

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: ELECTRICAL MACHINES

COURSE CODE: ET20403

CREDITS: 4

DEPARTMENT: B. Sc. EEELECTRONICS AND COMMUNICATIONS TECHNOLOGY

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. 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.
- **PO3. Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6. Individual and team work:** Function objectively as an individual and as a member in diverse teams.

- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognize the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

- **PSO 1:** Students will be able to understand the concepts and apply fundamentals of electronics in various domains of analog and digital systems.
- **PSO 2:** Design and analyze various functional elements of different modes of communications systems.
- **PSO 3:** Implement and demonstrate variety of automation systems by controlling, processing different signals according to the required specifications.
- **PSO 4:** Compete with the people who are using electronic hardware and software IT tools for the design and analysis of complex electronic systems in furtherance to research activities.
- **PSO 5:** Excellent adaptability to changing work environment, good inter personal skills as a leader in a team with good skills to communicate in both oral and written forms.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|------------|---|-------------------------------|
| CO1 | CO1: Understand the operation and Construction of DC Generator | II (UNDERSTANDING) |
| CO2 | CO2: Understand the operation and Construction of DC motor | II (UNDERSTANDING) |
| CO3 | CO3: Develop equivalent circuit and evaluate performance of Transformer | IV(ANALYZE) |

| | | |
|------------|--|--------------------|
| CO4 | CO4: Understand the operation and Construction of Induction Machines | II (UNDERSTANDING) |
| CO5 | CO5: Understand the operation of Various special machine | IV(ANALYZE) |

Table 1: CO, PO, PSO MAPPING

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|-----------------|--------------------|-----|-----|-----|-----|-----|-----|-----|---------------------------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | H | H | S | S | | S | H | S | S | S | H | S |
| 2 | H | H | H | S | S | | S | H | S | S | S | H | S |
| 3 | H | H | H | H | H | | H | H | S | S | S | H | H |
| 4 | H | H | H | S | H | | S | H | S | S | S | H | S |
| 5 | H | H | H | H | H | | H | H | S | S | S | H | S |

H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

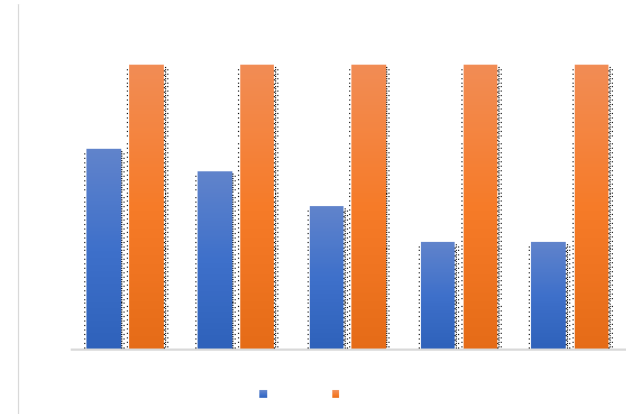
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 75%- 65%= 1

Pass percent of less than 65%= 0_



| CO | WEEKLY TEST | | MID SEM | | PREFINAL | | ASSIGNMENT | | VIVA-VOCE | | ATTENDANCE | | co wise internal average | External Exam | | | |
|-----|-------------|------------------|---------|------------------|----------|------------------|------------|------------------|-----------|------------------|------------|------------------|--------------------------|--------------------------|-----------------------|-----|-----|
| | pass% | Attainment level | pas% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | | co wise external average | co wise total average | | |
| CO1 | 96.0 | 3.0 | | | 88.0 | 3.0 | 100.0 | 3.0 | 100.0 | 3.0 | 38.0 | 0.0 | 2.4 | 96.0 | 3.0 | 3.0 | 2.8 |
| CO2 | 96.0 | 3.0 | | | 88.0 | 3.0 | | | 100.0 | 3.0 | 38.0 | 0.0 | 2.3 | 96.0 | 3.0 | 3.0 | 2.7 |
| CO3 | 96.0 | 3.0 | 74.0 | 1.0 | 88.0 | 3.0 | | | 100.0 | 3.0 | 38.0 | 0.0 | 2.0 | 96.0 | 3.0 | 3.0 | 2.6 |
| CO4 | | | 74.0 | 1.0 | 88.0 | 3.0 | | | 100.0 | 3.0 | 38.0 | 0.0 | 1.8 | 96.0 | 3.0 | 3.0 | 2.5 |
| CO5 | | | 74.0 | 1.0 | 88.0 | 3.0 | | | 100.0 | 3.0 | 38.0 | 0.0 | 1.8 | 96.0 | 3.0 | 3.0 | 2.5 |

| AVERAGE | AVERAGE |
|---------|---------|
| 3 | 2.612 |

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

Table 3: PROGRAMME OUTCOME MAPPING

[Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]



| OUTCOME | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------------------|-------------|--------|--------|--------|--------|-----|--------|--------|
| CO1 | H 2.76 | H 2.76 | H 2.76 | | | | | H 2.76 |
| CO2 | H 2.7 | H 2.7 | H 2.7 | | | | | H 2.7 |
| CO3 | H 2.76 | H 2.76 | H 2.76 | H 2.76 | H 2.76 | | H 2.76 | H 2.76 |
| CO4 | H 2.7 | H 2.7 | H 2.7 | | H 2.7 | | | H 2.7 |
| CO5 | H 2.7 | H 2.7 | H 2.7 | H 2.7 | H 2.7 | | H 2.7 | H 2.7 |
| AVERAGE OF COS FOR POS | 2.724 | 2.724 | 2.724 | 2.73 | 2.72 | | 2.73 | 2.724 |
| AVERAGE OF POS | 2.7168 | 2.7168 | 2.7168 | 2.73 | 2.72 | | 2.73 | 2.7168 |
| AVERAGE | 2.721028571 | | | | | | | |

Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: INDUSTRIAL ELECTRONICS

COURSE CODE: ET21505B

CREDITS: 4

DEPARTMENT: B. Sc. EEELECTRONICS AND COMMUNICATIONS TECHNOLOGY

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. 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.
- **PO3. Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6. Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognize the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

- **PSO 1:** Students will be able to understand the concepts and apply fundamentals of electronics in various domains of analog and digital systems.
- **PSO 2:** Design and analyze various functional elements of different modes of communications systems.
- **PSO 3:** Implement and demonstrate variety of automation systems by controlling, processing different signals according to the required specifications.
- **PSO 4:** Compete with the people who are using electronic hardware and software IT tools for the design and analysis of complex electronic systems in furtherance to research activities.
- **PSO 5:** Excellent adaptability to changing work environment, good inter personal skills as a leader in a team with good skills to communicate in both oral and written forms.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|------------|---|-------------------------------|
| CO1 | CO1: Analyse the steady state and small signal AC response of simple electronic circuits containing diodes, transistors, and operational amplifiers | IV(ANALYZE) |
| CO2 | CO2: Apply performance criteria in the design of basic amplifier circuits | III (APPLY) |
| CO3 | CO3: Design and analyse circuits containing digital components and microprocessors. | IV(ANALYZE) |
| CO4 | CO4: Analyse and evaluate performance parameters of AC and DC motors. | IV(ANALYZE) |
| CO5 | CO5: Analyse the steady state and small signal AC response of simple electronic circuits containing diodes, transistors, and operational amplifiers | IV(ANALYZE) |

Table 1: CO, PO, PSO MAPPING

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|-----------------|--------------------|-----|-----|-----|-----|-----|-----|-----|---------------------------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | H | H | H | S | | S | H | H | S | S | H | H |
| 2 | H | H | H | H | S | | S | H | H | S | H | H | H |
| 3 | H | H | H | H | S | | S | H | H | S | H | H | H |
| 4 | H | H | H | H | S | | S | H | H | S | H | H | H |
| 5 | H | H | H | H | S | | S | H | H | S | S | H | H |

H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3

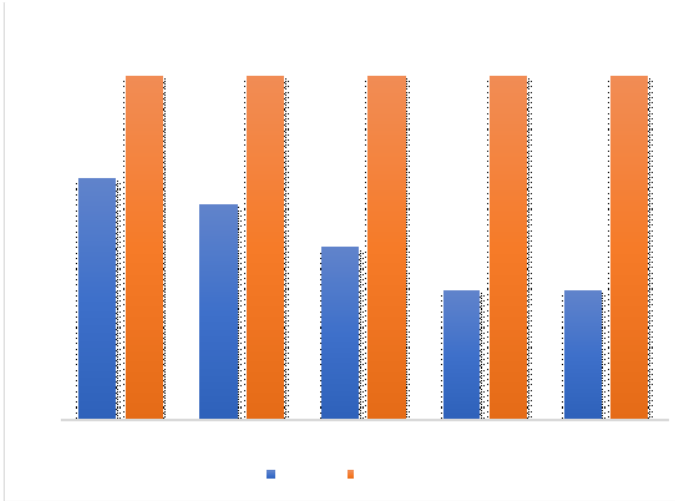
Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.



| co | mid exam 1 | | mid exam 2 | | group discussion | | assignment | | viva | | Attendance | | External Exam | | | | |
|-----|------------|------------------|------------|------------------|------------------|------------------|------------|------------------|-------|------------------|------------|------------------|--------------------------|-------|------------------|--------------------------|-----------------------|
| | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | co wise internal average | pass% | Attainment level | co wise external average | co wise total average |
| CO1 | 100.0 | 3.0 | | | 100.0 | 3.0 | 100.0 | 3.0 | 100.0 | 3.0 | 56.5 | 0.0 | 2.4 | 95.7 | 3.0 | 3.0 | 2.8 |
| CO2 | 100.0 | 3.0 | | | 100.0 | 3.0 | | | 100.0 | 3.0 | 56.5 | 0.0 | 2.3 | 95.7 | 3.0 | 3.0 | 2.7 |
| CO3 | 100.0 | 3.0 | 65.2 | 1.0 | 100.0 | 3.0 | | | 100.0 | 3.0 | 56.5 | 0.0 | 2.0 | 95.7 | 3.0 | 3.0 | 2.6 |
| CO4 | | | 65.2 | 1.0 | 100.0 | 3.0 | | | 100.0 | 3.0 | 56.5 | 0.0 | 1.8 | 95.7 | 3.0 | 3.0 | 2.5 |
| CO5 | | | 65.2 | 1.0 | 100.0 | 3.0 | | | 100.0 | 3.0 | 56.5 | 0.0 | 1.8 | 95.7 | 3.0 | 3.0 | 2.5 |

| AVERAGE | AVERAGE |
|---------|---------|
| 3 | 2.612 |

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

- 1. Copy the completed table 1.**
- 2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the ‘S’ points]**
- 3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]**



| OUTCOME | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------------------|--------|--------|--------|--------|-----|-----|-----|--------|
| CO1 | H 2.76 | H 2.76 | H 2.76 | H 2.76 | | | | H 2.76 |
| CO2 | H 2.7 | H 2.7 | H 2.7 | H 2.7 | | | | H 2.7 |
| CO3 | H 2.6 | H 2.6 | H 2.6 | H 2.6 | | | | H 2.6 |
| CO4 | H 2.5 | H 2.5 | H 2.5 | H 2.5 | | | | H 2.5 |
| CO5 | H 2.5 | H 2.5 | H 2.5 | H 2.5 | | | | H 2.5 |
| AVERAGE OF COS FOR POS | 2.612 | 2.612 | 2.612 | 2.612 | | | | 2.612 |
| AVERAGE OF POS | 2.5824 | 2.5824 | 2.5824 | 2.5824 | | | | 2.5824 |
| AVERAGE | 2.5824 | | | | | | | |

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: VHDL PROGRAMMING

COURSE CODE: ET21504B

CREDITS: 4

DEPARTMENT: B. Sc. EEELECTRONICS AND COMMUNICATIONS TECHNOLOGY

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. 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.
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PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

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- **PSO 2:** Design and analyze various functional elements of different modes of communications systems.
- **PSO 3:** Implement and demonstrate variety of automation systems by controlling, processing different signals according to the required specifications.
- **PSO 4:** Compete with the people who are using electronic hardware and software IT tools for the design and analysis of complex electronic systems in furtherance to research activities.
- **PSO 5:** Excellent adaptability to changing work environment, good inter personal skills as a leader in a team with good skills to communicate in both oral and written forms.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|------------|--|-------------------------------|
| CO1 | CO1: Able to understand the fundamental concepts of VHDL, Data types & Operations. | II (UNDERSTANDING) |
| CO2 | CO2: Able to learn the programming structures and composite data types & Operations. | III (APPLY) |
| CO3 | CO3: Able to learn basic modeling structures and subprograms. | IV(ANALYZE) |
| CO4 | CO4: Able to learn the programming structures like package declarations, clauses, Predefined package standard. | IV(ANALYZE) |
| CO5 | Able to learn Xilinx tool and implementation of it in digital designing. | IV(ANALYZE) |

Table 1: CO, PO, PSO MAPPING

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|-----------------|--------------------|-----|-----|-----|-----|-----|-----|-----|---------------------------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | S | H | H | S | | S | H | H | S | S | H | H |
| 2 | H | H | H | H | S | | S | H | H | S | H | H | H |
| 3 | H | H | H | H | S | | S | H | H | S | H | H | H |
| 4 | H | H | H | H | S | | S | H | H | S | H | H | H |
| 5 | H | H | H | H | S | | S | H | H | S | S | H | H |

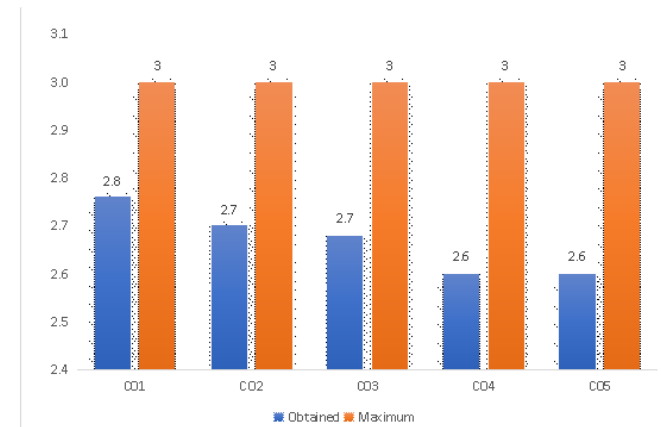
H: Highly Supportive

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Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

- Pass percent of 85% and above= 3
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| co | mid exam 1 | | mid exam 2 | | group discussion | | assignment | | viva | | Attendance | | External Exam | | | | |
|-----|------------|------------------|------------|------------------|------------------|------------------|------------|------------------|-------|------------------|------------|------------------|--------------------------|-------|------------------|--------------------------|-----------------------|
| | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | co wise internal average | pass% | Attainment level | co wise external average | co wise total average |
| CO1 | 88.9 | 3.0 | | | 100.0 | 3.0 | 100.0 | 3.0 | 100.0 | 3.0 | 48.1 | 0.0 | 2.4 | 92.6 | 3.0 | 3.0 | 2.8 |
| CO2 | 88.9 | 3.0 | | | 100.0 | 3.0 | | | 100.0 | 3.0 | 48.1 | 0.0 | 2.3 | 92.6 | 3.0 | 3.0 | 2.7 |
| CO3 | 88.9 | 3.0 | 77.8 | 2.0 | 100.0 | 3.0 | | | 100.0 | 3.0 | 48.1 | 0.0 | 2.2 | 92.6 | 3.0 | 3.0 | 2.7 |
| CO4 | | | 77.8 | 2.0 | 100.0 | 3.0 | | | 100.0 | 3.0 | 48.1 | 0.0 | 2.0 | 92.6 | 3.0 | 3.0 | 2.6 |
| CO5 | | | 77.8 | 2.0 | 100.0 | 3.0 | | | 100.0 | 3.0 | 48.1 | 0.0 | 2.0 | 92.6 | 3.0 | 3.0 | 2.6 |

| AVERAGE | AVERAGE |
|---------|---------|
| 3 | 2.668 |

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

- 1. Copy the completed table 1.**
- 2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the ‘S’ points]**
- 3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]**



| OUTCOME | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------------------|-------------|-----|--------|--------|--------|-----|--------|-------|
| CO1 | H 2.76 | | H 2.76 | | | | | |
| CO2 | H 2.7 | | H 2.7 | H 2.7 | | | H 2.7 | |
| CO3 | H 2.68 | | H 2.68 | H 2.68 | H 2.68 | | H 2.68 | |
| CO4 | H 2.6 | | H 2.6 | H 2.6 | | | H 2.6 | |
| CO5 | H 2.6 | | H 2.6 | H 2.6 | | | | H 2.6 |
| AVERAGE OF COS FOR POS | 2.668 | | 2.668 | 2.645 | 2.68 | | 2.66 | 2.6 |
| AVERAGE OF POS | 2.6496 | | 2.6496 | 2.645 | 2.68 | | 2.66 | 2.6 |
| AVERAGE | 2.647366667 | | | | | | | |

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Mobile Communication

COURSE CODE: ET21606B

CREDITS: 4

DEPARTMENT: ELECTRONICS& COMMUNICATION TECHNOLOGY

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :

BSc.

- PO1. Scientific Knowledge. Apply the knowledge of Science, Mathematics, Engineering Technology fundamentals to solve the complex problems.
- PO2. 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.
- PO3. Problem analysis: Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO4. Modern tool usage: Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
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- PO7. Communication: Communicate effectively on complex science & technology activities with society at large and able to write

effective reports and documentation.

- PO8. Life-long learning: Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

PSO 1:

Students will be able to understand the concepts and apply fundamentals of electronics in various domains of analog and digital systems.

PSO 2:

Design and analyze various functional elements of different modes of communications systems.

PSO 3:

Implement and demonstrate variety of automation systems by controlling, processing different signals according to the required specifications.

PSO 4:

Compete with the people who are using electronic hardware and software IT tools for the design and analysis of complex electronic systems in furtherance to research activities.

PSO 5:

Excellent adaptability to changing work environment, good inter personal skills as a leader in a team with good skills to communicate in both oral and written forms.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|------------|---|-------------------------------|
| CO1 | The student will be able to understand the structure of basic mobile cellular systems | II (UNDERSTAND) |
| CO2 | The student will be able to analyze Co-channel and Non Co-channel interferences. | IV(ANALYZE) |
| CO3 | The student will know the importance of frequency management, Channel assignment, and types of handoff. | V(EVALUATE) |

| | | |
|------------|--|-----------------|
| CO4 | The student will be able to have knowledge on basic GSM system. | II (UNDERSTAND) |
| CO5 | The student will be able to identify call setup procedure, ensuring privacy and authentication of user for GSM system. | III(APPLYING) |

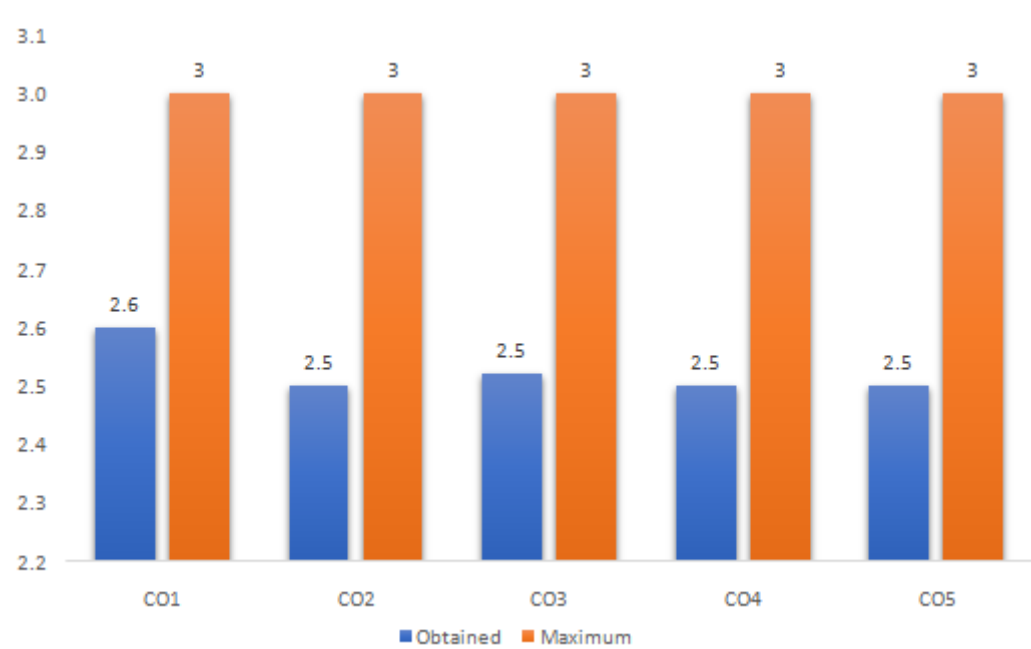
TABLE 1: CO, PO, PSO MAPPING

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|-----------------|--------------------|-----|-----|-----|-----|-----|-----|-----|---------------------------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | | | H | | | H | H | S | S | | | |
| 2 | H | | | | | | H | H | S | S | | | |
| 3 | H | | | H | | | H | | S | S | | S | |
| 4 | H | H | | | H | | H | | S | S | | S | |
| 5 | H | | H | | H | | H | | S | S | | S | |

H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT



| co | WEEKLY TEST | | MID SEM | | PREFINAL | | ASSIGNMENT | | VIVA-VOCE | | ATTENDENCE | | co wise internal average | External Exam | | | co wise total average |
|-----|-------------|------------------|---------|------------------|----------|------------------|------------|------------------|-----------|------------------|------------|------------------|--------------------------|---------------|------------------|--------------------------|-----------------------|
| | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | | pass% | Attainment level | co wise external average | |
| C01 | 80.8 | 2.0 | | | 76.9 | 2.0 | 100.0 | 3.0 | 100.0 | 3.0 | 7.7 | 0.0 | 2.0 | 96.2 | 3.0 | 3.0 | 2.6 |
| C02 | 80.8 | 2.0 | | | 76.9 | 2.0 | | | 100.0 | 3.0 | 7.7 | 0.0 | 1.8 | 96.2 | 3.0 | 3.0 | 2.5 |
| C03 | 80.8 | 2.0 | 84.6 | 2.0 | 76.9 | 2.0 | | | 100.0 | 3.0 | 7.7 | 0.0 | 1.8 | 96.2 | 3.0 | 3.0 | 2.5 |
| C04 | | | 84.6 | 2.0 | 76.9 | 2.0 | | | 100.0 | 3.0 | 7.7 | 0.0 | 1.8 | 96.2 | 3.0 | 3.0 | 2.5 |
| C05 | | | 84.6 | 2.0 | 76.9 | 2.0 | | | 100.0 | 3.0 | 7.7 | 0.0 | 1.8 | 96.2 | 3.0 | 3.0 | 2.5 |

| AVERAGE | AVERAGE |
|---------|---------|
| 3 | 2.524 |

Table 3: PROGRAMME OUTCOME MAPPING



| OUTCOME | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------------------|--------|-------|-------|--------|-------|-----|--------|-------|
| CO1 | H 2.6 | | | H 2.6 | | | H 2.6 | H 2.6 |
| CO2 | H 2.5 | | | | | | H 2.5 | H 2.5 |
| CO3 | H 2.52 | | | H 2.52 | | | H 2.52 | |
| CO4 | H 2.5 | H 2.5 | | | H 2.5 | | H 2.5 | |
| CO5 | H 2.5 | | H 2.5 | | H 2.5 | | H 2.5 | |
| AVERAGE OF COS FOR POS | 2.524 | 2.5 | 2.5 | 2.56 | 2.5 | | 2.524 | 2.55 |
| AVERAGE OF POS | 2.5088 | 2.5 | 2.5 | 2.54 | 2.5 | | 2.5088 | 2.525 |
| AVERAGE | 2.5118 | | | | | | | |

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: ELECTROMAGNETIC THEORY

COURSE CODE:ET18203

CREDITS: 3

DEPARTMENT: ELECTRONICS& COMMUNICATION TECHNOLOGY

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :

BSc.

- PO1. Scientific Knowledge. Apply the knowledge of Science, Mathematics, Engineering&Technology fundamentals to solve the complex problems.
 - PO2. 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.
 - PO3.Problem analysis: Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
 - PO4. Modern tool usage: Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
 - PO5. Environment and sustainability: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
 - PO6.Individual and team work: Function objectively as an individual and as a member in diverse teams.
- PO7. Communication: Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.

- PO8. Life-long learning: Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

PSO 1:

Students will be able to understand the concepts and apply fundamentals of electronics in various domains of analog and digital systems.

PSO 2:

Design and analyze various functional elements of different modes of communications systems.

PSO 3:

Implement and demonstrate variety of automation systems by controlling, processing different signals according to the required specifications.

PSO 4:

Compete with the people who are using electronic hardware and software IT tools for the design and analysis of complex electronic systems in furtherance to research activities.

PSO 5:

Excellent adaptability to changing work environment, good inter personal skills as a leader in a team with good skills to communicate in both oral and written forms.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|------------|---|-------------------------------|
| CO1 | Explain fundamental laws governing EM fields and evaluate the physical quantities of EM fields (field intensity, flux density, etc.) in different media using the fundamental laws. | II (UNDERSTAND) |
| CO2 | .Design storage devices using dielectrics, capacitors, inductors using laws of EM fields. | VI(CREATE) |
| CO3 | Apply principles of magneto statistics to the solutions of problems relating to the magnetic field and magnetic potential and to describe magnetic field around a moving charge. | III(APPLYING) |

| | | |
|------------|---|---------------|
| CO4 | Apply laws of EMI on devices like betatron, moving ballistic galvanometer, transformers, etc. | III(APPLYING) |
| CO5 | Analyze Electromagnetic wave propagation and importance of Maxwell's equations. | IV(ANALYZING) |

TABLE 1: CO, PO, PSO MAPPING

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|-----------------|--------------------|-----|-----|-----|-----|-----|-----|-----|---------------------------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | | | H | | | | H | S | S | | | |
| 2 | H | | | | | | H | H | S | S | | | |
| 3 | H | | | H | | | H | H | S | S | | S | |
| 4 | H | H | | H | | | H | | S | S | | S | |
| 5 | H | | H | H | | | | | S | S | | S | |

H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

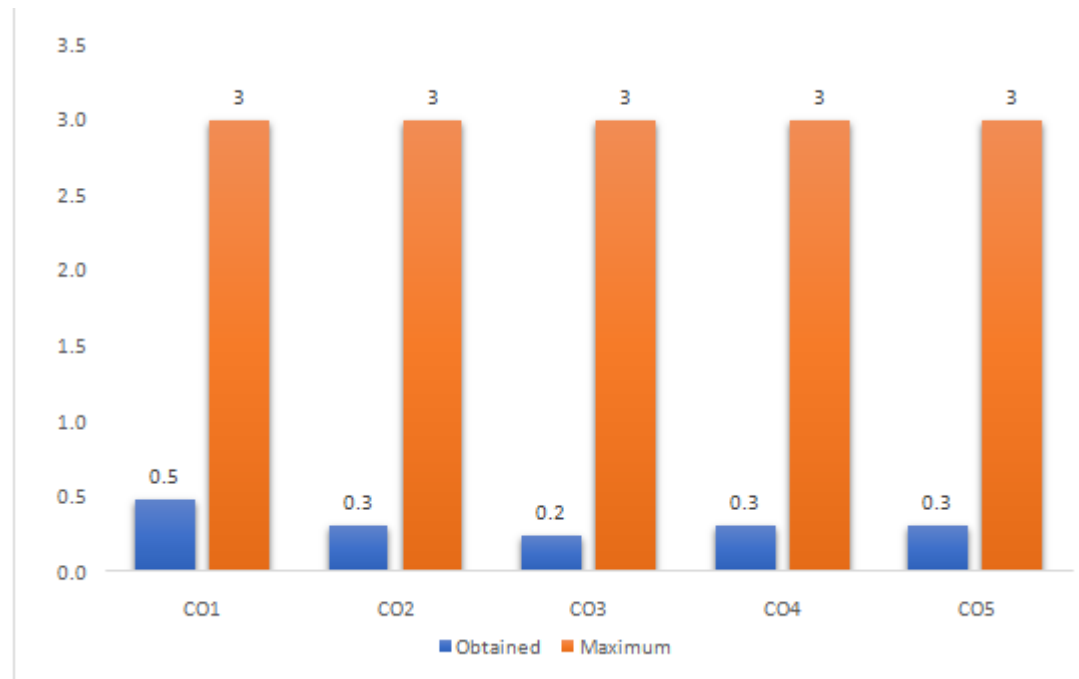
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



| co | WEEKLY TEST | | MID SEM | | PREFINAL | | ASSIGNMENT | | VIVA-VOCE | | ATTENDENCE | | External Exam | | | | |
|-----|-------------|------------------|---------|------------------|----------|------------------|------------|------------------|-----------|------------------|------------|------------------|--------------------------|-------|------------------|--------------------------|-----------------------|
| | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | pass% | Attainment level | co wise internal average | pass% | Attainment level | co wise external average | co wise total average |
| C01 | 27.1 | 0.0 | | | 25.0 | 0.0 | 100.0 | 3.0 | 100.0 | 3.0 | 43.8 | 0.0 | 1.2 | 64.6 | 0.0 | 0.0 | 0.5 |
| C02 | 27.1 | 0.0 | | | 25.0 | 0.0 | | | 100.0 | 3.0 | 43.8 | 0.0 | 0.8 | 64.6 | 0.0 | 0.0 | 0.3 |
| C03 | 27.1 | 0.0 | 27.1 | 0.0 | 25.0 | 0.0 | | | 100.0 | 3.0 | 43.8 | 0.0 | 0.6 | 64.6 | 0.0 | 0.0 | 0.2 |
| C04 | | | 27.1 | 0.0 | 25.0 | 0.0 | | | 100.0 | 3.0 | 43.8 | 0.0 | 0.8 | 64.6 | 0.0 | 0.0 | 0.3 |
| C05 | | | 27.1 | 0.0 | 25.0 | 0.0 | | | 100.0 | 3.0 | 43.8 | 0.0 | 0.8 | 64.6 | 0.0 | 0.0 | 0.3 |

Table 3: PROGRAMME OUTCOME MAPPING



| OUTCOME | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------------------|-------------|-------|-------|--------|-----|-----|--------|---------|
| CO1 | H 0.48 | | | H 0.48 | | | | H 0.48 |
| CO2 | H 0.3 | | | | | | H 0.3 | H 0.3 |
| CO3 | H 0.24 | | | H 0.24 | | | H 0.24 | H 0.24 |
| CO4 | H 0.3 | H 0.3 | | H 0.3 | | | H 0.3 | |
| CO5 | H 0.3 | | H 0.3 | H 0.3 | | | | |
| AVERAGE OF COS FOR POS | 0.324 | 0.3 | 0.3 | 0.33 | | | 0.28 | 0.34 |
| AVERAGE OF POS | 0.2928 | 0.3 | 0.3 | 0.2925 | | | 0.28 | 0.29333 |
| AVERAGE | 0.293105556 | | | | | | | |

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: ELECTRONIC DEVICES AND CIRCUITS

COURSE CODE: ET19202

CREDITS: 4

DEPARTMENT: ELECTRONICS AND COMMUNICATION TECHNOLOGY

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :

BSc.

- **PO1. Scientific Knowledge. Apply the knowledge of Science, Mathematics, Engineering&Technology fundamentals to solve the complex problems.**
- **PO2. 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.**
- **PO3.Problem analysis: Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.**
- **PO4. Modern tool usage: Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.**
- **PO5. Environment and sustainability: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.**
- **PO6.Individual and team work: Function objectively as an individual and as a member in diverse teams.**
- **PO7. Communication: Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.**
- **PO8. Life-long learning: Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.**

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

PSO 1:

Students will be able to understand the concepts and apply fundamentals of electronics in various domains of analog and digital systems.

PSO 2:

Design and analyze various functional elements of different modes of communications systems.

PSO 3:

Implement and demonstrate variety of automation systems by controlling, processing different signals according to the required specifications.

PSO 4:

Compete with the people who are using electronic hardware and software IT tools for the design and analysis of complex electronic systems in furtherance to research activities.

PSO 5:

Excellent adaptability to changing work environment, good inter personal skills as a leader in a team with good skills to communicate in both oral and written forms.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|------------|---|-------------------------------|
| CO1 | Study the crystal structure and analyze the behaviour of semiconductor material | IV (ANALYZE) |
| CO2 | Explain the various voltages across and current flow through a p-n junction with varying doping concentrations | II (UNDERSTANDING) |
| CO3 | Explain the various voltages across and current flow through any Transistor in various configurations junction with varying doping concentrations which help to realize an amplifier circuit. | II (UNDERSTANDING) |
| CO4 | Analyze various factors influencing a transistor. | IV (ANALYZE) |
| CO5 | Understand the type of semiconductor material used in power and opto-electronic devices and analyze the current flow through them. | II (UNDERSTANDING) |

TABLE 1: CO, PO, PSO MAPPING

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|-----------------|--------------------|-----|-----|-----|-----|-----|-----|-----|---------------------------|------|------|------|--|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | |
| 1 | H | H | | | | | | | S | H | | | |
| 2 | H | | S | | | | | | H | H | | | |
| 3 | S | H | | | | | | | | H | | | |
| 4 | H | | | | | | | | H | | S | | |
| 5 | H | S | | | | | | | H | S | | | |

H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

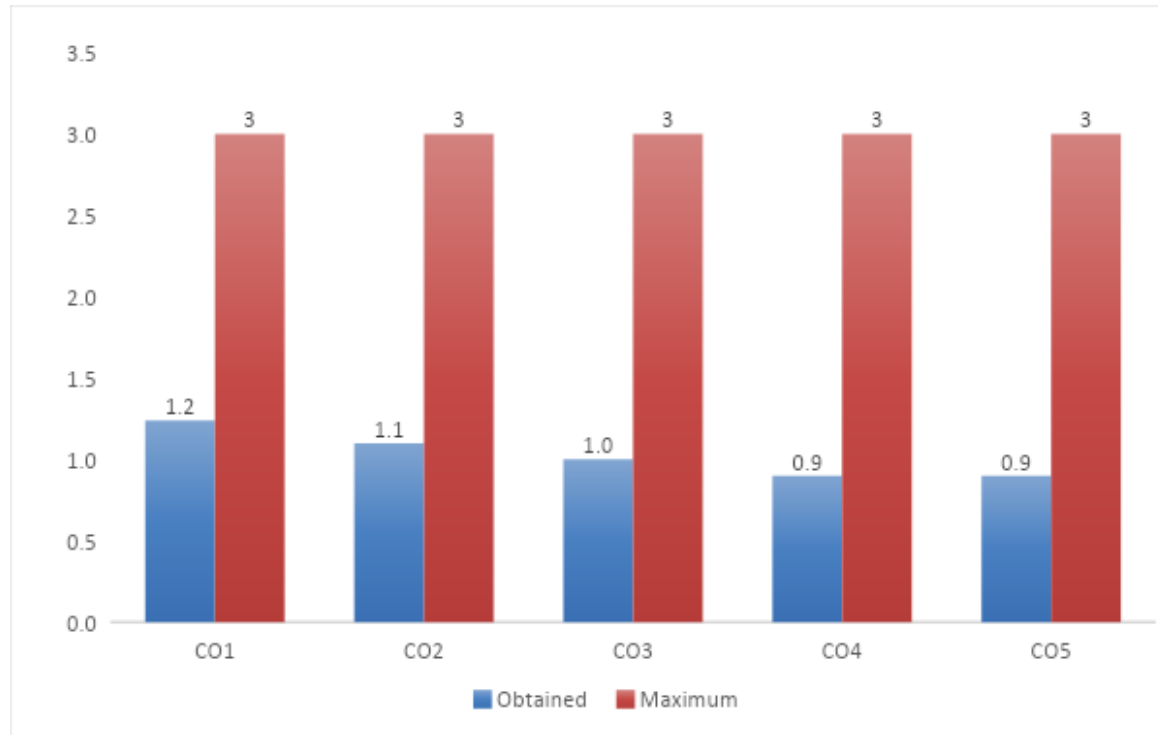
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



| | | | | | | | |
|----|-------------|---------|----------|------------|-----------|------------|---------------|
| co | WEEKLY TEST | MID SEM | PREFINAL | ASSIGNMENT | VIVA-VOCE | ATTENDENCE | External Exam |
|----|-------------|---------|----------|------------|-----------|------------|---------------|

| | pas s% | Attainm ent level | pass % | Attainm ent level | pass % | Attainm ent level | pass % | Attainm ent level | pass % | Attainm ent level | pass % | Attainm ent level | co wise intern al averag e | pass % | Attainm ent level | co wise externa l average | co wise total avera ge |
|-----|-----------|-------------------------|-----------|----------------------|-----------|----------------------|-----------|----------------------|-----------|----------------------|-----------|----------------------|---|-----------|----------------------|------------------------------------|------------------------------------|
| CO1 | 83.3 | 2.0 | | | 27.1 | 0.0 | 100. 0 | 3.0 | 100. 0 | 3.0 | 37.5 | 0.0 | 1.6 | 68.8 | 1.0 | 1.0 | 1.2 |
| CO2 | 83.3 | 2.0 | | | 27.1 | 0.0 | | | 100. 0 | 3.0 | 37.5 | 0.0 | 1.3 | 68.8 | 1.0 | 1.0 | 1.1 |
| CO3 | 83.3 | 2.0 | 33.3 | 0.0 | 27.1 | 0.0 | | | 100. 0 | 3.0 | 37.5 | 0.0 | 1.0 | 68.8 | 1.0 | 1.0 | 1.0 |
| CO4 | | | 33.3 | 0.0 | 27.1 | 0.0 | | | 100. 0 | 3.0 | 37.5 | 0.0 | 0.8 | 68.8 | 1.0 | 1.0 | 0.9 |
| CO5 | | | 33.3 | 0.0 | 27.1 | 0.0 | | | 100. 0 | 3.0 | 37.5 | 0.0 | 0.8 | 68.8 | 1.0 | 1.0 | 0.9 |

| AVERAGE | AVERAGE |
|---------|---------|
| 1 | 1.028 |

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

Mid Semester and pre final exams are the areas where students need to practice circuit diagrams and derivations.

Table 3: PROGRAMME OUTCOME MAPPING

| OUTCOME | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------------------|-------------|-----|------------|-------|-----|-----|-------|-------|
| CO1 | H 1.24 | | H 1.24 | | | | | |
| CO2 | H 1.1 | | H 1.1 | H 1.1 | | | H 1.1 | |
| CO3 | H 1 | | H 1 | H 1 | H 1 | | H 1 | |
| CO4 | H 0.9 | | H 0.9 | H 0.9 | | | H 0.9 | |
| CO5 | H 0.9 | | H 0.9 | H 0.9 | | | | H 0.9 |
| AVERAGE OF COS FOR POS | 1.028 | | 1.028 | 0.975 | 1 | | 1 | 0.9 |
| AVERAGE OF POS | 0.985 6 | | 0.985 6 | 0.975 | 1 | | 1 | 0.9 |
| AVERAGE | 0.974366667 | | | | | | | |

Instruction:

- 1. Copy the completed table 1.**
- 2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points.]**
- 3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.**

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: ELECTRONIC INSTRUMENTATION

COURSE CODE: ET20404

CREDITS: 4

DEPARTMENT: ELECTRONICS AND COMMUNICATION TECHNOLOGY

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :

BSc.

- **PO1. Scientific Knowledge. Apply the knowledge of Science, Mathematics, Engineering&Technology fundamentals to solve the complex problems.**
- **PO2. 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.**
- **PO3.Problem analysis: Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.**
- **PO4. Modern tool usage: Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.**
- **PO5. Environment and sustainability: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.**
- **PO6.Individual and team work: Function objectively as an individual and as a member in diverse teams.**
- **PO7. Communication: Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.**
- **PO8. Life-long learning: Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.**

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

PSO 1:

Students will be able to understand the concepts and apply fundamentals of electronics in various domains of analog and digital systems.

PSO 2:

Design and analyze various functional elements of different modes of communications systems.

PSO 3:

Implement and demonstrate variety of automation systems by controlling, processing different signals according to the required specifications.

PSO 4:

Compete with the people who are using electronic hardware and software IT tools for the design and analysis of complex electronic systems in furtherance to research activities.

PSO 5:

Excellent adaptability to changing work environment, good inter personal skills as a leader in a team with good skills to communicate in both oral and written forms.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|------------|---|-------------------------------|
| CO1 | Summarize the evolution and history of units and standards in Measurements. | II (UNDERSTAND) |
| CO2 | Identify the various parameters that are measurable in electronic instrumentation. | III (APPLYING) |
| CO3 | Employ appropriate instruments to measure given sets of parameters. | VI(EVALUATING) |
| CO4 | Practice the construction of testing and measuring set up for electronic systems. | VI (CREATE) |
| CO5 | To have a deep understanding about instrumentation concepts this can be applied to Control systems. | III (APPLYING) |

TABLE 1: CO, PO, PSO MAPPING

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|-----------------|--------------------|-----|-----|-----|-----|-----|-----|-----|---------------------------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | | S | S | | | | | H | H | | | S |
| 2 | H | H | H | | | S | S | H | H | | S | | S |
| 3 | H | H | H | S | | H | | S | | H | | | S |
| 4 | H | | | | | | | H | H | | H | | S |
| 5 | | H | S | | | | | | | H | | | |

H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

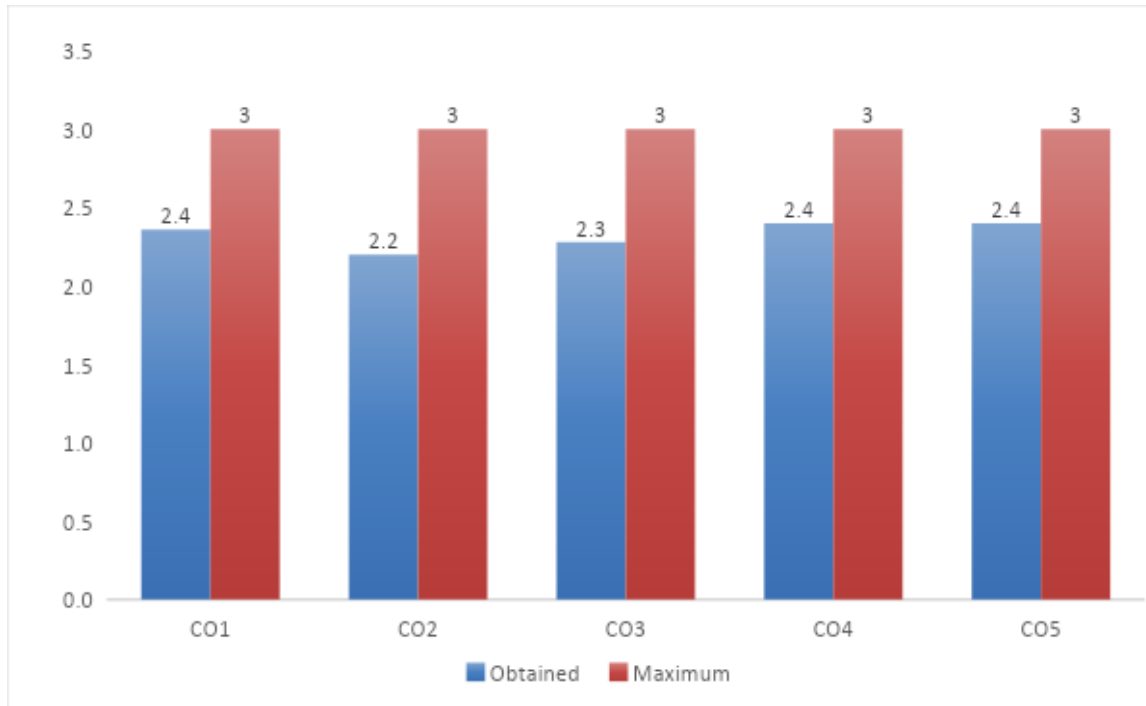
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



| | | | | | | | |
|----|-------------|---------|----------|------------|-----------|------------|---------------|
| co | WEEKLY TEST | MID SEM | PREFINAL | ASSIGNMENT | VIVA-VOCE | ATTENDENCE | External Exam |
|----|-------------|---------|----------|------------|-----------|------------|---------------|

| | pass % | Attainment level | pass % | Attainment level | pass % | Attainment level | pass % | Attainment level | pass % | Attainment level | pass % | Attainment level | co wise internal average | pass % | Attainment level | co wise external average | co wise total average |
|-----|--------|------------------|--------|------------------|--------|------------------|--------|------------------|--------|------------------|--------|------------------|--------------------------|--------|------------------|--------------------------|-----------------------|
| CO1 | 56.0 | 0.0 | | | 74.0 | 1.0 | 100.0 | 3.0 | 100.0 | 3.0 | 22.0 | 0.0 | 1.4 | 88.0 | 3.0 | 3.0 | 2.4 |
| CO2 | 56.0 | 0.0 | | | 74.0 | 1.0 | | | 100.0 | 3.0 | 22.0 | 0.0 | 1.0 | 88.0 | 3.0 | 3.0 | 2.2 |
| CO3 | 56.0 | 0.0 | 78.0 | 2.0 | 74.0 | 1.0 | | | 100.0 | 3.0 | 22.0 | 0.0 | 1.2 | 88.0 | 3.0 | 3.0 | 2.3 |
| CO4 | | | 78.0 | 2.0 | 74.0 | 1.0 | | | 100.0 | 3.0 | 22.0 | 0.0 | 1.5 | 88.0 | 3.0 | 3.0 | 2.4 |
| CO5 | | | 78.0 | 2.0 | 74.0 | 1.0 | | | 100.0 | 3.0 | 22.0 | 0.0 | 1.5 | 88.0 | 3.0 | 3.0 | 2.4 |

| AVERAGE | AVERAGE |
|---------|---------|
| 3 | 2.328 |

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory.

Performance in mid Semester exam needs to be improved to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

| OUTCOME | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------------------|-------------|-----|------------|--------|--------|-----|------------------|-------|
| CO1 | H 2.36 | | H 2.36 | | | | | |
| CO2 | H 2.2 | | H 2.2 | H 2.2 | | | H 2.2 | |
| CO3 | H 2.28 | | H 2.28 | H 2.28 | H 2.28 | | H 2.28 | |
| CO4 | H 2.4 | | H 2.4 | H 2.4 | | | H 2.4 | |
| CO5 | H 2.4 | | H 2.4 | H 2.4 | | | | H 2.4 |
| AVERAGE OF COS FOR POS | 2.328 | | 2.328 | 2.32 | 2.28 | | 2.293333333 | 2.4 |
| AVERAGE OF POS | 2.321 6 | | 2.321 6 | 2.32 | 2.28 | | 2.293333333 3 | 2.4 |
| AVERAGE | 2.322755556 | | | | | | | |

Instruction:

- 1. Copy the completed table 1.**
- 2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points].**
- 3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.**

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: OPTICAL FIBER COMMUNICATION

COURSE CODE: ET21606A

CREDITS: 4

DEPARTMENT: ELECTRONICS AND COMMUNICATION TECHNOLOGY

PROGRAMME OUTCOMES (BA/BSC/BCOM and BBA) OrPOs:

BSc.

- **PO1. Scientific Knowledge. Apply the knowledge of Science, Mathematics, Engineering&Technology fundamentals to solve the complex problems.**
- **PO2. 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.**
- **PO3.Problem analysis: Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.**
- **PO4. Modern tool usage: Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.**
- **PO5. Environment and sustainability: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.**
- **PO6.Individual and team work: Function objectively as an individual and as a member in diverse teams.**
- **PO7. Communication: Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.**
- **PO8. Life-long learning: Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.**

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

PSO 1:

Students will be able to understand the concepts and apply fundamentals of electronics in various domains of analogue and digital systems.

PSO 2:

Design and analyze various functional elements of different modes of communications systems.

PSO 3:

Implement and demonstrate variety of automation systems by controlling, processing different signals according to the required specifications.

PSO 4:

Compete with the people who are using electronic hardware and software IT tools for the design and analysis of complex electronic systems in furtherance to research activities.

PSO 5:

Excellent adaptability to changing work environment, good inter personal skills as a leader in a team with good skills to communicate in both oral and written forms.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|------------|--|-------------------------------|
| CO1 | Recognize and classify the structures of Optical fiber and types | II (UNDERSTANDING) |
| CO2 | Discuss the channel impairments like losses and dispersion. | VI (CREATING) |
| CO3 | Analyze various coupling losses. | IV (ANALYZING) |
| CO4 | Classify the Optical sources and detectors and to discuss their principle. | II (UNDERSTANDING) |
| CO5 | Understand the methods employed in passing the data information in the optical form. | II (UNDERSTANDING) |

TABLE 1: CO, PO, PSO MAPPING

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|-----------------|--------------------|-----|-----|-----|-----|-----|-----|-----|---------------------------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | S | H | H | H | H | | H | H | H | | H | S |
| 2 | H | S | H | S | H | | H | H | H | | S | | S |
| 3 | H | H | H | S | | H | | S | H | H | H | H | S |
| 4 | H | S | S | | | H | S | H | H | S | H | S | |
| 5 | H | | H | S | S | H | | S | H | S | H | S | |

H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

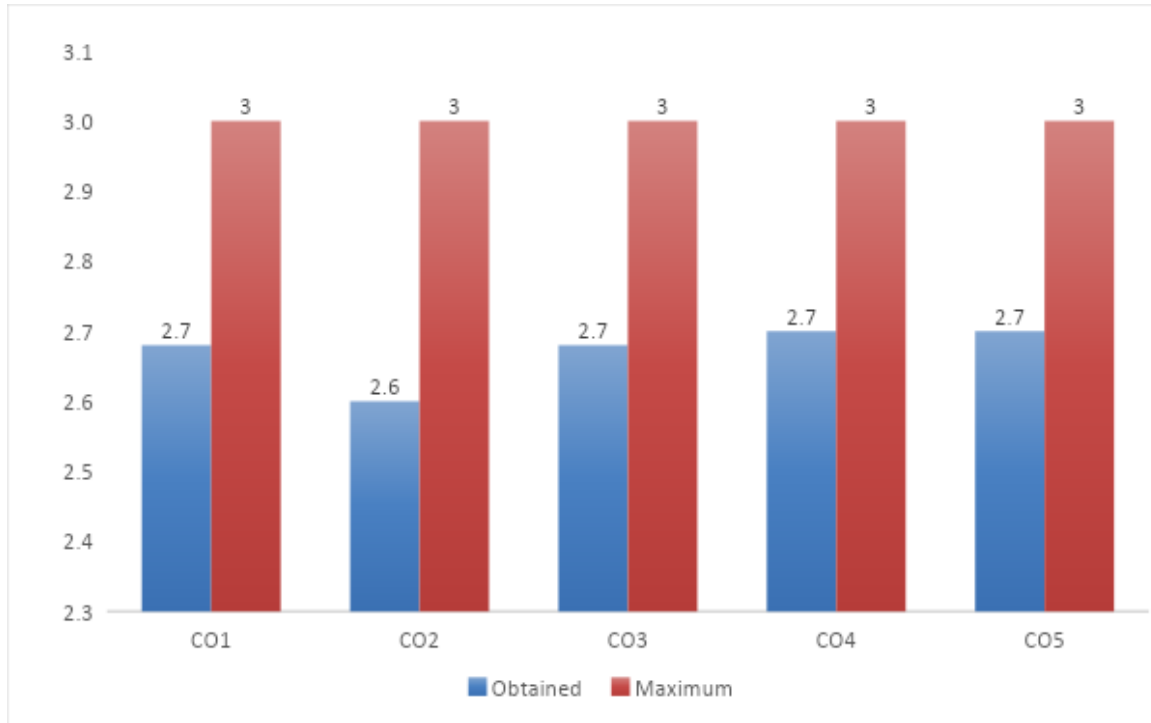
ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75% - 85%= 2

Pass percent between 65%- 75%= 1

Pass percent of less than 65%= 0



| co | WEEKLY TEST | | MID SEM | | PREFINAL | | ASSIGNMENT | | VIVA-VOCE | | ATTENDANCE | | External Exam | | | | |
|-----|-------------|------------------|---------|------------------|----------|------------------|------------|------------------|-----------|------------------|------------|------------------|--------------------------|--------|------------------|--------------------------|-----------------------|
| | pass % | Attainment level | pass % | Attainment level | pass % | Attainment level | pass % | Attainment level | pass % | Attainment level | pass % | Attainment level | co wise internal average | pass % | Attainment level | co wise external average | co wise total average |
| CO1 | 79.2 | 2.0 | | | 100.0 | 3.0 | 100.0 | 3.0 | 100.0 | 3.0 | 33.3 | 0.0 | 2.2 | 100.0 | 3.0 | 3.0 | 2.7 |
| CO2 | 79.2 | 2.0 | | | 100.0 | 3.0 | | | 100.0 | 3.0 | 33.3 | 0.0 | 2.0 | 100.0 | 3.0 | 3.0 | 2.6 |
| CO3 | 79.2 | 2.0 | 100.0 | 3.0 | 100.0 | 3.0 | | | 100.0 | 3.0 | 33.3 | 0.0 | 2.2 | 100.0 | 3.0 | 3.0 | 2.7 |
| CO4 | | | 100.0 | 3.0 | 100.0 | 3.0 | | | 100.0 | 3.0 | 33.3 | 0.0 | 2.3 | 100.0 | 3.0 | 3.0 | 2.7 |
| CO5 | | | 100.0 | 3.0 | 100.0 | 3.0 | | | 100.0 | 3.0 | 33.3 | 0.0 | 2.3 | 100.0 | 3.0 | 3.0 | 2.7 |

| AVERAGE | AVERAGE |
|---------|---------|
| 3 | 2.672 |

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory.

Performance in mid Semester exam needs to be improved to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

| OUTCOME | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------------------|-------------|--------|-------------|--------|--------|------------|-------|--------------|
| CO1 | H 2.68 | | H 2.68 | H 2.68 | H 2.68 | H 2.68 | | H 2.68 |
| CO2 | H 2.6 | | H 2.6 | | H 2.6 | | H 2.6 | H 2.6 |
| CO3 | H 2.68 | H 2.68 | H 2.68 | | | H 2.68 | | |
| CO4 | H 2.7 | | | | | H 2.7 | | H 2.7 |
| CO5 | H 2.7 | | H 2.7 | | | H 2.7 | | |
| AVERAGE OF COS FOR POS | 2.672 | 2.68 | 2.665 | 2.68 | 2.64 | 2.69 | 2.6 | 2.66 |
| AVERAGE OF POS | 2.670 4 | 2.68 | 2.6612 5 | 2.68 | 2.62 | 2.692 5 | 2.6 | 2.65333 3 |
| AVERAGE | 2.657185417 | | | | | | | |

Instruction:

- 1. Copy the completed table 1.**
- 2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]**
- 3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.**