 3 | 3 |
| CO 2 | 3 | 3 |
| Result Analysis | | |
| Register Number | Marks | Marks |
| 151FA05009 | 24 | 23 |
| 151FA05017 | 24 | 22 |
| 151FA05028 | 24 | 23 |
| 151FA05030 | 24 | 23 |
| 151FA05305 | 24 | 24 |
| 151FA05041 | 23 | 21 |
| 151FA05130 | 23 | 21 |
| 151FA05007 | 24 | 25 |
| 151FA05026 | 24 | 25 |
| • | | |
| • | | |
| • | | |
| • | | |
| • | | |
| 151FA05011 | 23 | 21 |
| 151FA05103 | 23 | 20 |
| 151FA05358 | 23 | 21 |
| 151FA05136 | 25 | 24 |
| 151FA05210 | 25 | 24 |
| 151FA05063 | 24 | 25 |

| | | |
|------------|----|----|
| 151FA05072 | 24 | 25 |
| 151FA05074 | 24 | 25 |
| 151FA05098 | 24 | 25 |
| 151FA05020 | 25 | 24 |
| 151FA05039 | 25 | 24 |
| 151FA05047 | 25 | 24 |
| 151FA05119 | 25 | 24 |

7. The process of computing assessment tool 'g' of a course C420 (EC426 – Internship, 07 Semester ECE) is shown in below table.

CO assessment based on semesterend results (Internship)

| | |
|---------------------------------|-------|
| Semester End Examination | |
| Target | 40% |
| Max Marks | 50 |
| Minimum Score Set as Basis | 20 |
| No. of Students Attended | 174 |
| No. of Students Attained | 174 |
| Percentage of Students Attained | 100% |
| Attainment Level | 3 |
| COs Attained | |
| CO 1 | 3 |
| CO 2 | 3 |
| Result Analysis | |
| Register Number | Marks |
| 151FA05009 | 43 |
| 151FA05017 | 46 |
| 151FA05028 | 45 |
| 151FA05030 | 44 |
| 151FA05305 | 47 |
| 151FA05041 | 46 |
| 151FA05130 | 48 |
| • | |
| • | |
| • | |
| • | |
| • | |
| 151FA05063 | 47 |
| 151FA05072 | 48 |
| 151FA05074 | 48 |
| 151FA05098 | 47 |
| 151FA05020 | 49 |
| 151FA05039 | 48 |
| 151FA05047 | 49 |
| 151FA05119 | 49 |

The above procedure of computing overall CO attainment is to be repeated for each course from first year to final year in an academic year in order to enable computation of PO and PSO attainment levels.

3.2.2. Record the attainment of Course Outcomes of all courses with respect to set attainment levels

Attainment of COs is measured from the performance of students in cumulative internal examinations and from the course marks of the students in semester end examination.

The overall pass percentage of the students is considered for CO attainment of that particular course.

The attainment is measured in terms of percentage of students achieving the set target marks.

The attainment target of CO is based on **60% of cumulative internal examinations** as moderate level and **40% of semester end examination** as substantial level.

Hence the target value for the CO attainment is 2.4

Attainment Status of Course Outcomes: (2015-2019 Batch)

| Course | Semester | Course Name | Overall |
|---------------|-----------------|--|----------------|
| C111 | 1 | EE111 - Fundamentals of Electrical Engineering | 2.94 |
| C112 | 1 | HS111 - Engineering Mathematics - 1 | 2.90 |
| C113 | 1 | HS117 - Engineering Chemistry | 2.25 |
| C114 | 1 | HS118 - Environmental studies | 1.68 |
| C115 | 1 | HS119 - Professional Ethics, Values and Human Rights | 2.28 |
| C116 | 1 | HS122 - Engineering Materials | 1.98 |
| C117 | 1 | EE113 - Fundamentals of Electrical Engineering Lab | 3.00 |
| C118 | 1 | ME103 - Engineering Graphics lab | 3.00 |
| C119 | 1 | HS121 - Engineering Chemistry lab | 3.00 |
| C121 | 2 | CS101 - Problem Solving & Computer Programming | 2.68 |
| C122 | 2 | CS105 - Network Security | 2.59 |
| C123 | 2 | HS113 - Engineering Physics | 2.58 |
| C124 | 2 | HS114 - Technical English Communication | 2.64 |
| C125 | 2 | HS115 - Engineering Mathematics - II | 2.68 |

| | | | |
|-------|---|---|------|
| C126 | 2 | ME101 - Engineering Mechanics | 2.10 |
| C127 | 2 | CS107 - Computer Programming Lab | 2.17 |
| C128 | 2 | HS120 - Engineering Physics lab | 3.00 |
| C129 | 2 | ME105 - Workshop Practical Lab | 3.00 |
| C211 | 3 | EC217 - Network Theory | 2.64 |
| C212 | 3 | EC219 - Electronic Devices and Circuits | 2.67 |
| C213 | 3 | EC221 - Signals and Systems | 2.28 |
| C214 | 3 | HS215 - Complex Variables and Special Functions | 2.61 |
| C215 | 3 | CS231 - Data Structures using C++ | 2.92 |
| C216 | 3 | EC209 - Signals and Systems Lab | 3.00 |
| C217 | 3 | EC207 - Electronic Devices and Circuits Lab | 3.00 |
| C218A | 3 | CS223 - Object Oriented Programming through Java | 3.00 |
| C218B | 3 | HS219 - Indian History and Culture | 2.90 |
| C218C | 3 | MS203 - Principles of Management and Organizational behaviour | 2.93 |
| C219 | 3 | HS217 - Soft Skills Lab | 3.00 |
| C220 | 3 | SR002 - Seminar | 3.00 |
| C221 | 4 | EC224 - Probability Theory and Stochastic Process | 1.79 |
| C222 | 4 | EC226 - Electronic Circuit Analysis | 2.03 |
| C223 | 4 | EC228 - Digital Electronics | 2.23 |
| C224 | 4 | EC230 - Analog Communications | 2.49 |
| C225 | 4 | EC232 - Electro Magnetic Field Theory | 1.81 |
| C226 | 4 | EC234 - Electronic Circuit Analysis Lab | 3.00 |
| C227 | 4 | EC236 - Analog Communications Lab | 3.00 |
| C228A | 4 | CS315 - Operating Systems | 2.37 |

| | | | |
|-------|---|---|------|
| C228B | 4 | MS212 - Business Environment and Ethics | 3.00 |
| C228C | 4 | HS224 - Polity and Governance of India | 2.40 |
| C229 | 4 | HS304 - Professional Communication Lab | 3.00 |
| C230 | 4 | SR003 - Seminar | 3.00 |
| C311 | 5 | EC317 - Linear ICs and Applications | 2.87 |
| C312 | 5 | EC319 - Microprocessor and Microcontrollers | 2.80 |
| C313 | 5 | EC321 - Digital Communications | 2.75 |
| C314 | 5 | EC331 - Digital Communications Lab | 3.00 |
| C315 | 5 | EC323 - Transmission Lines and Waveguides | 2.45 |
| C316 | 5 | EC327 - IC Application Lab | 3.00 |
| C317 | 5 | EC329 - Microprocessors and Interfacing Lab | 3.00 |
| C318 | 5 | EC325 - Digital IC Applications | 2.64 |
| C319A | 5 | CS222 - Database Systems | 2.14 |
| C319B | 5 | HS307 - Economic and Social Development of India | 3.00 |
| C319C | 5 | MS303 - Marketing and HR Management | 2.74 |
| C320 | 5 | SR004 - Seminar | 3.00 |
| C321 | 6 | EC320 - VLSI Design | 2.74 |
| C322 | 6 | EC322 - Antennas and Wave Propagation | 2.74 |
| C323 | 6 | EC324 - Computer Architecture and Organization | 2.70 |
| C324 | 6 | EE319 - Linear Control Systems | 2.65 |
| C325 | 6 | CS344 - Data Structure using C++ Lab | 3.00 |
| C326 | 6 | EC332 - VLSI Design Lab | 3.00 |
| C327A | 6 | EC326 - Optical Communication | 2.62 |
| C327B | 6 | EC328 - Embedded Systems | 2.60 |
| C327C | 6 | IT311 - Unix and Shell Programming | 2.74 |
| C328A | 6 | CS225 - Software Engineering | 3.00 |
| C328B | 6 | HS403 - Geography and Environmental Concerns of India | 2.63 |

| | | | |
|-------|-----|---|------|
| C328C | 6 | MS312 - Entrepreneurship and Project Management | 3.00 |
| C329 | 6 | EC334 - Mini Project | 3.00 |
| C330 | 6 | SR005 - Seminar | 3.00 |
| C411 | 7/8 | EC431 - Digital Signal Processing | 2.65 |
| C412 | 7/8 | EC433 - RF and Microwave Engineering | 2.70 |
| C413 | 7/8 | EC435 - Electronic Measurements and Instrumentation | 2.67 |
| C414 | 7/8 | MS310 - Managerial Economics | 2.44 |
| C415 | 7/8 | EC449 - Digital Signal Processing Lab | 3.00 |
| C416 | 7/8 | EC451 - Microwave Engineering Lab | 3.00 |
| C417 | 7/8 | EC453 - Instrumentation Lab | 3.00 |
| C418A | 7/8 | EC437 - Data Communications and Computer Networks | 2.66 |
| C418B | 7 | EC443 - Digital design through Verilog | 2.43 |
| C418C | 7/8 | EC445 - Cellular and Mobile Communications | 2.73 |
| C428A | 8 | EC463 - Internet of things | 2.87 |
| C428B | 8 | EC414 - Wireless sensors network | 2.73 |
| C428C | 8 | EC420 - Radar systems | 2.93 |
| C419A | 7/8 | HS403 - Geography and Environmental Concerns of India | 2.79 |
| C419B | 7/8 | MS409 - Production and Operations Management | 2.74 |
| C419C | 7/8 | CS435 - Software Testing Methodologies | 2.67 |
| C420 | 7/8 | EC426 - Internship | 3.00 |
| C421 | 8 | EC424 - Project | 3.00 |

COURSE OUTCOME ATTAINMENT (2015-2019 Batch)

| Course | Semester | Course Name | CO 1 | CO 2 | CO 3 | CO 4 | Overall |
|--------|----------|--|------|------|------|------|---------|
| C111 | 1 | EE111 - Fundamentals of Electrical Engineering | 2.87 | 2.90 | 3.00 | 3.00 | 2.94 |
| C112 | 1 | HS111 - Engineering Mathematics - 1 | 2.73 | 2.87 | 3.00 | 3.00 | 2.90 |
| C113 | 1 | HS117 - Engineering Chemistry | 2.13 | 2.27 | 2.20 | 2.40 | 2.25 |
| C114 | 1 | HS118 - Environmental studies | 1.67 | 1.53 | 1.70 | 1.80 | 1.68 |
| C115 | 1 | HS119 - Professional Ethics, Values and Human Rights | 2.13 | 2.30 | 2.30 | 2.40 | 2.28 |
| C116 | 1 | HS122 - Engineering Materials | 1.60 | 1.90 | 2.00 | 2.40 | 1.98 |
| C117 | 1 | EE113 - Fundamentals of Electrical Engineering Lab | 3.00 | 3.00 | - | - | 3.00 |
| C118 | 1 | ME103 - Engineering Graphics lab | 3.00 | 3.00 | - | - | 3.00 |
| C119 | 1 | HS121 - Engineering Chemistry lab | 3.00 | 3.00 | - | - | 3.00 |
| | | | | | | | |
| C121 | 2 | CS101 - Problem Solving & Computer Programming | 2.60 | 3.00 | 2.57 | 2.55 | 2.68 |
| C122 | 2 | CS105 - Network Security | 2.51 | 2.78 | 2.73 | 2.33 | 2.59 |
| C123 | 2 | HS113 - Engineering Physics | 2.51 | 2.60 | 2.63 | 2.60 | 2.58 |
| C124 | 2 | HS114 - Technical English Communication | 2.42 | 2.83 | 2.53 | 2.80 | 2.64 |
| C125 | 2 | HS115 - Engineering Mathematics - II | 2.51 | 2.73 | 2.80 | 2.70 | 2.68 |
| C126 | 2 | ME101 - Engineering Mechanics | 2.13 | 2.00 | 2.06 | 2.22 | 2.10 |
| C127 | 2 | CS107 - Computer Programming Lab | 1.80 | 2.28 | 2.20 | 2.40 | 2.17 |
| C128 | 2 | HS120 - Engineering Physics lab | 3.00 | 3.00 | - | - | 3.00 |
| C129 | 2 | ME105 - Workshop Practical Lab | 3.00 | 3.00 | - | - | 3.00 |

| | | | | | | | |
|-------|---|---|------|------|------|------|------|
| C211 | 3 | EC217 - Network Theory | 2.57 | 2.92 | 2.56 | 2.52 | 2.64 |
| C212 | 3 | EC219 - Electronic Devices and Circuits | 2.71 | 2.68 | 2.52 | 2.76 | 2.67 |
| C213 | 3 | EC221 - Signals and Systems | 2.01 | 2.26 | 2.52 | 2.32 | 2.28 |
| C214 | 3 | HS215 - Complex Variables and Special Functions | 2.68 | 2.24 | 2.52 | 3.00 | 2.61 |
| C215 | 3 | CS231 - Data Structures using C++ | 2.95 | 3.00 | 2.79 | 2.96 | 2.92 |
| C216 | 3 | EC209 - Signals and Systems Lab | 3.00 | 3.00 | - | - | 3.00 |
| C217 | 3 | EC207 - Electronic Devices and Circuits Lab | 3.00 | 3.00 | - | - | 3.00 |
| C218A | 3 | CS223 - Object Oriented Programming through Java | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| C218B | 3 | HS219 - Indian History and Culture | 2.60 | 3.00 | 3.00 | 3.00 | 2.90 |
| C218C | 3 | MS203 - Principles of Management and Organizational behaviour | 3.00 | 3.00 | 3.00 | 2.73 | 2.93 |
| C219 | 3 | HS217 - Soft Skills Lab | 3.00 | 3.00 | - | - | 3.00 |
| C220 | 3 | SR002 - Seminar | 3.00 | 3.00 | 3.00 | - | 3.00 |
| | | | | | | | |
| C221 | 4 | EC224 - Probability Theory and Stochastic Process | 1.68 | 1.78 | 1.80 | 1.92 | 1.79 |
| C222 | 4 | EC226 - Electronic Circuit Analysis | 2.33 | 1.80 | 2.20 | 1.80 | 2.03 |
| C223 | 4 | EC228 - Digital Electronics | 2.14 | 2.44 | 2.28 | 2.04 | 2.23 |
| C224 | 4 | EC230 - Analog Communications | 2.60 | 2.52 | 2.60 | 2.24 | 2.49 |
| C225 | 4 | EC232 - Electro Magnetic Field Theory | 1.73 | 2.04 | 1.88 | 1.75 | 1.81 |
| C226 | 4 | EC234 - Electronic Circuit Analysis Lab | 3.00 | 3.00 | - | - | 3.00 |
| C227 | 4 | EC236 - Analog Communications Lab | 3.00 | 3.00 | - | - | 3.00 |
| C228A | 4 | CS315 - Operating Systems | 2.00 | 2.47 | 2.60 | 2.40 | 2.37 |
| C228B | 4 | MS212 - Business Environment and Ethics | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| C228C | 4 | HS224 - Polity and Governance of India | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 |
| C229 | 4 | HS304 - Professional Communication Lab | 1.78 | 3.00 | - | - | 3.00 |
| C230 | 4 | SR003 - Seminar | 3.00 | 3.00 | 3.00 | - | 3.00 |

| | | | | | | | |
|-------|---|---|-------|------|------|------|-------|
| C311 | 5 | EC317 - Linear ICs and Applications | 2.95 | 2.89 | 2.87 | 2.79 | 2.87 |
| C312 | 5 | EC319 - Microprocessor and Microcontrollers | 2.78 | 2.76 | 2.88 | 2.76 | 2.80 |
| C313 | 5 | EC321 - Digital Communications | 3.00 | 2.92 | 2.56 | 2.52 | 2.75 |
| C314 | 5 | EC331 - Digital Communications Lab | 3.00 | 3.00 | - | - | 3.00 |
| C315 | 5 | EC323 - Transmission Lines and Waveguides | 2.44 | 1.91 | 2.44 | 3.00 | 2.45 |
| C316 | 5 | EC327 - IC Application Lab | 3.00 | 3.00 | - | - | 3.00 |
| C317 | 5 | EC329 - Microprocessors and Interfacing Lab | 3.00 | 3.00 | - | - | 3.00 |
| C318 | 5 | EC325 - Digital IC Applications | 2.52 | 2.65 | 2.52 | 2.87 | 2.64 |
| C319A | 5 | CS222 - Database Systems | 2.13 | 2.19 | 2.13 | 2.40 | 2.14 |
| C319B | 5 | HS307 - Economic and Social Development of India | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| C319C | 5 | MS303 - Marketing and HR Management | 2.60 | 2.76 | 3.00 | 2.60 | 2.74 |
| C320 | 5 | SR004 - Seminar | 3.00 | 3.00 | 3.00 | - | 3.00 |
| C321 | 6 | EC320 - VLSI Design | 2.68 | 2.81 | 2.8 | 2.68 | 2.74 |
| C322 | 6 | EC322 - Antennas and Wave Propagation | 2.8 | 2.76 | 2.51 | 2.88 | 2.74 |
| C323 | 6 | EC324 - Computer Architecture and Organization | 2.8 | 2.86 | 2.55 | 2.57 | 2.7 |
| C324 | 6 | EE319 - Linear Control Systems | 2.648 | 2.6 | 2.52 | 2.84 | 2.652 |
| C325 | 6 | CS344 - Data Structure using C++ Lab | 3.00 | 3.00 | - | - | 3.00 |
| C326 | 6 | EC332 - VLSI Design Lab | 3.00 | 3.00 | - | - | 3.00 |
| C327A | 6 | EC326 - Optical Communication | 2.20 | 2.73 | 2.80 | 2.73 | 2.62 |
| C327B | 6 | EC328 - Embedded Systems | 2.60 | 2.60 | 2.60 | 2.60 | 2.60 |
| C327C | 6 | IT311 - Unix and Shell Programming | 2.60 | 2.73 | 2.73 | 2.90 | 2.74 |
| C328A | 6 | CS225 - Software Engineering | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| C328B | 6 | HS403 - Geography and Environmental Concerns of India | 3.00 | 2.70 | 2.40 | 2.40 | 2.63 |
| C328C | 6 | MS312 - Entrepreneurship and Project Management | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| C329 | 6 | EC334 - Mini Project | 3.00 | 3.00 | - | - | 3.00 |
| C330 | 6 | SR005 - Seminar | 3.00 | 3.00 | 3.00 | - | 3.00 |

| | | | | | | | |
|-------|-----|---|------|------|------|------|------|
| C411 | 7/8 | EC431 - Digital Signal Processing | 2.38 | 2.47 | 2.93 | 2.70 | 2.65 |
| C412 | 7/8 | EC433 - RF and Microwave Engineering | 2.68 | 2.78 | 2.82 | 2.50 | 2.70 |
| C413 | 7/8 | EC435 - Electronic Measurements and Instrumentation | 2.50 | 2.54 | 2.74 | 2.90 | 2.67 |
| C414 | 7/8 | MS310 - Managerial Economics | 2.38 | 2.49 | 2.48 | 2.60 | 2.44 |
| C415 | 7/8 | EC449 - Digital Signal Processing Lab | 3.00 | 3.00 | - | - | 3.00 |
| C416 | 7/8 | EC451 - Microwave Engineering Lab | 3.00 | 3.00 | - | - | 3.00 |
| C417 | 7/8 | EC453 - Instrumentation Lab | 3.00 | 3.00 | - | - | 3.00 |
| C418A | 7/8 | EC437 - Data Communications and Computer Networks | 2.70 | 2.65 | 2.79 | 2.50 | 2.66 |
| C418B | 7 | EC443 - Digital design through Verilog | 2.68 | 2.64 | 2.60 | 1.80 | 2.43 |
| C418C | 7/8 | EC445 - Cellular and Mobile Communications | 2.58 | 2.69 | 2.80 | 2.85 | 2.73 |
| C428A | 8 | EC463 - Internet of things | 3.00 | 2.85 | 3.00 | 2.60 | 2.87 |
| C428B | 8 | EC414 - Wireless sensors network | 2.60 | 2.60 | 2.87 | 2.87 | 2.73 |
| C428C | 8 | EC420 - Radar systems | 3.00 | 2.80 | 2.90 | 3.00 | 2.93 |
| C419A | 7/8 | HS403 - Geography and Environmental Concerns of India | 2.67 | 2.90 | 2.80 | 2.80 | 2.79 |
| C419B | 7/8 | MS409 - Production and Operations Management | 2.87 | 2.82 | 2.67 | 2.60 | 2.74 |
| C419C | 7/8 | CS435 - Software Testing Methodologies | 2.60 | 2.78 | 2.80 | 2.50 | 2.67 |
| C420 | 7/8 | EC426 - Internship | 3.00 | 3.00 | - | - | 3.00 |
| C421 | 8 | EC424 - Project | 3.00 | 3.00 | - | - | 3.00 |

3.3. Attainment of Program Outcomes and Program Specific Outcomes

3.3.1. Describe assessment tools and processes used for measuring the attainment of each Program Outcome and Program Specific Outcomes

PROGRAM OUTCOME ASSESSMENT TOOLS:

- Assessment tools for POs and PSOs are categorized into two namely i) direct assessment method and ii) indirect assessment method.
- Direct assessment method is for 80% and indirect assessment method is for 20%.

Step by step process of assessment of POs

Step 1: The program coordinator analyses each outcome into elements (different abilities specified in the outcome) and a set of attributes are defined for each element (actions that explicitly demonstrate mastery of the abilities specified), in addition, generate well designed surveys to assess the outcome.

Step 2: For each program outcome define performance indicators (Assessment criteria) and their target levels.

Step 3: Identify/select courses that address the outcome (each course contributes to at least one of the program outcome). Hence, each program outcome is assessed in several courses to ensure that students acquire an appropriate level in terms of knowledge/skills of an outcome.

Step 4: The program coordinators collect the qualitative and quantitative data and were used for outcome assessment in a continual process.

Step 5: The program monitoring and assessment committee analyse the collected data. If the assessed data meets the performance targets which are specified in step 2, then the program outcome is attained.

i) Direct assessment method

Direct method helps to increase the student knowledge and skills based on the cumulative internal examinations and semester end examination.

Direct assessment of POs and PSOs is calculated using the following procedure.

- CO-PO mapping table is considered for attainment.
- CO assessment is done by considering cumulative internal examinations and semester end examination marks. It is used to identify the level of COs attainment.
- The attained COs for a course is multiplied with the values of CO-PO mapping table and divided by mapped cells multiplied by the substantial correlation value.
- The obtained PO is compared with pre-defined PO target.

Example:

PO attainment for the course C212 (EC219 -Electronic Devices and Circuits, 03 Semester ECE) is shown in below table

| CO-PO Mapping Table | | | | | | | | | | | | | | | |
|----------------------|-------------|-------------|-------------|-------------|-----|-----|-----|-----|-----|------|------|-------------|------|------|-------------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO 1 | 3 | 2 | | | | | | | | | | 2 | | | 2 |
| CO 2 | 2 | 3 | 2 | 3 | | | | | | | | | | | 2 |
| CO 3 | 2 | 2 | 3 | | | | | | | | | 2 | | | 2 |
| CO 4 | 3 | 3 | 2 | | | | | | | | | 1 | | | 2 |
| CO Attainment | CO 1 | CO 2 | CO 3 | CO 4 | | | | | | | | | | | |
| Level | 2.71 | 2.68 | 2.52 | 2.76 | | | | | | | | | | | |
| POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| PO Average | 2.50 | 2.50 | 2.33 | 3.00 | | | | | | | | 1.67 | | | 2.00 |
| PO Attainment | 2.23 | 2.23 | 2.05 | 2.68 | | | | | | | | 1.47 | | | 1.78 |

ii) Indirect assessment method

Indirect Assessment involves the qualitative method of obtaining the reflections of the stakeholders on the achievement of the program outcomes, through feedback mechanism. These methods provide clues about what could be assessed directly easy to administer particularly useful for ascertaining values and beliefs.

The stakeholders include :

- Students
- Alumni
- Current faculty
- Employers offering training(interns)
- Parents
- Experts

The methods include

- Exit feedback
- Final year student feedback
- Oral interviews
- Alumni feedback
- Feedback from employers offering training
- Direct feedback of the students on the POs and PSOs.
- Experts feedback

Indirect assessments of student learning ascertains the perceived extent or value of learning experiences. They assess opinions or thoughts about student knowledge or skills. Indirect measures can provide information about student perception of their learning and how this learning is valued by different constituencies. An indirect assessment is useful in that it can be used to measure certain implicit qualities of student learning, such as values, perceptions, and attitudes, from a variety of perspectives.

Procedure for calculating attainment from indirect assessment:

- The questions of each of the feedback forms from different stakeholders are mapped to the POs.
- The feedback received for each question is converted into the satisfactifon level as follows:

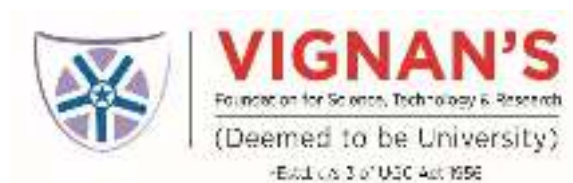
- If the answer is either Excellent/good/satisfactory/not upto the mark, they are rated as 4/3/2/1 respectively.
- Average of this value is converted to the scale of 0 to 1.
- Similarly, if the answer is Yes/No the average is calculated as (number of Yes/total numbers of Yes or No).
- If the average is 0.75, then the satisfaction level is treated as 75%, if the average is 0.89 then the satisfaction level is treated as 89 %.
- Based on the satisfaction level attainment is obtained as follows

| Satisfaction level | Attainment |
|---------------------|------------|
| Above 80% | 3 |
| Between 60% and 80% | 2 |
| Between 50% and 60% | 1 |
| Below 50% | 0 |

- The attainment level is filled against the mapped PO corresponding to the feedback question.
- Average of the attainments of all the questions for a PO is calculated and tabulated for all the forms and final average is also calculated.
- On the other side, direct feedback on the POs and PSOs is also collected from graduates on the scale of 0 to 3.
- Then, average is calculated from direct feedback, which is considered as the attainment from the direct feedback.
- To get final attainment from indirect assessment for the POs, the attainments obtained from the feedback forms and the direct feedback on POs and PSOs are added.
- 20% of the final attainment from the indirect assessment is then calculated and added to the 80% of the direct assessment to get overall attainment of the POs and PSOs.

Feedback forms:

Alumni Feedback Form:



VFSTR/ACADEMICS/7/4/2018

Office of Dean, Academics

To Alumni

Date _____

Dear Students,

It gives us immense pleasure to have you as part of our Vignan's family. To help your juniors at University chose the right path to excel through academics in various aspects such as jobs, research, entrepreneurship, we request you to provide feedback on the curricular aspects. We request you to spare 5-10 minutes for completion of this questionnaire and we greatly appreciate your effort for a right cause.

1. Courses/subjects you have studied at VFSTR gave you sufficient fundamental knowledge?

A. YES B. NO

If 'No', what else is required

2. Courses/subjects of the program you had studied are in tune with industry needs?
What is your opinion?

B. YES B. NO

If no, what is required

3. Based on the situation prevailing in existing job market, list the courses/subjects that students at VFSTR should study or study in-depth to suit industry requirements.

4. List the courses/subjects that are in great demand and you should have studied in-depth

5. List the courses/subjects that you feel are not necessary to study in-depth but you feel that you had put lot of effort

6. What is your feeling about your competency in comparison with your peers from other Universities

1. Highly competent 2. Average 3. Low
4. Cannot compare

7. Are you aware of the program outcomes

A. Yes B. No

8. Other than courses that you had studied during your program, which interdisciplinary courses you felt were important to suit the existing job market requirements in Indian/global scenario, to become an entrepreneur or to suit research needs

9. Your over all opinion on the curriculum

Name of the Alumni: _____

Branch and Department: _____

Roll Number at VFSTR: _____

Contact No: _____

E-mail ID: _____

Signature: _____

Feedback Form from Employers offering Training to VFSTR students (Interns):



VFSTR/ACADEMICS/4/4/2018

Office of Dean, Academics

To Employers offering Training to VFSTR students (Interns)

Date: _____

Dear Sir/Madam,

We sincerely thank you for providing our interns an opportunity to pursue internship in your institute/company. You must have got an opportunity to evaluate their practical and theoretical knowledge on various aspects. In order for us to effectively understand the positive and negative attributes of our curriculum and its applicability, we request you to provide feedback on the curricular aspects. We request you to spare 5-10 minutes for completion of the questionnaire and we greatly appreciate your effort for a right cause.

1. How is the basic technical knowledge of interns
A. Excellent B. Good C. Satisfactory D. Not upto the mark
2. How is the overall technical knowledge of student who is pursued internship in your organization
A. Excellent B. Good C. Satisfactory D. unsatisfactory
3. How good do you find the ability of intern to amalgamate practical and theoretical knowledge to solve simple technical problems
A. Excellent B. Good C. Satisfactory D. Not upto the mark
4. How good do you find the ability of intern to amalgamate practical and theoretical knowledge to solve complex technical problems
A. Excellent B. Good C. Satisfactory D. Not upto the mark
5. What is your feeling about the competency of our student as an intern in comparison with interns from other Universities/Institutes
A. Highly competent B. On par with students from IITs/NITs
C. On par with students from other reputed Universities D. Not so competent

6. Have you ever had an opportunity to know the courses/subjects, our intern has studied during his B.Tech/M.Tech program

A. Yes B. No

7. Do you feel that the Courses/Subjects of our program are in tune with industry needs

A. Yes B. No

If 'No' , please list the courses that should be studied to make them competent

8. Do you feel that the Courses/Subjects of our program are well molded to make our students entrepreneurs

B. Yes B. No

9. Your comments about intern curricular aspects & suggestions for further improvement of the curriculum

We thank you for providing feedback and we value your suggestions. In order for us to get back with a positive note on your suggestions, please fill in the details given below.

Name of the intern & Branch at VFSTR: _____

Name of the External supervisor (Company/Industry): _____

External Supervisors Work place _____

External Supervisors Designation _____

Contact Number: _____

E-mail id: _____

Feedback by faculty:



VFSTR/ACADEMICS/8/4/2018

Office of Dean, Academics

To Faculty

Dated-

24/4/2018 Dear Faculty member,

We sincerely thank you for nurturing our students in providing quality education for their bright future. You must have got an opportunity to evaluate our student's analytical ability in various aspects and also assess their practical and theoretical knowledge. In order for us to effectively understand the positive and negative attributes of our curriculum and its applicability, we request you to provide feedback on the curricular aspects. We request you to spare 5-10 minutes for completion of the questionnaire and we greatly appreciate your effort for a right cause.

1. What is opinion on curriculum which encompasses all thrust areas of the program
A.Excellent B. Good C. Satisfactory D. unsatisfactory

2. How good do you find the ability of students to amalgamate practical and theoretical knowledge to solve simple technical problems
A. Excellent B. Good C. Satisfactory D. Not upto the mark

3. What is your assessment on amalgamation of theoretical courses with practical sessions, modular courses, minor projects, etc

A. Excellent B. Good C. Satisfactory D. Not upto the mark

If the answer is either C or D above, please list the reasons

-
4. What is your feeling about the competency of our student in comparison with students from other Universities/Institutes you had interacted
A.Highly competent B. On par with students from IITs/NITs

C. On par with students from other reputed Universities D. No Comments

5. Do you feel that the Courses/Subjects of your program are in tune with industry needs

A. Yes B. No

If 'No', please list the courses that should be studied to make them competent

6. Do you feel that the Courses/Subjects of your program are well moulded to make our students entrepreneurs

A. Yes B. No

7. Do you feel that the Courses/Subjects of your program are suitable for national level competitive exams like GATE, IES, ETC

A. Yes B. No

Your comments about & suggestions for further improvement of the curriculum

We thank you for providing feedback and we value your suggestions. In order for us to get back with a positive note on your suggestions, please fill in the details given below.

Name of the Faculty & Department: _____

Contact Number: _____

E-mail id: _____

Feedback from Final year students:

VIGNAN'S

Foundation for Science, Technology & Research

(Deemed to be University)

-Estd. u/s 3 of IJGC Act 1956

VFSTR/ACADEMICS/3/4/2018

Office of Dean, Academics

To Final year students

Date

Dear Students,

It gives us immense pleasure to have you as part of our Vignan's family. To help your juniors chose the right path to excel through academics in various aspects such as jobs, research, entrepreneurship, we request you to provide feedback on the curricular aspects. As you are at the verge of completing the program and as majority of you have got an opportunity to pursue internship in industries, we request you to spare 5-10 minutes for completion of this questionnaire and we greatly appreciate your effort for a right cause.

1. Courses/subjects you have studied during this program gave you sufficient fundamental knowledge? A. YES B. NO

If 'No', what else is required

2. Courses/subjects of your program are in tune with industry needs? What is your opinion based on your internship experience? B. YES B. NO

If no, what is required

3. Based on the situation prevailing in existing job market, list the courses/subjects that your juniors and sub-juniors need to study or study in-depth to suit industry requirements.

4. Which subjects or courses you felt were tough during your course of study. Do you think extra classes or rigorous revision had helped you

5. List the courses/subjects that are in great demand and you should have studied in-depth

6. List the courses/subjects that you feel are not necessary to study in-depth but you feel that you had put lot of effort

7. What is your feeling about your competency in comparison with interns from other Universities

1. Highly competent

2. Average

3. Low

4. Cannot compare

8. Are you aware of the program outcomes

A. Yes B. No

9. Other than courses that you had studied during your program, which interdisciplinary courses you felt were important to suit the existing job market requirements in Indian/global scenario, to become an entrepreneur or to suit research needs

10. Your over all opinion on the curriculum

Name of the student: _____

Branch and Department: _____

Roll Number: _____

Contact No: _____

E-mail ID: _____

Signature: _____

Feedback from parents:



VFSTR/ACADEMICS/6/4/2018

Office of Dean, Academics

To Parents

Date-

Dear Parents,

We sincerely thank you for choosing our University to place your ward so as to ensure his bright future. You must have got an opportunity to analyze curricular aspects, academic and emotional progression of students and his/her involvement in various curricular aspects. In order for us to effectively understand the positive and negative attributes of our curriculum and its applicability, we request you to provide feedback. We request you to spare 5-10 minutes for completion of the questionnaire and we greatly appreciate your effort for a right cause.

1. Are you satisfied with the theoretical courses and practical sessions offered in our curriculum
A. Highly Satisfactory B. Satisfactory C. Average level of satisfaction D. None
2. What is your overall assessment of technical knowledge acquired by your child who is pursuing his/her program in our University
A. Excellent B. Good C. Satisfactory D. Unsatisfactory
E. No comment
3. How satisfied are you with the over all development (Academic, Emotional, etc) of the child
A. Excellent B. Good C. Satisfactory D. No Comment
4. What is your feeling about the competency of your child as a student in comparison with students from other Universities/Institutes
A. Highly competent B. On par with students from IITs/NITs
C. On par with students from other reputed Universities D. No comment

5. Do you feel that the Courses/Subjects of our program are in tune with industry needs

A.Yes B. No

If 'No' , please list the courses that should be studied to make them competent

6. What is your view on Counselling carried out in our institute A.Excellent B. Good

C. Satisfactory D. No comment

7. Your comments about curricular aspects & suggestions for further improvement of the curriculum

We thank you for providing feedback and we value your suggestions. In order for us to get back with a positive note on your suggestions, please fill in the details given below.

Name of the student: _____

Name of the Parent: _____

Contact Number: _____

E-mail id: _____

Feedback from experts:



VFSTR/ACADEMICS/4/4/2018-Exp

Office of Dean, Academics

Dear Sir/Madam,

Date

It gives us immense pleasure to have you as an expert for evaluating our curriculum. To help our students choose the right path to excel through academics in various aspects such as jobs, research, entrepreneurship, we request you to provide feedback on the curricular aspects. We request you to spare 5-10 minutes for completion of this questionnaire and we greatly appreciate your effort for a right cause.

Name of the Program

1. Your opinion on "Whether Courses/subjects of the program will give sufficient fundamental knowledge to the students".

A. YES B. NO

If 'No', what else is required

2. Courses/subjects of the program are in tune with industry needs?

A. YES B. NO

If no, what is required

3. Based on the situation prevailing in existing job market, list the courses/subjects that our students need to study or study in-depth to suit industry requirements.

4. List the courses/subjects that are in great demand and you feel that our students should have studied/study in-depth

5. Your opinion on program outcomes

6. Other than courses listed in the program, which interdisciplinary courses you felt were important to suit the existing job market requirements in Indian/global scenario, to become an entrepreneur or to suit research needs

7. Your overall opinion on the curriculum

Name of the evaluator: _____ Designation:

Official address:

E-mail ID: _____ Phone number: _____ **Signature:**

Graduates Feedback Form:

Feedback of Graduates on Attainment of the Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) of the UG Programme B.Tech. ECE Graduates are requested to rate the attainment-level of the Program Outcomes (POs) and Program Specific Outcomes of the UG Program B.Tech (ECE) which they have undergone in the Department of Electronics & Communication Engineering, VFSTR Deemed to be University.

Note: Please opt your choice (Excellent - 3, Very Good – 2 , Good – 1, Poor – 0)

***Required**

Name of the Graduate *

Your answer

Regd. No. *

Your answer

Email ID

Your answer

Batch *

Choose

PO 1: Apply knowledge of Mathematics, Science, Electronics and Communications Engineering to solve the real-world problems of core and allied engineering disciplines. (Engineering knowledge) *

3

2

1

0

PO 2: Identify, formulate, survey literature and analyze Electronics and Communications Engineering problems and arrive at suitable conclusions. (Problem analysis) *

3

2

1

0

PO 3: Design / Develop solutions for Electronics and Communications Engineering problems with due consideration for public health & safety, cultural, societal and environmental concerns. (Design/development of solutions) *

3

2

1

0

PO 4: Conduct investigations on complex Computer Science & Engineering problems using various research methods including design of experiments, analysis and interpretation of data and synthesis of information to arrive at valid conclusions. (Conduct investigations of complex problems) *

3 2 1 0

PO 5: Use appropriate techniques, resources, modern engineering and ECE tools to model and simulate complex Electronics and Communications Engineering systems with an understanding of their limitations .(Modern tool usage). *

3 2 1 0

PO 6: Assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to Electronics and Communications Engineering practices. (The engineer and society) *

3 2 1 0

PO 7: Understand the impact of Electronics and Communications Engineering solutions on society & eco-friendly environment and the need for sustainable development.(Environment and sustainability) *

3 2 1 0

PO 8: Follow Professional ethics and commit to responsibilities & norms of the engineering practices. (Ethics) *

3 2 1 0

PO 9: Contribute effectively as an individual, member or leader of intra and inter-disciplinary teams/working environment.(Individual and team work) *

3 2 1 0

PO 10: Communicate effectively both in verbal and written forms with engineers/technocrats in particular and with society at large and give/receive clear instructions. (Communication) *

3 2 1 0

PO 11: Apply the principles of engineering and management as a member or leader to manage projects in multidisciplinary environment. (Project management and finance) *

3 2 1 0

PO 12: Recognize the necessity and pursue independent & life-long learning to keep abreast of technological changes. (Life-long learning). *

3

2

1

0

PSO1: Analyze and design electronic systems for signal processing, communications and other applications. *

3

2

1

0

PSO2: Develop Solutions for various problems using Embedded Systems and Internet of Things *

3

2

1

0

PSO3: Apply domain-specific knowledge to design, analyze, synthesize and validate the VLSI systems. *

3

2

1

0

Exit Feedback form:



STUDENT FEEDBACK

Batch:

Name:

Branch:

Regd. No:

Dear Student,

Hearty Congratulations on completing of your B. Tech. course work. The University requires your feedback on the institute. We request you to give your considered answers to the following questionnaire.

Student's Feedback on: (Please tick)

A. Infrastructure

1. Ambience of the institution for learning : Excellent / Good / Satisfactory / Not satisfactory
2. Comfort of Classroom : Excellent / Good / Satisfactory / Not satisfactory
3. Equipment of Lab : Excellent / Good / Satisfactory / Not satisfactory
4. Access of Library : Excellent / Good / Satisfactory / Not satisfactory
5. Internet Access : Excellent / Good / Satisfactory / Not satisfactory
6. Sports facilities : Excellent / Good / Satisfactory / Not satisfactory
7. Cultural activities : Excellent / Good / Satisfactory / Not satisfactory
8. Recreational facilities : Excellent / Good / Satisfactory / Not satisfactory
9. Canteen facilities : Excellent / Good / Satisfactory / Not satisfactory

B. Teaching – Learning

10. In general, quality of teaching : Excellent / Good / Satisfactory / Not satisfactory
11. In general, discipline on campus : Excellent / Good / Satisfactory / Not satisfactory
12. Coverage of syllabus : 100% / <100% / <75%
13. Conducting of Lab experiments : Excellent / Good / Satisfactory / Not satisfactory
14. Counseling by teacher : Excellent / Good / Satisfactory / Not satisfactory

15. Interaction by teacher : Excellent / Good / Satisfactory / Not satisfactory
16. Other Activities : Excellent / Good / Satisfactory / Not satisfactory
17. Skills Imparted : Excellent / Good / Satisfactory / Not satisfactory
18. Access of teachers : Excellent / Good / Satisfactory / Not satisfactory
19. Attitude of teachers : Excellent / Good / Satisfactory / Not satisfactory
20. Regularity of teachers : Regular / Irregular / Occasionally irregular
21. Frequency of Internet use : Daily / Twice in a week / Once in a week
22. Frequency of Library use : Excellent / Good / Satisfactory / Not satisfactory
23. Transparency in evaluation system : Excellent / Good / Satisfactory / Not satisfactory
24. Security for girl students : Excellent / Good / Satisfactory / Not satisfactory
25. Training cell functions : Excellent / Good / Satisfactory / Not satisfactory
26. Placement cell functions : Excellent / Good / Satisfactory / Not satisfactory
27. Maintenance of communal harmony
on campus : Excellent / Good / Satisfactory / Not satisfactory
28. Accessibility of office staff : Excellent / Good / Satisfactory / Not satisfactory
29. Support by Lab Technicians : Excellent / Good / Satisfactory / Not satisfactory
30. Access and attitudes of HOD : Excellent / Good / Satisfactory / Not satisfactory
31. Access and attitudes of Deans : Excellent / Good / Satisfactory / Not satisfactory
32. Quality of Assessments/Examination : Excellent / Good / Satisfactory / Not satisfactory
33. Access to other related Sections : Excellent / Good / Satisfactory / Not satisfactory

C. Internship / Project

34. Seriousness of project work : Very serious / Moderate / No Seriousness
35. Quality of Internship : Excellent / Good / Satisfactory / Not satisfactory
36. Project guidance by the faculty : Excellent / Good / Satisfactory / Not satisfactory

Any other suggestions to make it into a centre of excellence for the future batches

1.
.....
2.
.....
3.
.....

Signature of the Student

| | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| our students competent | | | | | | | | | | | | | | | | |
| 7 list the courses make our students competent | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 comments about curricular aspects | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Feedback by Faculty | | | | | | | | | | | | | | | | |
| 1 opinion on curriculum which encompasses all thrust areas | Y | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 solve simple technical problems | Y | Y | Y | Y | Y | - | - | - | - | - | - | Y | - | - | - | - |
| 3 amalgamation of theoretical courses with practical sessions, modular courses, minor projects | Y | Y | Y | Y | Y | - | - | - | - | - | - | - | - | - | - | - |
| 4 competency of our student in comparison | Y | Y | Y | Y | Y | Y | - | - | Y | Y | Y | Y | - | - | - | - |
| 5 in tune with industry needs | Y | Y | Y | Y | Y | Y | - | - | Y | Y | - | Y | - | - | - | - |
| 6 well moulded to make our students entrepreneurs | - | - | - | - | - | Y | Y | Y | Y | Y | Y | Y | - | - | - | - |
| 7 suitable for national level competitive exams | Y | Y | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Feedback by Employers training our intern (guides) | | | | | | | | | | | | | | | | |
| 1 basic technical knowledge of interns | Y | Y | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 overall technical knowledge | Y | Y | Y | Y | - | - | - | - | - | - | - | - | - | - | - | - |
| 3 solve simple technical problems | Y | Y | Y | Y | - | - | - | - | - | - | - | Y | - | - | - | - |
| 4 knowledge to solve | Y | Y | Y | Y | - | - | - | - | - | - | - | Y | - | - | - | - |

| | | | | | | | | | | | | | | |
|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | Training cell functions | - | - | - | - | - | - | - | - | - | Y | Y | - | Y |
| 25 | Placement cell functions | - | - | - | - | - | - | - | - | - | Y | Y | - | Y |
| 26 | Maintenance of communal harmony on campus | - | - | - | - | - | - | - | - | Y | - | - | - | - |
| 27 | Accessibility of office staff | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 28 | Support by Lab Technicians | - | Y | Y | Y | Y | - | - | - | Y | Y | - | - | - |
| 29 | Access and attitude of HOD | - | - | - | - | - | - | - | - | Y | - | Y | - | - |
| 30 | Accessibility of the Director, DET | - | - | - | - | - | - | - | - | Y | - | Y | - | - |
| 31 | Seriousness of project work/Internship | - | Y | Y | Y | Y | - | - | - | - | - | - | - | - |
| 32 | Extra Projects | - | Y | Y | Y | Y | Y | - | - | - | - | - | - | - |
| 33 | Projects guidance by the faculty | Y | Y | Y | Y | Y | - | - | - | - | - | - | Y | - |

Following is a sample exit feedback form for the 2015-19 batch:

| S.no. | Action item | 151FA04108 | 151FA05003 | 151FA05010 | 151FA050113 | | Average scaled to 1 |
|--------------------------|--|------------|------------|------------|-------------|-------|---------------------|
| A. INFRASTRUCTURE | | | | | | | |
| 1 | Ambience of the instutution for learning | 3 | 2 | 3 | 3 | | 0.78 |
| 2 | Comfort of the Classroom | 3 | 2 | 3 | 3 | | 0.74 |
| 3 | Equipment of Lab | 3 | 2 | 3 | 3 | | 0.74 |
| 4 | Access of Library | 3 | 4 | 3 | 3 | | 0.82 |
| 5 | Internet Access | 3 | 3 | 3 | 3 | | 0.74 |
| 6 | Sports Facilities | 3 | 2 | 3 | 3 | | 0.77 |
| 7 | Cultural Activities | 3 | 3 | 3 | 3 | | 0.76 |
| 8 | Recreational Facilities | 3 | 2 | 3 | 3 | | 0.73 |
| 9 | Canteen Facilities | 3 | 1 | 2 | 3 | | 0.68 |

| B. TEACHING LEARNING | | | | | | | |
|-----------------------------|---|---|---|---|---|--|------|
| 10 | In general, quality of teaching | 3 | 3 | 3 | 3 | | 0.79 |
| 11 | In general, discipline on campus | 3 | 3 | 3 | 3 | | 0.79 |
| 12 | Coverage of syllabus | 3 | 4 | 4 | 4 | | 0.93 |
| 13 | Conducting of lab experiments | 3 | 3 | 3 | 3 | | 0.81 |
| 14 | Counseling by teacher | 3 | 3 | 3 | 3 | | 0.80 |
| 15 | Interaction by teacher | 3 | 3 | 3 | 3 | | 0.82 |
| 16 | Motivation of teachers | 3 | 3 | 2 | 3 | | 0.81 |
| 17 | Access of teachers | 3 | 3 | 3 | 3 | | 0.82 |
| 18 | Attitude of teacher | 4 | 3 | 3 | 3 | | 0.81 |
| 19 | Regularity of teacher | 4 | 4 | 4 | 4 | | 0.99 |
| 20 | Frequency of internet use | 4 | 3 | 3 | 3 | | 0.87 |
| 21 | Frequency of Library use | 4 | 3 | 3 | 3 | | 0.81 |
| 22 | Transparency in evaluation system | 4 | 3 | 3 | 3 | | 0.79 |
| 23 | Security for girl students | 4 | 3 | 4 | 4 | | 0.85 |
| 24 | Training cell functions | 4 | 3 | 3 | 3 | | 0.82 |
| 25 | Placement cell functions | 4 | 3 | 3 | 3 | | 0.82 |
| 26 | Maintenance of communal harmony on campus | 3 | 2 | 4 | 3 | | 0.81 |
| 27 | Accessibility of office staff | 3 | 3 | 3 | 3 | | 0.80 |
| 28 | Support by Lab Technicians | 3 | 3 | 3 | 3 | | 0.83 |
| 29 | Access and attitude of HOD | 3 | 3 | 3 | 3 | | 0.82 |
| 30 | Accessibility of the Director, DEM | 3 | 3 | 3 | 3 | | 0.82 |

| C. RESEARCH | | | | | | | |
|--------------------|--|---|---|---|---|--|------|
| 31 | Seriousness of project work/Internship | 3 | 4 | 3 | 4 | | 0.88 |
| 32 | Extra Projects | 3 | 3 | 3 | 3 | | 0.79 |
| 33 | Projects guidance by the faculty | 3 | 3 | 3 | 3 | | 0.81 |

PO attainment table from exit feedback:

| Sl. No. | | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|-----------------------------|--|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| A. INFRASTRUCTURE | | | | | | | | | | | | | |
| 1 | Ambience of the instutution for learning | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 | Comfort of the Classroom | - | - | - | - | - | - | - | - | - | - | - | - |
| 3 | Equipment of Lab | - | - | 3.00 | - | - | - | - | - | - | - | - | - |
| 4 | Access of Library | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 | Internet Access | - | - | - | - | - | - | - | - | - | - | - | - |
| 6 | Sports Facilities | - | - | - | - | - | - | - | - | 3.00 | 3.00 | - | - |
| 7 | Cultural Activities | - | - | - | - | - | - | - | - | 3.00 | 3.00 | - | - |
| 8 | Recreational Facilities | - | - | - | - | - | - | - | - | - | - | - | - |
| 9 | Canteen Facilities | - | - | - | - | - | - | - | - | - | - | - | - |
| B. TEACHING LEARNING | | | | | | | | | | | | | |
| 10 | In general, quality of teaching | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | - | 3.00 | - | - | - | 3.0 |
| 11 | In geneal, discipline on campus | - | - | - | - | - | 3.00 | 3.00 | 3.00 | - | - | - | - |
| 12 | Coverage of syllabus | 3.00 | - | - | - | - | - | - | - | - | - | - | 3.00 |
| 13 | Conducting of lab experiments | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | - | - | - | - | - | - | 3.00 |
| 14 | Counceling by teacher | - | - | - | - | - | - | - | 3.00 | - | 3.00 | - | 3.00 |

Satisfactory response of POs for Indirect Assessment:

1. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response (%) |
|--|----------------------|--|
| Parents feedback | 68 | 79 |
| Final Year Students feedback | 88 | 98 |
| Feedback by Faculty | 18 | 89 |
| Feedback by Employers training our intern (guides) | 32 | 87 |
| Feedback on Curriculum from current students | 33 | 68 |

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response (%) |
|--|----------------------|--|
| Parents feedback | 68 | 83 |
| Final Year Students feedback | 88 | 98 |
| Feedback by Faculty | 18 | 90 |
| Feedback by Employers training our intern (guides) | 32 | 87 |
| Feedback on Curriculum from current students | 33 | 69 |

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response (%) |
|--|----------------------|--|
| Parents feedback | 68 | 83 |
| Final Year Students feedback | 88 | 97 |
| Feedback by Faculty | 18 | 87 |
| Feedback by Employers training our intern (guides) | 32 | 92 |
| Feedback on Curriculum from current students | 33 | 69 |

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response |
|---------------|----------------------|--------------------------------------|
|---------------|----------------------|--------------------------------------|

| | | (%) |
|--|----|-----|
| Final Year Students feedback | 88 | 97 |
| Feedback by Faculty | 18 | 87 |
| Feedback by Employers training our intern (guides) | 32 | 92 |
| Feedback on Curriculum from current students | 33 | 69 |

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response (%) |
|--|---------------|-----------------------------------|
| Final Year Students feedback | 88 | 97 |
| Feedback by Faculty | 18 | 87 |
| Feedback by Employers training our intern (guides) | 32 | 100 |
| Feedback on Curriculum from current students | 33 | 67 |

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response (%) |
|--|---------------|-----------------------------------|
| Parents feedback | 68 | 77 |
| Final Year Students feedback | 88 | 97 |
| Feedback by Faculty | 18 | 92 |
| Feedback by Employers training our intern (guides) | 32 | 100 |
| Feedback on Curriculum from current students | 33 | 66 |

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response (%) |
|---------------------|---------------|-----------------------------------|
| Parents feedback | 68 | 75 |
| Feedback by Faculty | 18 | 95 |

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response (%) |
|--|---------------|-----------------------------------|
| Parents feedback | 68 | 75 |
| Feedback by Faculty | 18 | 95 |
| Feedback on Curriculum from current students | 33 | 67 |

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response (%) |
|--|---------------|-----------------------------------|
| Parents feedback | 68 | 77 |
| Final Year Students feedback | 88 | 97 |
| Feedback by Faculty | 18 | 92 |
| Feedback by Employers training our intern (guides) | 32 | 100 |
| Feedback on Curriculum from current students | 33 | 66 |

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response (%) |
|--|---------------|-----------------------------------|
| Parents feedback | 68 | 77 |
| Final Year Students feedback | 88 | 97 |
| Feedback by Faculty | 18 | 92 |
| Feedback by Employers training our intern (guides) | 32 | 100 |
| Feedback on Curriculum from current students | 33 | 66 |

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response (%) |
|--|---------------|-----------------------------------|
| Parents feedback | 68 | 82 |
| Final Year Students feedback | 88 | 92 |
| Feedback by Faculty | 18 | 88 |
| Feedback on Curriculum from current students | 33 | 67 |

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Indirect Assessment

| Survey | No of Samples | Average Satisfactory response (%) |
|--|---------------|-----------------------------------|
| Parents feedback | 68 | 80 |
| Final Year Students feedback | 88 | 97 |
| Feedback by Faculty | 18 | 90 |
| Feedback by Employers training our intern (guides) | 32 | 89 |
| Feedback on Curriculum from current students | 33 | 66 |

| | | | | | | | | | | | | | | | | | |
|-------|---|---|---|---|---|---|---|---|--|--|---|---|---|---|---|---|---|
| C124 | 2 | HS114 - Technical English Communication | | | | | | | | | | 2 | 2 | 3 | | | |
| C125 | 2 | HS115 - Engineering Mathematics - II | 3 | 2 | | | | | | | | | | 2 | 2 | 3 | |
| C126 | 2 | ME101 - Engineering Mechanics | 2 | 2 | 2 | | | | | | | | | | | | |
| C127 | 2 | CS107 - Computer Programming Lab | 2 | 2 | 2 | 3 | | | | | | | | | 2 | 1 | 2 |
| C128 | 2 | HS120 - Engineering Physics lab | 2 | 2 | | | | | | | | | | | | | |
| C129 | 2 | ME105 - Workshop Practical Lab | 2 | 2 | | | | | | | | | | | | | |
| C211 | 3 | EC217 - Network Theory | 2 | 2 | | 2 | | | | | | | | | | | 2 |
| C212 | 3 | EC219 - Electronic Devices and Circuits | 2 | 2 | 2 | 3 | | | | | | | | 2 | | | 2 |
| C213 | 3 | EC221 - Signals and Systems | 2 | 2 | | 1 | | | | | | | | 2 | 2 | | |
| C214 | 3 | HS215 - Complex Variables and Special Functions | 3 | 3 | 1 | 1 | | | | | | | | | 2 | | |
| C215 | 3 | CS231 - Data Structures using C++ | 3 | 3 | 3 | | | | | | | | | | | | |
| C216 | 3 | EC209 - Signals and Systems Lab | 3 | 3 | 2 | 3 | 3 | | | | 2 | 2 | 2 | 3 | 3 | | |
| C217 | 3 | Electronic Devices and Circuits Lab | 3 | 2 | 1 | | 2 | | | | 2 | 1 | | | 3 | | 2 |
| C218A | 3 | CS223 - Object Oriented Programming through Java | 3 | 2 | 3 | | 3 | | | | 2 | 2 | 2 | 2 | | 3 | |
| C218B | 3 | HS219 - Indian History and Culture | | | | | | 3 | | | 2 | | | | | | |
| C218C | 3 | MS203 - Principles of Management and Organizational behaviour | 2 | 3 | 3 | | 1 | 3 | | | 2 | 2 | | 1 | | | |

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|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C219 | 3 | HS217 - Soft Skills Lab | | | | | | 3 | 2 | 2 | 2 | 3 | | 3 | | | |
| C220 | 3 | SR002 - Seminar | 3 | | | | 3 | | | | 2 | 2 | | 3 | 3 | 3 | 3 |
| C221 | 4 | EC224 - Probability Theory and Stochastic Process | 1 | 1 | | 1 | | | | | | | | | 2 | | |
| C222 | 4 | EC226 - Electronic Circuit Analysis | 1 | 1 | 2 | 1 | 1 | | | | | | | | | | 1 |
| C223 | 4 | EC228 - Digital Electronics | 2 | 2 | 2 | 1 | | | | | | | | | | 1 | 2 |
| C224 | 4 | EC230 - Analog Communications | 2 | 2 | 1 | 1 | 1 | 1 | | | | 1 | | | 2 | | |
| C225 | 4 | EC232 - Electro Magnetic Field Theory | 1 | 1 | | 1 | | | | | | | | | 2 | | |
| C226 | 4 | EC234 - Electronic Circuit Analysis Lab | 3 | 3 | | 2 | 2 | | | | 2 | 2 | | 2 | 2 | | 2 |
| C227 | 4 | EC236 - Analog Communications Lab | 3 | 2 | 2 | 3 | 2 | | | | 2 | 2 | | 2 | 3 | | |
| C228A | 4 | Operating Systems | 2 | 2 | 2 | | | | | | | | | | | 2 | |
| C228B | 4 | Business Environment and Ethics | 3 | 2 | | | 1 | 2 | 2 | 3 | 2 | 3 | | 1 | | | |
| C228C | 4 | Polity and Governance of India | | | | | | 2 | | | 2 | | | | | | |
| C229 | 4 | HS304 - Professional Communication Lab | | | | | | | 2 | | | 3 | | 2 | | | |
| C230 | 4 | SR003 - Seminar | 3 | | | | 3 | | | | 2 | 2 | | 3 | 3 | 3 | 3 |
| C311 | 5 | EC317 - Linear ICs and Applications | 2 | 2 | 2 | 1 | | | | | 2 | | | | 2 | | 2 |
| C312 | 5 | EC319 - Microprocessor and Microcontrollers | 3 | 2 | 1 | 2 | | | | | | | | 2 | | 3 | |
| C313 | 5 | EC321 - Digital Communications | 2 | 2 | | 2 | | | | | | | | 1 | 2 | | |
| C314 | 5 | EC331 - Digital Communications Lab | 3 | 3 | 3 | 3 | 3 | | | | 2 | 2 | 2 | 2 | 3 | | |

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|-------|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Engineering | | | | | | | | | | | | | | | |
| C328B | 6 | HS403 - Geography and Environmental Concerns of India | | | | | | 3 | 3 | | | | | 3 | | | |
| C328C | 6 | MS312 - Entrepreneurship and Project Management | 2 | 1 | 1 | | 2 | | 3 | | 2 | 1 | 2 | | | | |
| C329 | 6 | EC334 - Mini Project | 3 | 3 | 2 | 2 | 3 | | 1 | 3 | 3 | 2 | 3 | | 3 | 3 | 3 |
| C330 | 6 | SR005 - Seminar | 3 | | | | 3 | | | | 2 | 2 | | 3 | 3 | 3 | 3 |
| C411 | 7/8 | EC431 - Digital Signal Processing | 2 | 2 | 3 | 1 | | | | | | | | 2 | 3 | | |
| C412 | 7/8 | EC433 - RF and Microwave Engineering | 2 | 2 | | 1 | | | | | | | | 1 | 3 | | |
| C413 | 7/8 | EC435 - Electronic Measurements and Instrumentation | 2 | 2 | 1 | 1 | | | | | | | | 1 | 1 | 2 | |
| C414 | 7/8 | MS310 - Managerial Economics | 2 | 2 | | 2 | 1 | | 2 | | 1 | | | 1 | | | |
| C415 | 7/8 | EC449 - Digital Signal Processing Lab | 3 | 2 | 2 | 3 | 3 | | | | 2 | 1 | | | 3 | | |
| C416 | 7/8 | EC451 - Microwave Engineering Lab | 3 | 2 | | 2 | | | | | 2 | 1 | | 2 | 2 | | |
| C417 | 7/8 | EC453 - Instrumentation Lab | 3 | 3 | 2 | 3 | 3 | | | | 2 | 1 | 1 | 3 | 2 | 2 | |
| C418A | 7/8 | EC437 - Data Communications and Computer Networks | 3 | 2 | 1 | 2 | | | | | | | | 2 | 2 | 2 | |
| C418B | 7 | EC443 - Digital design through Verilog | 2 | | 3 | 2 | 3 | | | | | | | | | 2 | 3 |
| C418C | 7/8 | EC445 - Cellular and Mobile Communications | 3 | 2 | 2 | 2 | | | | | | | | 2 | 2 | 2 | |
| C419A | 7/8 | HS403 - Geography and Environmental Concerns of | | | | | | 3 | 3 | | | | | 3 | | | |

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|--------------------------|-----|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | India | | | | | | | | | | | | | | | |
| C419B | 7/8 | MS409 - Production and Operations Management | 2 | 2 | 1 | | 2 | | | | | | 1 | 2 | | | |
| C419C | 7/8 | CS435 - Software Testing Methodologies | 1 | 2 | 2 | 1 | 3 | | | | | | | | | | |
| C420 | 7/8 | EC426 - Internship | 3 | 3 | 2 | 3 | 3 | | 1 | 3 | 3 | 2 | 3 | | 3 | 3 | 3 |
| C428A | 8 | EC463 - Internet of things | 2 | 2 | 2 | | 2 | 2 | | | | | | | 2 | 3 | |
| C428B | 8 | EC414 - Wireless sensors network | 3 | 2 | 2 | 2 | | | | | | | | | 2 | 2 | |
| C428C | 8 | EC420 - Radar systems | 3 | 3 | 2 | | | | | | | | | | 3 | | |
| C421 | 8 | EC424 - Project | 3 | 3 | 2 | 3 | 3 | | 1 | 3 | 3 | 2 | 3 | | 3 | 3 | 3 |
| Direct Assessment | | | 2.45 | 2.17 | 2.10 | 1.91 | 2.29 | 2.21 | 2.13 | 2.56 | 2.07 | 1.93 | 2.08 | 1.98 | 2.37 | 2.32 | 2.28 |
| 80% of Direct Assessment | | | 1.96 | 1.74 | 1.68 | 1.53 | 1.83 | 1.77 | 1.71 | 2.04 | 1.65 | 1.54 | 1.67 | 1.58 | 1.89 | 1.86 | 1.82 |

Indirect Assessment Table

| Survey | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Parents feedback | 2.50 | 3.00 | 3.00 | - | - | 2.30 | 2.00 | 3.00 | 2.30 | 2.33 | 3.00 | 2.50 | | | |
| Final Year Students feedback | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | - | - | 3.00 | 3.00 | 3.00 | 3.00 | | | |
| Feedback by Faculty | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | | | |
| Feedback by Employers training our intern (guides) | 2.60 | 2.60 | 2.80 | 2.80 | 3.00 | 3.00 | - | - | 3.00 | 3.00 | - | 2.67 | | | |
| Feedback on Curriculum from current students | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | - | 3.00 | 2.00 | 2.00 | 2.00 | 2.00 | | | |
| Alumni Direct Feedback | 2.20 | 2.10 | 2.20 | 2.10 | 2.10 | 2.20 | 2.30 | 3.00 | 2.40 | 2.31 | 2.22 | 2.28 | 3.00 | 3.00 | 3.00 |

| | | | | | | | | | | | | | | | |
|-------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Final attainment from exit feedback | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | | | |
| Indirect Attainment | 2.61 | 2.67 | 2.71 | 2.65 | 2.68 | 2.64 | 2.58 | 3.00 | 2.67 | 2.66 | 2.70 | 2.64 | 3.00 | 3.00 | 3.00 |
| 20% of Indirect Attainment | 0.52 | 0.53 | 0.54 | 0.53 | 0.54 | 0.53 | 0.52 | 0.60 | 0.53 | 0.53 | 0.54 | 0.53 | 0.60 | 0.60 | 0.60 |

Overall Attainment of Program Outcomes

| Overall Attainment of PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 80% of Direct Attainment | 1.96 | 1.74 | 1.68 | 1.53 | 1.83 | 1.77 | 1.71 | 2.04 | 1.65 | 1.54 | 1.67 | 1.58 | 1.89 | 1.86 | 1.82 |
| 20% of Indirect Attainment | 0.52 | 0.53 | 0.54 | 0.53 | 0.54 | 0.53 | 0.52 | 0.60 | 0.53 | 0.53 | 0.54 | 0.53 | 0.60 | 0.60 | 0.60 |
| OverallAttainment | 2.48 | 2.27 | 2.22 | 2.06 | 2.37 | 2.30 | 2.22 | 2.64 | 2.19 | 2.08 | 2.21 | 2.11 | 2.49 | 2.46 | 2.42 |