



# RAJEEV GANDHI MEMORIAL

COLLEGE OF ENGINEERING AND TECHNOLOGY (A)  
Nandyal-518501, Kurnool DT., Andhra Pradesh. [www.rgmcet.edu.in](http://www.rgmcet.edu.in)

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## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

*Welcomes*  
*Expert Members from NBA*

Presentation by  
**Dr. Kethepalli Mallikarjuna**  
Prof. & Head of the Department, ECE

# *Presentation Outline*

<b>Department</b>	<ul style="list-style-type: none"><li>• Introduction</li></ul>
<b>Department</b>	<ul style="list-style-type: none"><li>• Achievements/Recognitions</li></ul>
<b>Criterion-1</b>	<ul style="list-style-type: none"><li>• Vision, Mission and Program Educational Objectives</li></ul>
<b>Criterion-2</b>	<ul style="list-style-type: none"><li>• Program Curriculum and Teaching – Learning Processes</li></ul>
<b>Criterion-3</b>	<ul style="list-style-type: none"><li>• Program Outcomes and Course Outcomes</li></ul>
<b>Criterion-4</b>	<ul style="list-style-type: none"><li>• Students' Performance</li></ul>
<b>Criterion-5</b>	<ul style="list-style-type: none"><li>• Faculty Information and Contributions</li></ul>
<b>Criterion-6</b>	<ul style="list-style-type: none"><li>• Facilities and Technical Support – Teaching &amp; Special Labs</li></ul>
<b>Criterion-7</b>	<ul style="list-style-type: none"><li>• Continuous Improvement</li></ul>
<b>Outcome Based Education (OBE)</b>	<ul style="list-style-type: none"><li>• OBE Philosophy of the Department</li></ul>



# Part-I

## Introduction – Department Profile

- Year of Establishment: 1995
- Names of Programmes / Courses offered

S.No.	Course Name	Programme Name	Year of Start
1	UG(B.Tech)	Electronics and Communication Engineering	1995
2	PG(M.Tech)	1.Digital Systems and Computer Electronics(DSCE) 2.Embedded Systems(ES)	2004
3.	Ph.D	Full time Doctoral Degree	2015

### **B.TECH (ECE)**

- Started in 1995 with an intake of 60
- Intake increased to 90 in the A-Y 2000-2001
- Intake increased to 120 in the A-Y 2002-2003
- Intake increased to 180 in the A-Y 2011-2012
- Intake increased to 240 in the A-Y 2015-2016

### **M.TECH (DSCE) and M.TECH (ES)**

- Both started in 2004 with an intake of 18

# Department Level-Achievement:

- RGM-R-2019 is revised as per the AICTE Guidelines without exemption of credits, it also introduced Mandatory learning courses and internships. HONORs introduced from this regulations.
- RGM-R-2020 -The curriculum and syllabus is designed in tune with the guidelines of AICTE and APSCHE and introduced more Skill Development Programs, MOOCs, Mandatory Learning subjects, apart from mandatory Internships for all the students. IV year second semester is completely dedicated for project work only.
- RGM-R-2023 as per JNTUA and APSCHE guidelines incorporated with HONORS and MINOR degrees. Internships(CSP, Research Internship and Industry Internships) and enhanced with electives from verticals provided in guide lines. NEP-2020 with multiple exits are initiated.
- *Dedicated and High qualified faculty including **15 doctorates** from prestigious Institutions with **639** journals (**96** SCI/SCIE/ESCI and **98** Scopus and **445** others).*
- *Department is having **well equipped labs** with a worth of **Rs.3.32 crores**.*
- *Department has a credit **Rs.1.02 crores of sanctioned funds** : DST-FIST (60 Lakhs), SERB/DST(39.6 Lakhs), UGC Project ( 2.5 Lakhs).*
- *Achieved **placements** of 141 for 2022-23, 214 in 2021-22, 130 in 2020-21 and 132 in 2019-2020.*
- ***NBA-AICTE** accreditation five times i.e.; in the years 2003, 2007, 2013, 2017 and 2020.*
- Accredited by **NAAC** in two cycles with 'A' Grade in the year 2012 (with CGPA of 3.34 on 4 points scale) and A+ in the year 2017(with CGPA of 3.54 on 4 point scale).
- **NIRF Ranking** 251-300 band in 2020 and 201-250 band in 2021.

## Faculty Level-Achievement:

### Awards

- ❑ Dr.T.Jayachandra Prasad received “Best Principal Award” twice from ISTE and JNTUA.
- ❑ Dr.P.V.Gopi Krishna Rao received “Uthama Acharya Puraskar”, “Best Supervisor” & “Elite Faculty Member”
- ❑ Dr.J.Sofia Priyadarshini received “Uthama Acharya Puraskar”.

### Recognitions

- Faculty are serving as reviewers, editorial board members of various peer reviewed journals.
- Faculty are members of selection committee and BoS of other Institutes.
- Dr. D. Satya Narayana got Texas instruments certificate of appreciation and NPTEL-Certification of appreciation.
- Dr. N. Ramanjaneyulu got several applauds from NPTEL/SWAYAM/MOOCs namely NPTEL-Enthusiast, NPTEL-Believer, NPTEL-Discipline Star, NPTEL-Domain Star.

## Student Level-Achievement:

- **APSCHE influential student award** is presented to **Patil Sai Abin** of IV-year by APSCHE, Govt. of AP for the year 2022.
- Students Presented their Agriculture innovation **“DARSANIYA KRISHI YANTRA”** to central agricultural minister Sri Narendra Kumar Tomar at NIRDPR, Hyderabad and to officials of **NABARD** for funding.
- Department of ECE is proud to announce that the students have participated in finals of **SMART INDIA HACKATHON-2018, 2019, 2021, 2022.**
- **AICTE Chatra Viswakarma Awards - 2020**
- **Srishti - 2020** National Students’ Innovation Challenge and Won Best Robotics Project and Best Innovation Project awards and cash prize of Rs 35,000/- .
- They stood first in achieving District and State level Champion ship in **TECH FEST** organized by JNTUA, Anantapuramu, GPREC, Kurnool, SVR Engg. College, Nandyal.
- The Department **has established student chapters of IE(I), ISTE, IEEE and IoT maker space & Ideation centre** to motivate the student community to organize events such as Paper Presentations, Guest lectures, Group Discussions etc.
- 5 students got more than 9.5 CGPA and received cash prize of Rs.25000/- from the management.

# Criteria 1-Vision, Mission & PEOs

## Vision

- To become a center of excellence in academics and research in Electronics and communication engineering to meet the present and future needs of society with human face.

## Mission

- To educate the students in latest technologies to achieve best standards in theoretical and practical aspects.
- To have a strong collaboration with electronics industry.
- To develop indigenous and appropriate technologies at low cost to help the rural people.

## Criteria 1-Vision, Mission & PEOs contd...

### Programmable Educational Objectives

**PEO-1:** To train competent Electronics & Communication Engineers in analysis, design and testing of electronics systems by providing modern tools.

**PEO-2:** To prepare graduates to take up gainful employment in core sector and prepare them for a successful career in Multinational companies.

**PEO-3:** To impart skills to develop affordable products for rural people by adopting multidisciplinary approach.

**PEO-4:** To undertake sponsored projects, consultancy and internships by strengthening industry institute collaboration.

### Consistency of PEOs with Mission of the Department

**M1-** To educate the students in latest technologies to achieve best standards in theoretical and practical aspects.

**M2** -To have a strong collaboration with electronics industry

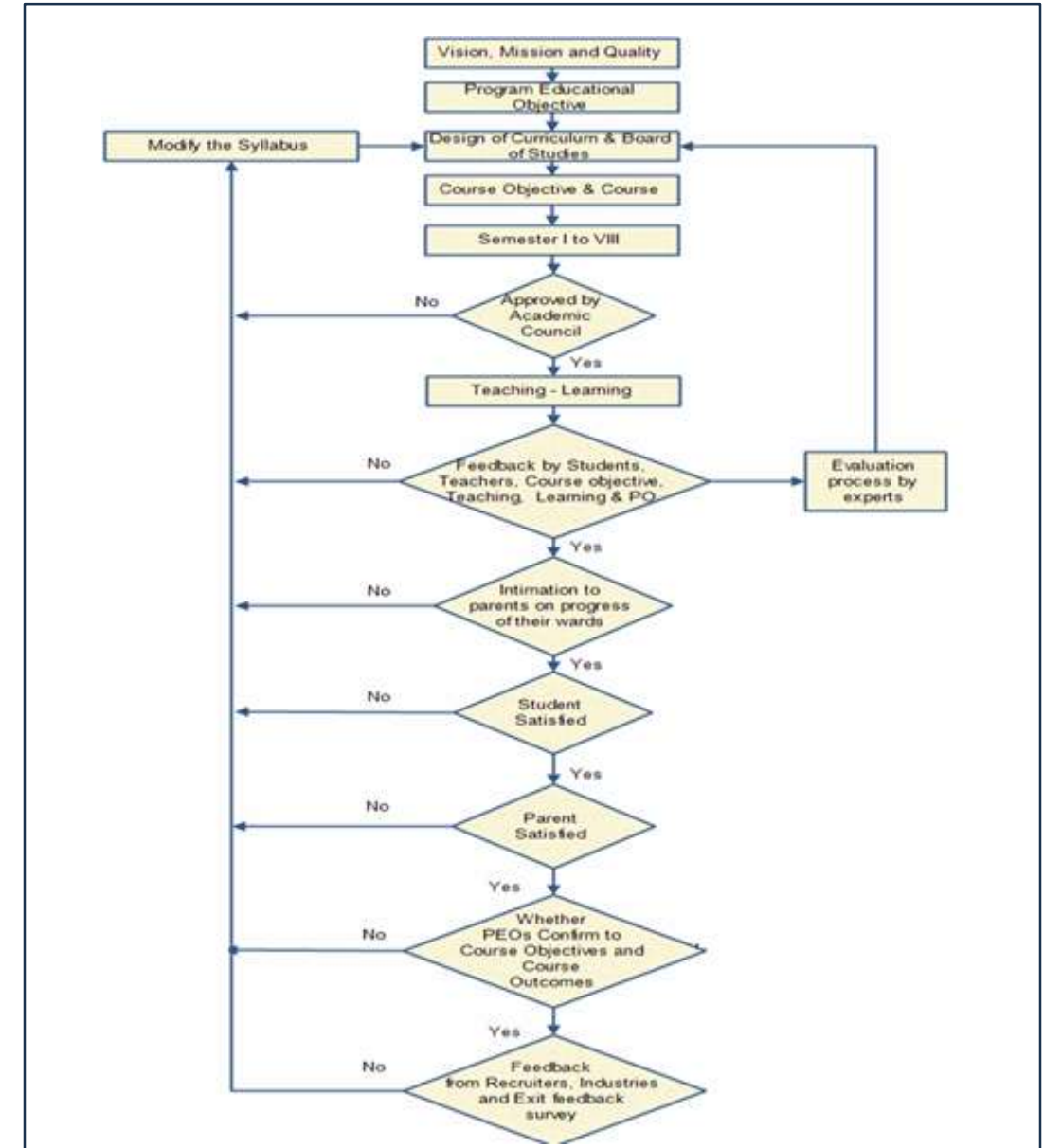
**M3-** To develop indigenous and appropriate technologies at low cost to help the rural



# Criteria 2- Program Curriculum and Teaching Learning Process

## Program Curriculum

- During **CAY (2022-23)** I-B.Tech comes under the regulations of R20.
- II and III-B.Tech follows R20 and IV-B.Tech come under the regulations of R19.
- Structure of curriculum reflects as per the corresponding regulations.
- Regulations: RGM-R-2010 (240 credits), RGM-R-2012 (198 credits), RGM-R-2015 (200 credits), RGM-R-2019 (160 credits) & RGM-R-20 (160 credits)
- RGM-R-20 -The curriculum and syllabus is designed in tune with the guidelines of AICTE and APSCHE and introduced more Skill Development Programs, MOOCs, Mandatory Learning subjects, apart from Mandatory internships for all the students. IV year second semester is completely dedicated for project work only.
- Choice Based Credit System (CBCS) has been introduced in RGM-R15 by incorporating credit system for the program, concepts of Massive On-line Open Course (MOOCs), offering Minor degree, HONORs offered in R19 regulations.

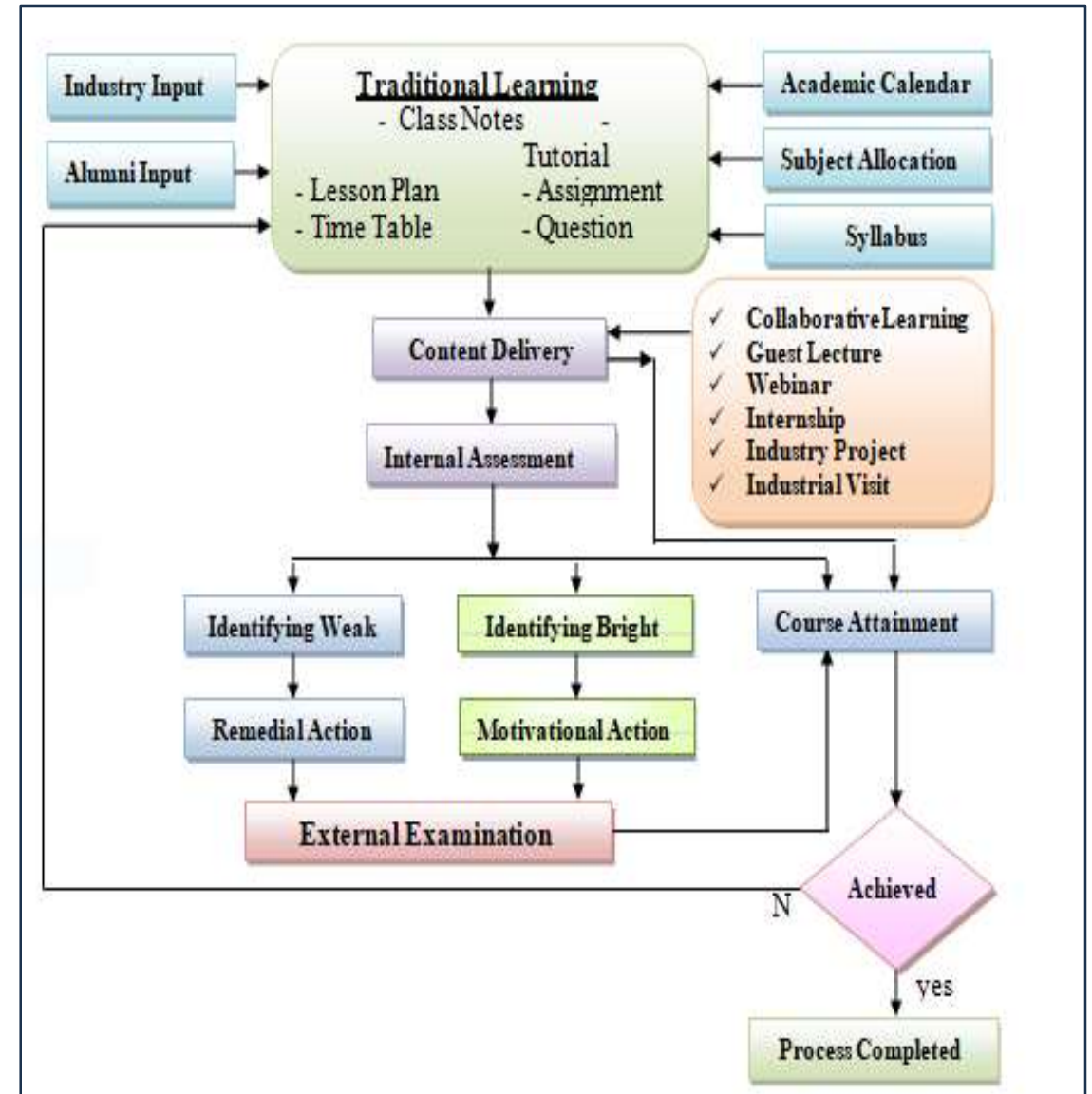


Process of Designing curriculum

## Criteria 2- Program Curriculum and Teaching Learning Process contd...

### Teaching Learning Process

- First day of student starts with the orientation program of welcoming by the institution and department and Induction program.
- The academic calendar provides dates of commencement of the academic session, duration of semester, dates of Internals, final semester examinations etc.
- The Lesson plan is prepared by the individual faculty member under the guidance and resolutions of faculty members who taught earlier for the respective courses.
- Course file includes lesson plans, teaching aids such as subject notes, presentation files and their respective COs and POs.
- Adequate equipment in laboratories supports the students to enrich in more practical environment in duration of their graduation, usage of equipment is recorded in log registers.
- Seminars, Library and Student Counseling hours are incorporated in the time table in order to improve the student's presenting skills, improving of knowledge by spending time in Library and to discuss the issues personally.



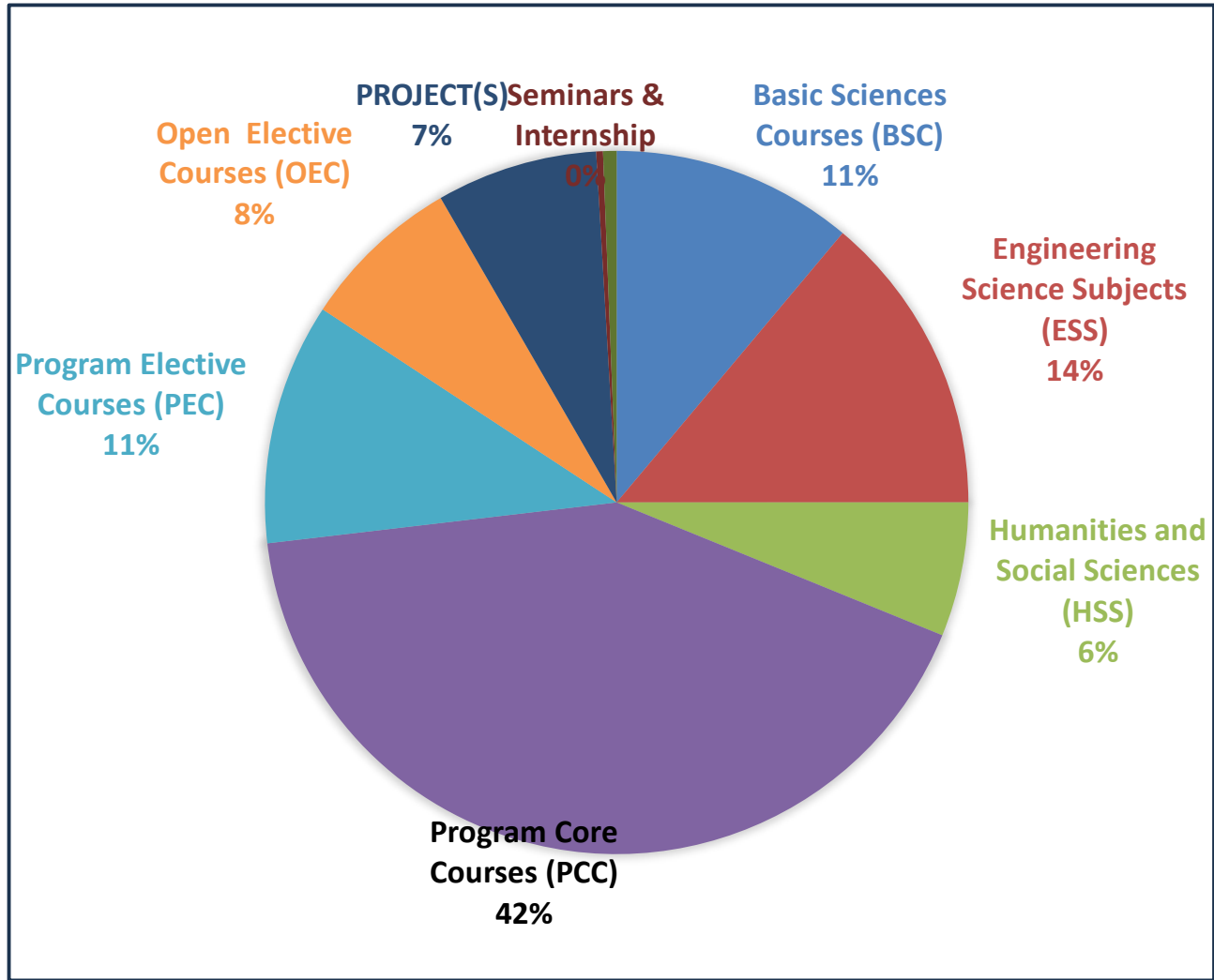
## Criteria 2- Program Curriculum and Teaching Learning Process contd...

### Process for Teaching – Learning Processes

- Department has made parents of students as the stake holders by sending SMS about the absence of the individual student daily and monthly report. Student assessment in internals and end exams are also informed to parents.
- Student mentors are allotted for a group of 15-20 students so that keen observation can be maintained.
- Outstanding students who secured 90% and above marks are rewarded with cash prize.
- Remedial classes are arranged for the academically weak students beyond the working hours.
- Student feedback is considered in every semester after commencement of class work and the resolutions are incorporated.
- Evaluation of Assignments are made part of finalizing the internal marks Seminars, conferences, workshops, visiting faculty lectures etc. are arranged in regular intervals by various academicians and subject experts.
- Furthermore, individual teachers are given freedom to conduct assessment tests.
- Project Expo is organized in the campus, which demonstrates all the project models of the students.
- Fare well function will end up the graduation by exchanging the ideas and feedback of the final years with juniors.
- Alumni details and regular interaction is maintained in the department office so as to arrange alumni meet further.

# Curriculum Components & Composition (2022-23)

\* R-19(Final year) & R-20(2<sup>nd</sup> and 3<sup>rd</sup> years)



Course Types	No of Credits	% of Credits
Basic Sciences Courses (BSC)	18	11.11
Engineering Science Subjects (ESS)	22.5	13.89
Humanities and Social Sciences (HSS)	10	06.17
Program Core Courses (PCC)	68	41.98
Program Elective Courses (PEC)	18	11.11
Open Elective Courses (OEC)	12	07.41
PROJECT(S)	12	07.41
Seminars & Internship	0.5	0.31
Comprehensive Viva	1	0.62
<b>TOTAL</b>	<b>* 162</b>	<b>100</b>

# Criteria 3- Program Outcomes and Course Outcomes

**Program Specific outcomes are designed to enrich the students at the end of program:**

**PSO – I:** Students are able to analyze and design the electronic circuits with the knowledge of courses related circuits, Networks, Linear digital circuits and Analog electronics.

**PSO-II:** Student can explore the scientific theories, ideas, methodologies in operation and maintenance of communication systems to bridge the gap between academics and industries.

**PSO-III:** Students are able to work professionally with new cutting edge technologies in the fields of electronic design, communication and automation.

Course	Course Outcome Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
<b>MICROWAVE ENGINEERING AND OPTICAL COMMUNICATIONS (C401)</b> (IV-B.Tech-I-Sem (R19))	Apply the knowledge of mathematics for analyzing the propagation of different microwaves in different transmission lines.	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Analyze the working principles of different wave guide components using S-parameters.	0	3	2	0	0	0	0	0	0	0	0	0	1	2	0
	Study the performance of specialized microwave tubes such as klystron, reflex klystron, magnetron, travelling wave tube and different solid-state devices.	0	2	0	1	0	0	0	0	0	0	0	0	0	1	0
	Attain the knowledge of basic optical fiber communication systems and learn the latest trends in optical communications.	2	2	1	0	0	0	0	0	0	0	0	0	1	0	2
	Recognize and classify the structures, types and channel impairments	1	3	2	0	0	0	0	0	0	0	0	0	2	1	0
	Derive the various dispersion losses in optical fibers.	2	1	3	0	0	0	0	0	0	0	0	0	1	2	0
<b>Average P.O</b>		<b>1.75</b>	<b>2.2</b>	<b>1.8</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1.25</b>	<b>1.5</b>	<b>2</b>

## Criteria 3- Program Outcomes and Course Outcomes contd...

### Program Articulation Matrix:

Set PO's of the Program (Department of the Electronics and Communication Engineering) Program core courses of each semester (at least one) are considered for mapping of Program Outcomes.

Table 3.1 Program Articulation Matrix

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Electronic Devices and Circuits (II B. Tech I sem)	2.00	2.33	3.00	-	-	-	-	-	-	-	-	-	1.75	2.00	1.00
ARM Microcontroller & its Interfacing (II B. Tech II sem)	3	2.6	2.8	2	-	2	2.00	2.00	2.00	2.00	2.00	1.80	1	1.16	1.5
Electromagnetic Fields and Transmission Lines (II B. Tech II sem)	2	2	1.66	3	-	-	-	-	-	-	-	-	3	1.5	3
Analog Communication (III B. Tech I sem)	2.50	2.75	2.25	2.00	-	-	-	-	-	-	-	-	1.50	2.00	2.00
Antennas and Wave Propagation (III B. Tech I sem)	2	2.5	2	1.33	1.25	1	-	-	1.66	1.33	1	2	2	3	2.5
VLSI Design (III B. Tech II sem)	2	1.66	3	-	-	3	2	-	-	-	2	3	2	1	2
Digital Design using Verilog (III B. Tech II sem)	1.66	2.2	2.25	-	-	-	-	-	-	-	-	1.75	1.33	1.33	1.33
Digital Communication Lab (III B. Tech II sem)	2	2.5	2	1.33	1.66	1	-	-	1.66	1.33	1	2	3	1.25	3
Microwave and Optical Communication Lab (III B. Tech II sem)	2	1.75	2.25	-	-	-	-	-	-	-	-	-	2.5	1.5	1.5
Digital Signal Processing Lab (III B. Tech II sem)	2	1.6	1.8	-	2	-	-	-	-	1	-	1	1.66	-	1
Digital Image Processing (IV B. Tech I sem)	2.20	2.80	1.00	-	-	-	-	-	-	-	-	1.80	1.50	1.50	1.50
Satellite Communication (IV B. Tech II sem)	3.00	2.00	3.00	1.00	3.00	1.00	1.00	-	-	2.50	1.00	2.00	2.00	1.50	1.50
<b>Average of SET PO</b>	<b>2.19</b>	<b>2.22</b>	<b>2.25</b>	<b>1.77</b>	<b>1.97</b>	<b>1.6</b>	<b>1.66</b>	<b>2.00</b>	<b>1.77</b>	<b>1.63</b>	<b>1.4</b>	<b>1.91</b>	<b>1.93</b>	<b>1.61</b>	<b>1.81</b>

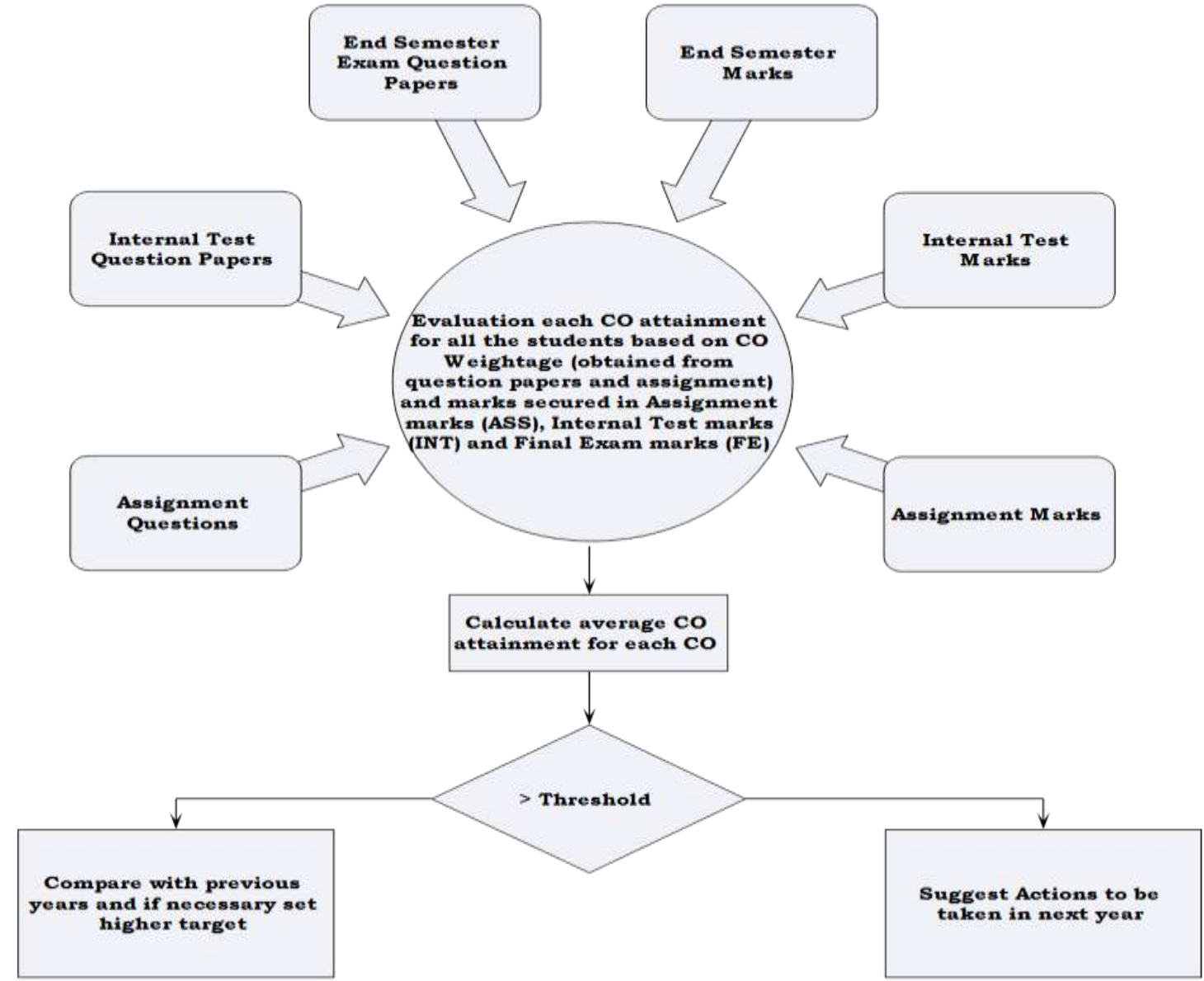
# Criteria 3- Program Outcomes and Course Outcomes contd...

## Course Articulation Matrix

Table 3.2 Course Articulation Matrix

Course	Course Outcome Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>ELECTRONIC DEVICES AND CIRCUITS (C201)</b> <u>II-B.Tech-I-sem (R20)</u>	Understand and analyze the principle of operation and equivalent electrical model for semiconductor devices like PN diode, Zener diode.	3	2										1	2	2	
	Apply the property of junction diode in rectifiers and regulators.	1	3										1	2	3	
	Understand and analyse the principle of operation and equivalent electrical model for semiconductor devices like BJT	2		3									1	1	2	1
	Understand and analyse the principle of operation and equivalent electrical model for field effect transistors: JFET, MOSFET		2	3									1	2	1	
	Obtain the Q point for various biasing techniques for BJT.	3	2	2	2								2	1	2	2
	Obtain the Q point for various biasing techniques for JFET, MOSFET.	3	2	2	2								2	2	1	1
<b>SIGNALS AND SYSTEMS (C202)</b> <u>II-B.Tech-I-sem (R20)</u>	Classify the continuous and discrete time signals & systems and understand the sampling theorem.	3	1	2	0								1	0		
	Analyze the continuous time signals using Fourier analysis.	2	3	2	0								1	1	2	
	Analyze the discrete time sequences using DTFT	1	2	1	1								1	0	1	
	Understand the Concept of convolution, correlation are useful for analysis in the areas of linear systems and communication theory.	2	2	1	0								1	1	1	1
	Apply the different transforms to analyze the continuous and discrete time signals.	1	2	2	1								1	2	1	1
<b>LINEAR AND DIGITAL IC APPLICATIONS (C301)</b> <u>III B.Tech, I-Sem (R20)</u>	Understand the Characteristics of analog ICs, digital ICs and basics of CMOS logic	1												2	1	
	Understanding of application of ICs Analysis of analog and digital circuits using ICs.	1	1	1										2	1	
	Analysis of analog and digital circuits using ICs.	2	3	2		1							1	3	2	1
	Implement efficient techniques at circuit level for designing the circuits.	2	3	3		1							1	3	2	1
	Understand the designing concepts of basic circuits using Ics	3	3	2		1							1	3	3	2
	Implementation of complex circuits using analog ICs and digital Ics	3	3	3		1							1	3	3	2
<b>DIGITAL IMAGE PROCESSING (C402)</b> <u>IV-I-B.TECH(R19)</u>	understand the basic concepts of a digital image processing	3	2	1									2	2		
	Understand the Concepts of Image transforms	2	3										1	1	1	
	Evaluate the techniques for image Enhancement	2	3										1	1		1
	Apply different image restoration techniques for removing blur in the images	2	3											1		
	Interpret image compression standards	2	3										1	1		1
	Interpret image segmentation and representation techniques	2	2										1	1		

### Criteria 3- Program Outcomes and Course Outcomes contd...



**Process of attainment of Course Outcomes**



## Criteria 3- Program Outcomes and Course Outcomes contd...

**Assignment-** Evaluation of assignment is carried out as per course structure and syllabus. This consist of different question which test on analytical skills of the student and average of two Assignment is considered and added to Internal marks

**Quiz** – Quiz is organized under supervision of Institute of Engineers (IE-Chapter) and respective team or student is awarded, which improves the competitive skills of the student.

**Tutorial** - The tutorial sessions for the students provide a clear assessment of the delivery of course content. This is used by the faculty members for the adoption of new pedagogy which suits the needs of students. This ensures maximum knowledge transfer and hence maximizes the impact of the delivery of course content.

**Internals** - these kinds of exams are organized twice in a semester and 75% of the best performance and 25% of the least performance are considered for the weightage of internal marks. The questions that can be asked in internal examination should satisfy the Course Outcomes.

**Skill Development Courses/Value Added Courses** - two Internal examinations shall be conducted one in the middle of the semester and the other at the end of the semester for 30 marks and the marks scored by the student in these exams with a weightage of 0.75 for better score and 0.25 for the other score will be awarded as Internal marks for 30. The remaining 70 marks are based on the end exam performance.

**Mini projects are introduced in third year;** a latest technical description has to submit by the student which is evaluated by the External examiner for 50 marks and 25 marks by the internal evaluation. This is to keeping them on par with the latest technical know-how

## Criteria 3- Program Outcomes and Course Outcomes contd...

**Project** topic should be approved by Internal Department Committee (IDC). Out of total 150 marks for the project work, 50 marks shall be for Internal Evaluation and 100 marks for the End Semester Examination. The evaluation of project work shall be conducted at the end of the IV year II semester.

**Comprehensive Viva Voce** is introduced to assess the student performance in all subjects and it is evaluated for 50 marks by the external examiner. This gives continuous comprehensive evaluation of the student.

**End Examinations** validate the student performance to attain course outcomes and hence the program outcomes. In addition examinations ensure that, only those students who have attained the programme outcomes are actually awarded the programme certificate.

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

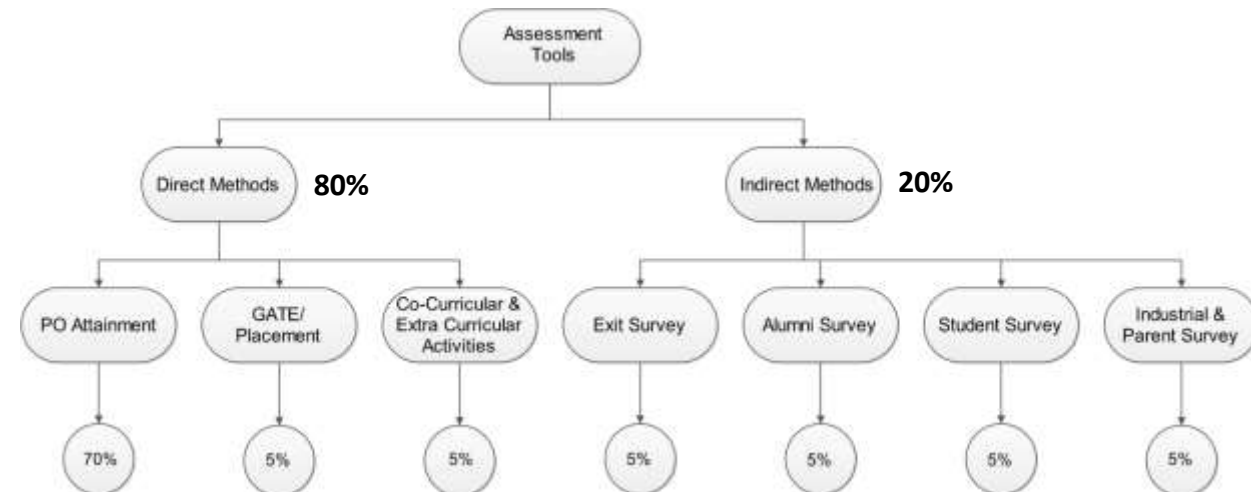
The assessment tools used and their weights to find the Program Outcomes and Program Specific Outcomes is shown in Fig.

#### Direct Methods:

Overall PO attainment  
GATE/GRE Placements  
Co-Curricular & Extra Curricular

#### In-Direct Methods:

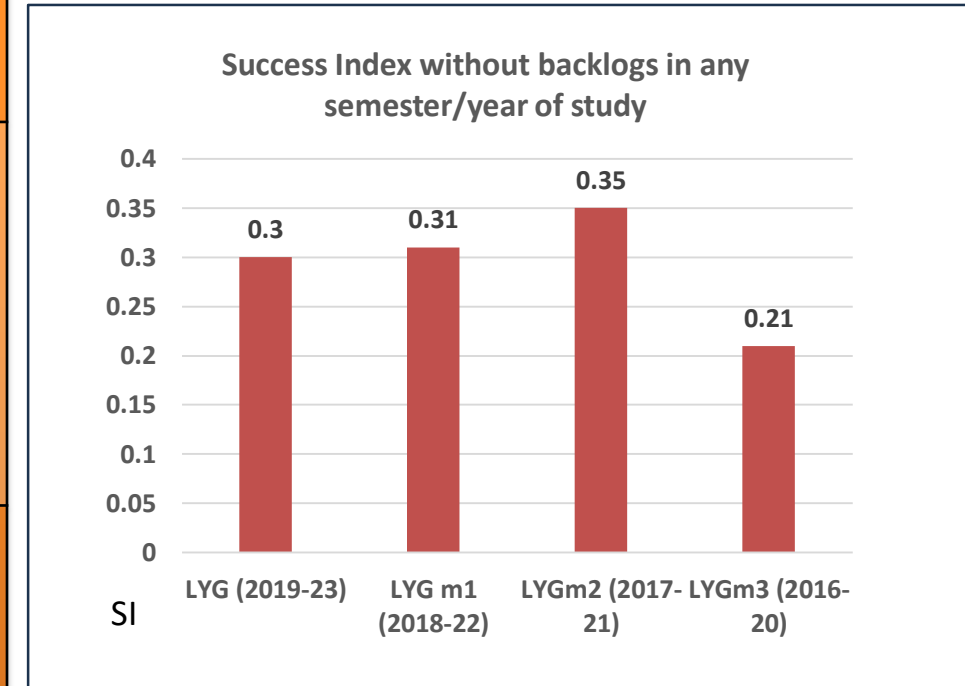
Exit Survey  
Alumni Survey  
Student Survey  
Industrial & Parent Survey



# Students' Performance

## Success Index without backlogs in any semester/year of study

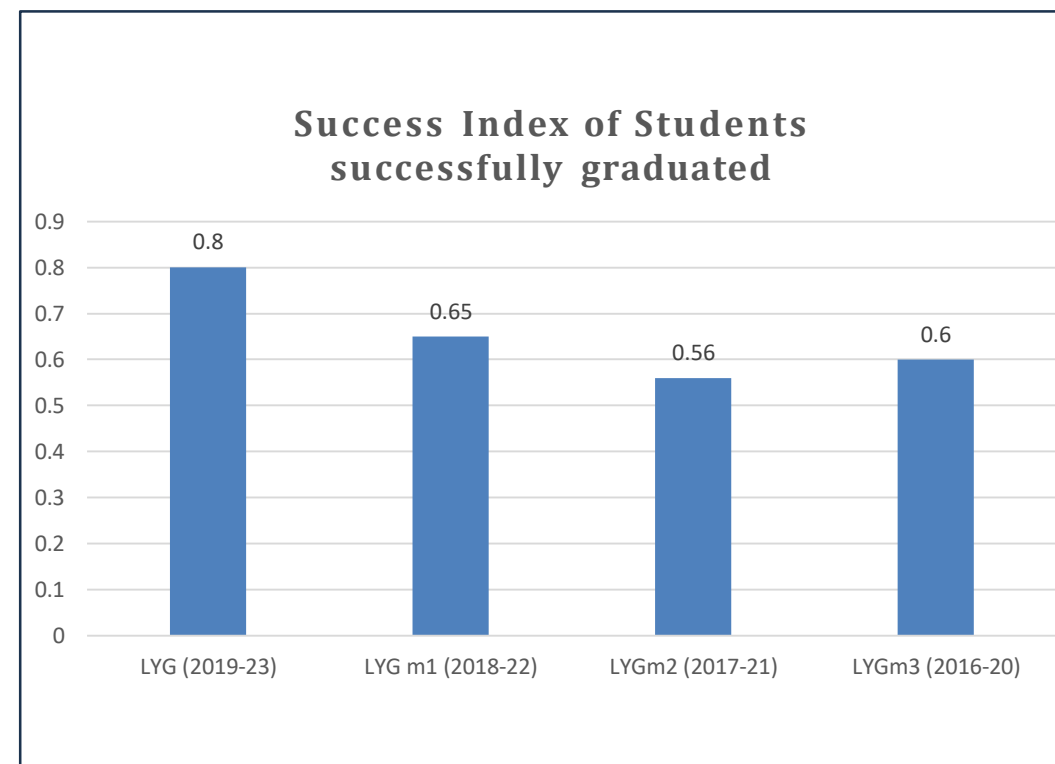
Item	Latest Year of Graduation, LYG (2019-23)	Latest Year of Graduation minus 1, LYGm1 (2018-22)	Latest Year of Graduation minus2, LYGm2 (2017-21)	Latest Year of Graduation minus3, LYGm3 (2016-20)
<b>X: Number of students admitted in the corresponding First Year + admitted in 2<sup>nd</sup> year via lateral entry and separate division, if applicable</b>	284	260	241	250
<b>Y: Number of students who have graduated without backlogs in the stipulated period</b>	86	80	84	53
<b>Success Index(SI) = Y/X</b>	0.30	0.31	0.35	0.21
<b>Average Success Index = (S1+S2+S3+S4)/4 = 0.29</b>				
<b>Assessment = [15*0.29]=4.35</b>				



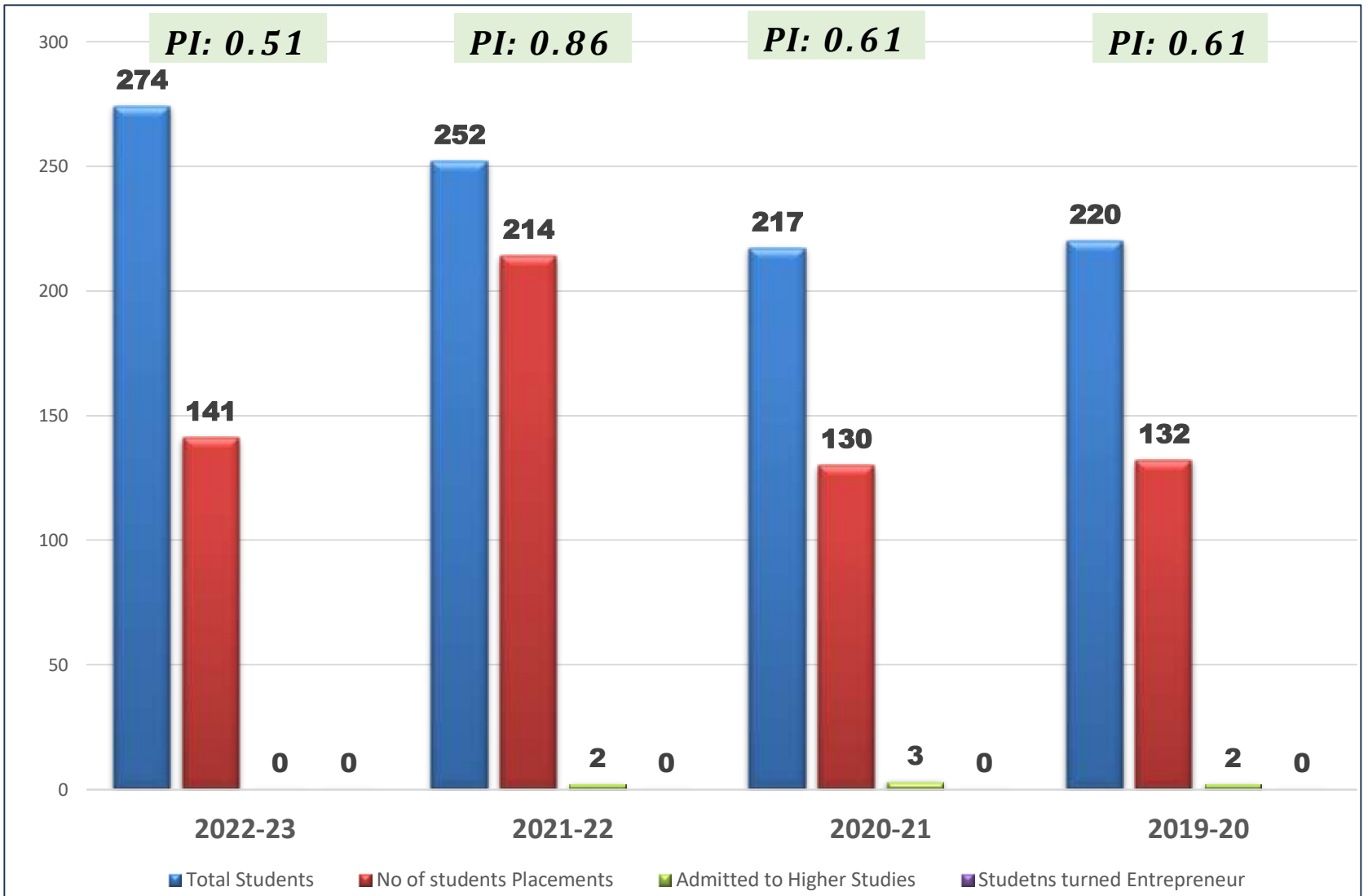
# Students' Performance

## Success Index of Students successfully graduated

Item	Latest Year of Graduation, LYG (2019-23)	Latest Year of Graduation minus1, LYGm1 (2018-22)	Latest Year of Graduation minus2, LYGm2 (2017-21)	Latest Year of Graduation minus3, LYGm3 (2016-20)
Number of students admitted in the corresponding First Year + admitted in 2 <sup>nd</sup> year via lateral entry and separate division, if applicable	284	260	241	250
Number of students who have graduated in the stipulated period	228	169	136	150
Success Index(SI)	0.80	0.65	0.56	0.6
<b>Average Success Index = 0.65</b>				
<b>Success rate = <math>[5 \times 0.65] = 3.25</math></b>				



# Placement, Higher Studies and Entrepreneurship



Average Placement Index 0.65

- Total students
- No. of Students Placed
- Admitted to higher studies
- Students turned entrepreneur

PI: Placement Index

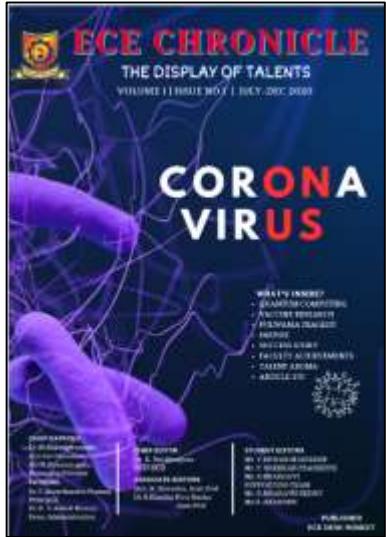
# The Professional Bodies/ Societies & Organised Events

<b>Professional Bodies</b>	<b>IE(I)</b> - The Institution of Engineers(India) Students' Chapter <b>ISTE</b> – Indian Society for Technical Education Students' Chapter <b>IEEE</b> – Institute of Electrical and Electronics Engineers Students' Chapter <b>IIC</b> – Institution's Innovation Council
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Name of the Activities	2022-23	2021-22	2020-21	Total
Events organised under IE(I) Students' Chapter	24	-	-	24
Events organised under ISTE Students' Chapter	12	-	-	12
Events organised under IEEE Students' Chapter	11	-	-	11
Programmes Conducted by Institution's Innovation Council (IIC)- RGM CET	26	26	-	52
Free-online Courses offered by ISRO-IIRS, Dehradun	16	13	11	40
International Conference	1	-	-	1
National Conference	-	-	1	1
<b>Total</b>	90	39	12	141

# Publication of Departmental news letters(ECE CHRONICLE)

List of ECE Students involved in Publication of News Letters			
Year	Semester	Volume/Issue	Student Editors
2020-21	I	<u>Volume 1/Issue 1</u>	Mr. V. Eswar Manideep Mr. P. Sreekar Praneeth Ms. S. Bhargavi Mr. R. Bharth Reddy Ms. S. Shaheen Mr. A. Vamsi
	II	<u>Volume 1/Issue 2</u>	
2019-20	I	<u>Volume 2/Issue 1</u>	
	II	<u>Volume 2/Issue 2</u>	
2017-19	I	<u>Volume 3/Issue 1</u>	
	II	<u>Volume 3/Issue 2</u>	



# Participation of students in different activities

Academic Year	No. of Students who received cash incentives of Rs. 25,000/-	No. of students Presented paper in International Conference	No. of students in Sports and other activities	Total
2022-23	-	10	14	24
2021-22	2	-	11	13
2020-21	3	-	10	13
<b>Total</b>	<b>5</b>	<b>10</b>	<b>35</b>	<b>50</b>





# Faculty Information and Contributions

## Student-Faculty Ratio(SFR)

2022-23 Academic Year (1 <sup>st</sup> July 2022 to 30 <sup>th</sup> June 2023)				
Program	II Year	III Year	IV Year	Total Strength
	2021 Batch	2020 Batch	2019 Batch	UG
UG (ECE)	240+37	240+32	240+25	814
Program	I Year	II Year		Total Strength
	2022 Batch	2021 Batch		PG
PG (ES)	18	18		36
<b>Total Strength</b>				<b>850</b>
Academic Year	Professors	Associate Professors	Assistant Professors	Total Faculty available
2022-23	5	5	38	48

**SFR = 850/48 = 17.71**

2021-22 Academic Year (1 <sup>st</sup> July 2021 to 30 <sup>th</sup> June 2022)				
Program	II Year	III Year	IV Year	Total Strength
	2020 Batch	2019 Batch	2018 Batch	UG
UG (ECE)	240+32	240+25	240+31	808
Program	I Year	II Year		Total Strength
	2021 Batch	2020 Batch		PG
PG (ES)	18	18		36
<b>Total Strength</b>				<b>844</b>
Academic Year	Professors	Associate Professors	Assistant Professors	Total Faculty available
2021-22	5	5	39	49

**SFR = 844/49 = 17.22**

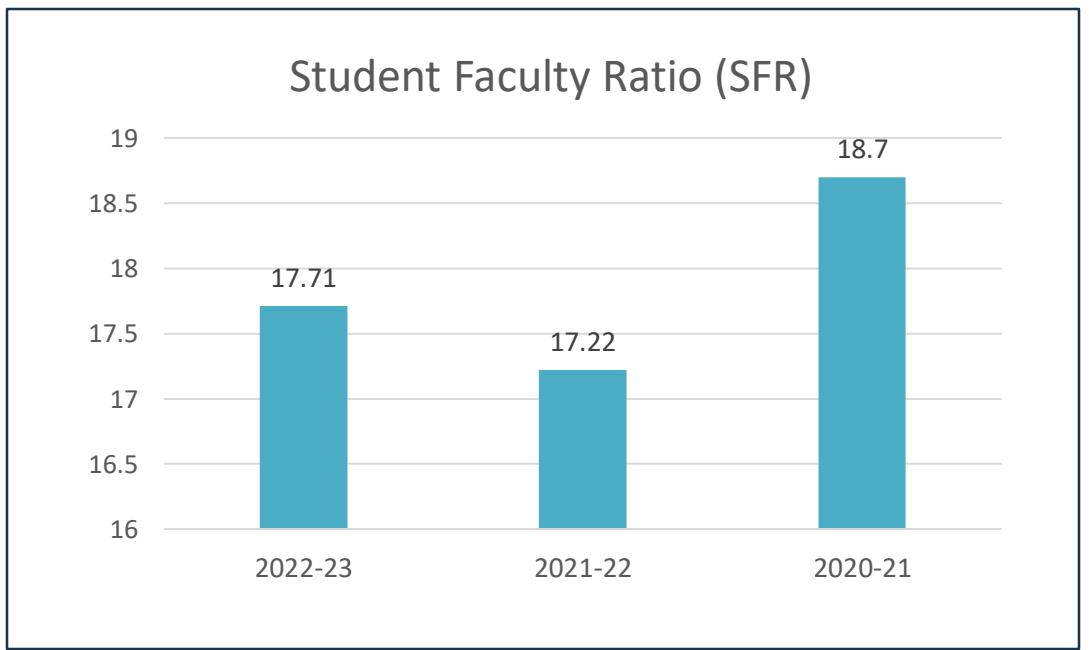
# Faculty Information and Contributions

## Student-Faculty Ratio(SFR)

2020-21 Academic Year (1 <sup>st</sup> July 2020 to 30 <sup>th</sup> June 2021)				
Program	II Year	III Year	IV Year	Total Strength
	2019 Batch	2018 Batch	2017 Batch	UG
UG (ECE)	240+25	240+31	240+11	787
Program	I Year	II Year		Total Strength
	2020 Batch	2019 Batch		PG
PG (ES)	18	18		36
<b>Total Strength</b>				<b>823</b>
Academic Year	Professors	Associate Professors	Assistant Professors	Total Faculty available
2020-21	6	6	32	44

**SFR = 823/44 = 18.70**

Academic Year	No. of Students	No. of Faculty	Student Faculty Ratio (SFR)
2022-23	850	48	17.71
2021-22	844	49	17.22
2020-21	823	44	18.70
<b>Average SFR</b>			<b>17.88</b>



# Faculty Cadre Proportion & Qualification

## Faculty Cadre Proportion

Year	Professors		Associate Professors		Assistant Professors	
	Required	Available	Required	Available	Required	Available
CAY (2022-23)	4.00	5.00	9.00	5.00	28.00	38.00
CAYm1 (2021-22)	4.00	5.00	9.00	5.00	28.00	39.00
CAYm2 (2020-21)	4.00	6.00	9.00	6.00	27.00	32.00
Average Numbers	4.00	5.33	9.00	5.33	27.67	36.33

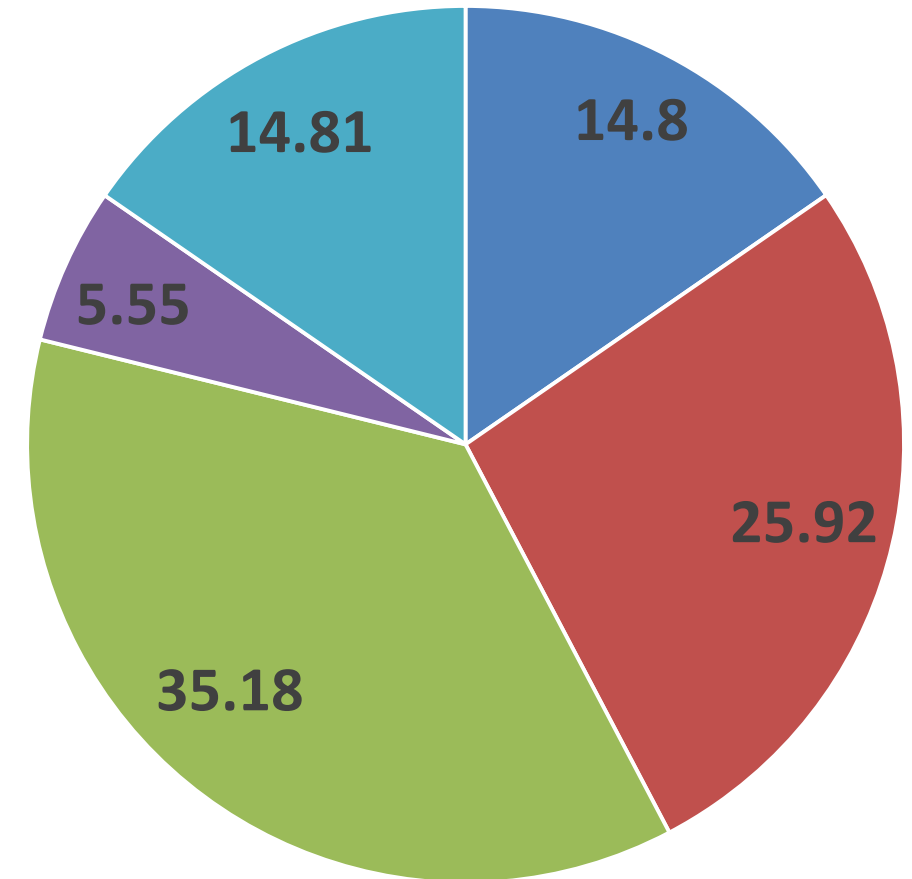
## Faculty Qualification

	X	Y	F	$FQ = 2*[(10X + 4Y)/ F]$
CAY (2022-23)	10	38	42.00	12.00
CAYm1 (2021-22)	14	35	42.00	13.33
CAYm2 (2020-21)	15	30	41.00	13.17

# Faculty Retention & Faculty Competencies

## Faculty Competencies

<i>Faculty Retention</i>		
Description	2022-23 (CAY)	2021-22 (CAYm1)
Number of Faculty Retained	31	40
Total Number of Faculty	44	44
Percentage of Faculty Retained	70	91
Average percentage of Retention	81.00	



- Signal Processing
- Image Processing
- VLSI
- Control Systems
- Embedded System

# Faculty Publications

AY	International						National		Total
	SCI/ SCIE	ESCI	Scopus	Journals	Conference	Book Chapters	Journal	Conference	
2022-23	6	00	10	07	09	00	00	00	32
2021-22	16	00	05	00	01	00	00	00	22
2020-21	10	05	03	05	02	02	00	00	27
<b>Total number of Publications in 3 Academic years</b>									<b>81</b>

# Funding Projects and Consultancy Works

Title of the Project/ MODROBS/GoC/ STTP/ Seminar	Name of the Investigator	Amount Funded (Rs.)	Funding Agency	Status of the Project (Ongoing /Completed)	Year of Sanction
DST-FIST Program	Dr.T.Jayachandra Prasad	60,00,000	FIST/DST Govt. of India	Ongoing	2018-19
Design of CNT Based TSVs for realistic 3D Integrated Circuits	Dr. V. Ramesh Kumar	39,60,990	SERB/DST Govt. of India	Completed (August-2022)	2017-18
Unnat Bharat Abhiyan (Development Digital Class rooms in Neeavada & Bhupanapadu Villages )	Dr.T.Jayachandra Prasad	2,50,000/-	UGC	Completed (2022)	2019-20
Total amount		1,02,10,990			

S.NO	AY	Consultancy Work Title	Name of the Consultant	Amount of consultancy work (Rs.)
1.	2021-22	Design and develop instruments/ systems for measuring the electrical and bio-photon responses from plants and for generating stimulus	SSASR	10,50,000
2.	2020-21	Design, development, Performance Evaluation Facility of solar dryers for long run storage of agriculture produce	Steel Hacks	8,15,000
3.	2019-20	Design, Development, Procurement of instruments required for “Elevator Control System”	Entellus IoT Labs Pvt Ltd	2,15,000

# Faculty Development Work

## Professional Society Corporate Memberships

ISTE Life Membership	IETE Life Membership			IE(I) Life Membership			NAFEN	MIEEE	MIAENG	MISOI	MISRD	IFERP
	Fellow	Member	Associate Member	Fellow	Member	Associate Member						
9	6	5	2	1	5	1	1	2	4	2	1	2

**NPTEL/SWAYAM/MOOCs Courses done by Department Faculty : 30**

### *Faculty participation in FDP/training activities/STTPs*

Activity/Academic Year	2023-23	2021-2022	2020-2021	Total
FDPs/STTPs/OCs	87	10	112	209
Workshops/Trainings	2	0	10	12
Webinars-Seminars/Guest Lectures/Conferences	7	5	0	12
<b>Total</b>	<b>96</b>	<b>15</b>	<b>122</b>	<b>233</b>

### *Faculty development/training activities/STTPs organized by the department*

Activity/Academic Year	2022-2023	2021-2022	2020-2021	Total
FDPs/STTPs/OCs	3	0	1	4

# *Ph.D. guided /Ph.D. awarded while working in the institute*

## *Ph.D. guided /Ph.D. awarded while working in the institute*

Ph.D. were awarded under the supervision of our Faculty	2
Ph.D. guiding during the assessment period while working in the institute	15
Faculty got awarded Ph.D. degree during the assessment period	2
Number of our faculty who are pursuing Ph.D. degree	11

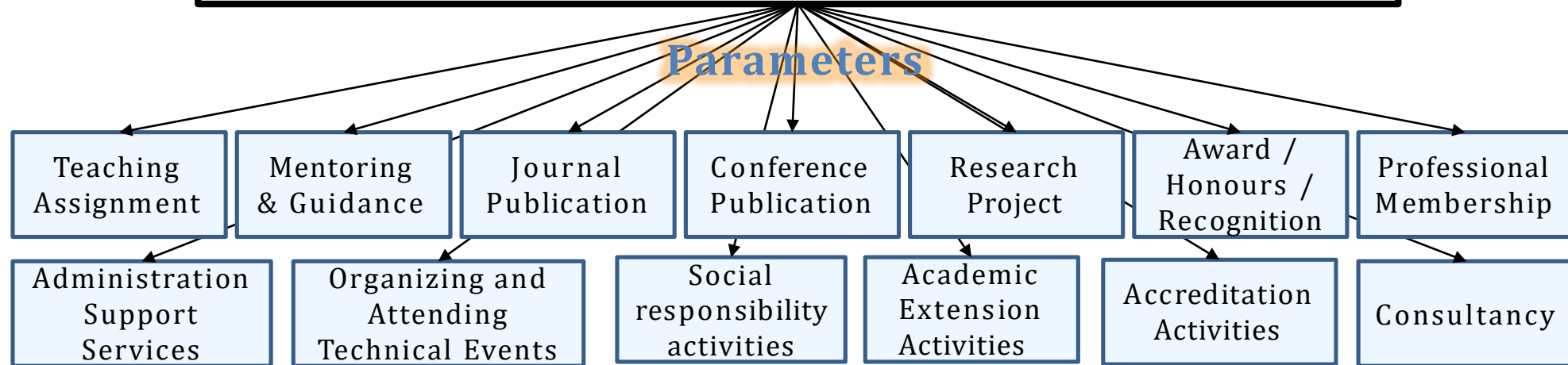
## *Faculty Interaction with outside World*

S.No	Academic Year	No. of Faculty
1	2022-23	06
2	2021-22	06
3	2020-21	04



# Faculty Performance Appraisal

The performance of each faculty is evaluated **every year** through a comprehensive self-appraisal system.



➤ Students Feedback plays a major role.

- Direct Feedback
- Indirect Feedback
- Result Analysis

# Facilities and Technical Support

S.NO	Block	Room No	AREA Sqm	Status of Utilization
1	RB Block	2010	70.7281	Utilized
2	RB Block	2020	70.7281	Utilized
3	RB Block	2030	70.7281	Utilized
4	RB Block	2130	70.7281	Utilized
5	RB Block	2140	70.7281	Utilized
6	RB Block	2150	70.7281	Utilized
7	RB Block	3010	70.7281	Utilized
8	RB Block	3020	70.7281	Utilized
9	RB Block	3030	70.7281	Utilized
10	RB Block	3130	70.7281	Utilized

S.NO	Block	Room No	AREA Sqm	Status of Utilization
1	RB Block	2040	22.5656	Utilized
1	RB Block	2050	22.5656	Utilized
2	RB Block	2060	24.0285	Utilized
3	RB Block	2200	44.7560	Utilized
4	RB Block	2210	24.9848	Utilized
5	RB Block	2220	22.5656	Utilized
6	RB Block	2160	22.5656	Utilized
7	RB Block	2170	22.5656	Utilized
8	RB Block	2180	24.0285	Utilized
9	RB Block	3040	22.5656	Utilized
10	RB Block	3050	22.5656	Utilized
11	RB Block	3060	24.0285	Utilized
12	RB Block	3200	22.5656	Utilized
13	RB Block	3210	24.9848	Utilized
14	RB Block	3220	44.7560	Utilized

# *Laboratories in the Department*

S.no.	Name of the Laboratory	Room No	AREA Sqm	Name of the Technical Staff
1	Simulation Lab-I	2080	70.00	Mr.Y.Madhusudhana Reddy Mr.K.Seenu Babu
2	Microwave & Optical Communications Lab	2090	143.22	Dr.V.N.V.Satya Prakash Mr.G.Y.Subramanyyam
3	Microprocessor & Microcontrollers Lab			
4	Digital Logic Design Lab	2100	143.22	Dr.J.Sofia Priyadharshini Mr.G.Y.Subramanyyam
5	Electronic Circuit Design & Troubleshooting Lab			
6	Analog Communications Lab	2110	143.22	Dr.M.Chennakesavulu Mr.K.Seenu Babu
7	Digital Communications Lab			

# *Laboratories in the Department*

S.no.	Name of the Laboratory	Room No	AREA Sqm	Name of the Technical Staff
8	Simulation Lab-II	3080	70.00	Ms.M.Maheswari Mr.Shaik Saddam Hussain
9	IOT Lab	3090	143.22	Ms.N.Fouzia Sulthana Mr.Shaik Saddam Hussain
10	Ideation and Innovation Centre			
11	Electronic Devices & Circuits Lab	3100	143.22	Mr.N.Nagarjuna Kumar Ms.D.Sandya Rani
12	Electronic Circuit Analysis & Design Lab			
13	Sensors & Transducers Lab	3110	143.22	Dr.Hanuma Naik Mr.V.Hari Hara Prasada Reddy
14	IC Applications			
15	Digital Simulation Lab-IV	1110	70.56	Dr.C.Venkaitaiah Mr.Shaik Saddam Hussain
16	Digital Simulation Lab-III	1120	70.56	Mr.P.Rangappa Mr.Shaik Saddam Hussain

# Program Specific Facilities

S.No	Content
1	Recognized as Research Center from University - JNTUA
2	<u>VLSI Design Lab (Cadence)</u>
3	<u>Ideation and Innovation Center (IoT Maker space)</u>
4	<u>Nano Scale Device Simulation Center</u> (Visual TCAD & ATOMISTIX Tool Kit With Virtual Nanolab)
5	<u>Embedded IOT Lab (Modrobots)</u>
6	<u>IOT Lab Incubation Center</u>

# Measures Taken To Improve POs' Attainment Levels

Pos	Target Level	Attainment Level	Observations
<b>PO1: Engineering knowledge</b>			
<b>Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems</b>			
PO1	1.94	2.74	<ul style="list-style-type: none"> <li>In related to PO1 during CAY, the following subjects have got least PO attainment level.</li> <li>SS(2.33),ARMMC&amp;I(2.718),AWP(2.174),DSP(2.583),MW&amp;OC(2.302),RS(2.632).</li> </ul>
<b>Action: Tutorial classes are offered for the students beyond the working hours to enhance their knowledge in application of TECHNICAL SUBJECTS.</b>			
<b>PO2: Problem analysis</b>			
<b>Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences</b>			
PO2	2.01	2.73	<ul style="list-style-type: none"> <li>In a course on problem analysis, the Student performance has been consistently low with respect to CORE SUBJECTS.</li> <li>As mentioned above the percentage of students who are passed the courses in relation with analytical skills using of TECHNICAL SUBJECTS AND are consistently low because of SOME students.</li> </ul>
<b>Action: Tutorial classes are offered for the THOSE students beyond the working hours to enhance their knowledge in analytical skills using of TECHNICAL SUBJECTS.</b>			
<b>PO3: Design/development of solutions</b>			
<b>Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consider action for the public health and safety, and the cultural, societal, and environmental considerations</b>			
PO3	1.96	2.74	<ul style="list-style-type: none"> <li>In a course design, the Student performance has been consistently moderate with respect to some CO's</li> <li>In relation to satisfy the MISSION statement continuous improvement in curriculum helped the students to attain Design/development of solutions</li> </ul>
<b>Action: In view of the need to design solutions for complex engineering problems, students are required to have their project work on proto type development to meet real time needs.</b>			

# Measures Taken To Improve POs' Attainment Levels contd.

Pos	Target Level	Attainment Level	Observations
<b>PO4: Conduct investigations of complex problems:</b> 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			
PO4	1.51	2.76	<ul style="list-style-type: none"> <li>In a course experiment and complex problems, the Student performance has been satisfied.</li> </ul>
<b>Action: To keep improve the attainment level, laboratories are remains open beyond working hours.</b>			
<b>PO5: Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations			
PO5	1.31	2.75	<ul style="list-style-type: none"> <li>Attainment level is satisfactory because of the availability of the modern tools such as, MATLAB, PSICE, VTCAD and CADENCE</li> </ul>
<b>Action: To keep the attainment level with the help of revised regulations the programme has adequate IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations</b>			
<b>PO6: The engineer and society</b> 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			
PO6	1.19	2.81	<ul style="list-style-type: none"> <li>Attain level is moderate with lagging in ET LAB &amp; MPMC which emphasis on analytical skills.</li> </ul>
<b>Action: To improve the attainment level, tutorial classes are offered beyond the working hours to enhance their knowledge in analytical skills</b>			

# Measures Taken To Improve POs' Attainment Levels contd.

Pos	Target Level	Attainment Level	Observations
<b>PO7: Environment and sustainability</b>			
<b>Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development</b>			
PO7	1.03	2.78	<ul style="list-style-type: none"> <li>Attainment level is satisfactory due to alignment with the third vision statement that specifies TO DEVELOP INDIGENOUS AND APPROPRIATE TECHNOLOGIES AT LOW COST TO HELP THE RURAL PEOPLE.</li> </ul>
<b>Action: To improve attainment level conducting visits to villages and students are doing community service projects for sustainability.</b>			
<b>PO8: Ethics</b>			
<b>Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice</b>			
PO8	0.58	2.63	<ul style="list-style-type: none"> <li>Attainment level is satisfactory due to alignment with mission and THIRD vision.</li> </ul>
<b>Action: To keep attainment level various guest lectures on professions ethics is conducting in regular basis.</b>			
<b>PO9: Individual and Team Work</b>			
<b>Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings</b>			
PO9	1.26	2.77	<ul style="list-style-type: none"> <li>Attainment level is obtained with the constant steps that are included during regular laboratory hours and project work</li> </ul>
<b>Action: To improve attainment level lab hours are increased and conducting investigation on projects by reviews.</b>			



# Measures Taken To Improve POs' Attainment Levels contd.

Pos	Target Level	Attainment Level	Observations
<b>PO10: Communication</b>			
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			
PO10	1.02	2.70	<ul style="list-style-type: none"> <li>Attainment level is satisfactory with involvement of English language and communications language skills lab (ELCS LAB).</li> </ul>
Action: To improve attainment level conducting group discussions and JAM (Just A Minute) sessions to improve the vocabulary of students.			
<b>PO11: Project Management and Finance</b>			
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			
PO11	1.14	2.65	<ul style="list-style-type: none"> <li>In a course of project in multidisciplinary environments, the student performance has been consistently moderate with respect to some CO's</li> </ul>
Action: In order to have continuous improvement and individual involvement size of project batch has been reduced from 5 to 4 members.			
<b>PO12: Life-long learning</b>			
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			
PO12	1.49	2.72	<ul style="list-style-type: none"> <li>Attainment level is satisfactory</li> </ul>
Action: In order to achieve continuous improvement, various guest lectures, seminars and workshops are organized in regular intervals to meet the ability of life- long learning in the broadest context of technological change.			

# Measures Taken To Improve PSOs' Attainment Levels

PSOs	Target Level	Attainment Level	Observations
<b>PSO 1:</b>			
<b>Students are able to analyze and design the electronic circuits with the knowledge of courses related circuits, Networks, Linear digital circuits and Analog electronics.</b>			
<b>PSO 1</b>	1.58	2.79	Attainment level is satisfactory
<b>Action: In order to achieve continuous improvement, concentrated on lab hours for increasing the knowledge of the students related to different circuit designs.</b>			
<b>PSO 2:</b>			
<b>Student can explore the scientific theories, ideas, methodologies in operation and maintenance of communication systems to bridge the gap between academics and industries.</b>			
<b>PSO 2</b>	1.54	2.72	Attainment level is satisfactory
<b>Action: In order to achieve continuous improvement, various guest lectures, seminars and workshops are organized on Professional Ethics and Soft Skills to bridge the gap between academics and industries.</b>			
<b>PSO 3:</b>			
<b>Students are able to work professionally with new cutting edge technologies in the fields of electronic design, communication and automation.</b>			
<b>PSO 3</b>	1.42	2.71	Attainment level is satisfactory
<b>Action: In order to achieve continuous improvement, various guest lectures, seminars and workshops are organized in regular intervals with industry people who are working in core companies to increase the knowledge of the student and also to cope up with the new technologies.</b>			

# Part-II

## OBE Philosophy of the Department

### Program Outcomes:

Engineering Graduates will be able to:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, and engineering specialization to the solution of complex engineering problems.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
- 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 multi-disciplinary environments.
- 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.

# OBE Philosophy of the Department contd....

## Program Specific Outcomes

**PSO- 1:** Students are able to analyze and design the electronic circuits with the knowledge of courses related circuits, Networks, Linear digital circuits and Analog electronics.

**PSO-2:** Student can explore the scientific theories, ideas, methodologies in operation and maintenance of communication systems to bridge the gap between academics and industries.

**PSO-3:** Students are able to work professionally with new cutting edge technologies in the fields of electronic design, communication and automation.

## Program Educational Objectives

- PEO-1:** To train competent Electronics & Communication Engineers in analysis, design and testing of electronics systems by providing modern tools.
- PEO-2:** To prepare graduates to take up gainful employment in core sector and prepare them for a successful career in Multinational companies.
- PEO-3:** To impart skills to develop affordable products for rural people by adopting multidisciplinary approach.
- PEO-4:** To undertake sponsored projects, consultancy and internships by strengthening industry institute collaboration.

**Note:** Program Outcomes (POs) and Program Specific Outcomes (PSOs) are mapped with Course Outcomes (COs) and they are correlated in following levels

1: Slight (Low) - 1

2: Moderate (Medium) - 2

3: Substantial (High) - 3

# OBE Philosophy of the Department contd....

## Dissemination of Vision, Mission and PEOs

Vision statements are modified in the meeting of all stake holders to maintain consistency with the institute Vision.

Modified Vision statements are displayed in the premises of department and awareness created among all stakeholders during BOS meeting and in regular teaching classes

It is made regular practice to the Faculty and Students to maintain conversation about CO's and PO's mapping along with Vision & Mission Statements

Vision, Mission and PEOs are published and disseminated among stake holders

Communicated to the stakeholders through electronic media and meetings

Published at departmental page of the website (<https://www.rgmcet.edu.in/departement-of-ece>).

Displayed in classrooms, corridor, department office, department library and laboratories.

# OBE Philosophy of the Department contd....

## Process for Defining the Vision and Mission:

- The HOD with the active participation of faculty members and based on the continuous feedback from stakeholders develops the vision and mission statement of the department in alignment with Vision and Mission of the University.
- These statements are discussed further among faculty members before finalization.
- The new vision and mission statements are sent to the Board of Studies of the department for approval.
- Finally the Vision and Mission are approved by the Academic Council and the Governing Council.

## Process for Defining PEOs:

- Process for establishing and revising Program Educational Objectives (PEOs) is depicted in figure below. Alumni inputs are obtained through extensive alumni surveys with follow-up email and telephone calls by the Department HOD and associated faculty.
- Students' input to our educational objectives is obtained in a number of traditional ways, including presentations at seminars, course and program surveys, and through focus groups conducted with graduating seniors by the Department HOD.
- This feedback is condensed and presented to faculty at the final faculty meeting. Students also participate in a course evaluation process at the end of each course.

# OBE Philosophy of the Department contd....

## Steps to Process the Defining of PEOs

**STEP-1:** The thrust areas are identified from existing literature from industries, electronic media and interaction with the society before listing of PEOs.

**STEP-2:** PEOs are stated by the organizing Committee of the department after thorough investigation.

**STEP-3:** PEOs are communicated to the industry experts, Academician and alumni, their recommendations are incorporated.

**STEP-4:** PEOs are analytically discussed within the department, feedback is conceded and finalized.

## Consistency of PEOs with Mission of the Department

**M1-** To educate the students in latest technologies to achieve best standards in theoretical and practical aspects.

**M2 -** To have a strong collaboration with electronics industry.

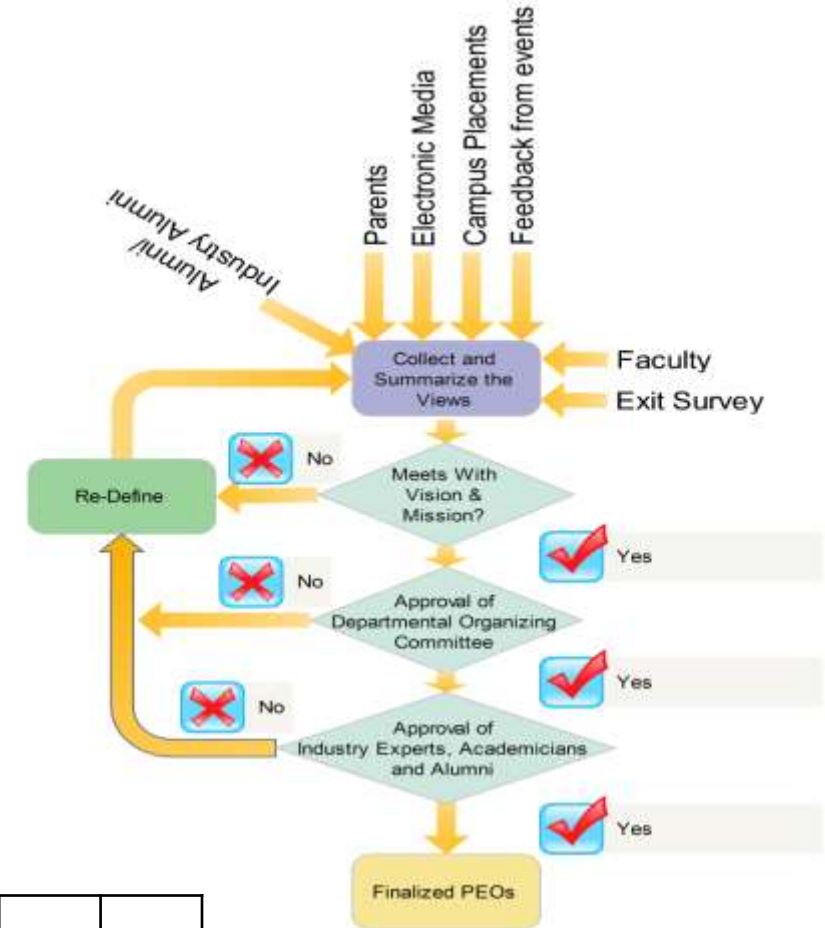
**M3-** To develop indigenous and appropriate technologies at low cost to help the rural people.

PEO Statements	M1	M2	M3
<b>PEO-1:</b> To train competent Electronics & Communication Engineers in analysis, design and testing of electronics systems by providing modern tools.	2	3	3
<b>PEO-2:</b> To prepare graduates to take up gainful employment in core sector and prepare them for a successful career in Multinational companies.	3	2	3
<b>PEO-3:</b> To impart skills to develop affordable products for rural people by adopting multidisciplinary approach.	3	2	3
<b>PEO-4:</b> To undertake sponsored projects, consultancy and internships by strengthening industry institute collaboration.	3	3	3

# OBE Philosophy of the Department contd....

## Courses are Introduced in the Regulation Revised R-2019 & R-2020:

- Internet of Things.
- ARM Microcontroller and its Interfacing.
- NPTEL-MOOCs certification courses
- Training & Placement Activities
- Design Thinking and Innovations.
- Embedded System Design.
- Machine Learning.



## Program Articulation Matrix (2022 – 23)

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
Average of SET PO	2.24	2.25	2.09	1.74	1.59	1.8	1.77	1.33	1.82	1.52	1.8	1.55	1.7	1.7	1.64



# OBE Philosophy of the Department contd....

## Course Articulation Matrix

Course	Course Outcome Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
<b>ELECTRONIC DEVICES AND CIRCUITS (C201)</b> <b>II-B.Tech-I-sem (R20)</b>	Understand and analyze the principle of operation and equivalent electrical model for semiconductor devices like PN diode, Zener diode.	3	2										1	2	2		
	Apply the property of junction diode in rectifiers and regulators.	1	3										1	2	3		
	Understand and analyse the principle of operation and equivalent electrical model for semiconductor devices like BJT	2		3									1	1	2	1	
	Understand and analyse the principle of operation and equivalent electrical model for field effect transistors: JFET, MOSFET		2	3										1	2	1	
	Obtain the Q point for various biasing techniques for BJT.	3	2	2	2									2	1	2	2
	Obtain the Q point for various biasing techniques for JFET, MOSFET.	3	2	2	2									2	2	1	1
<b>SIGNALS AND SYSTEMS (C202)</b> <b>II-B.Tech-I-sem (R20)</b>	Classify the continuous and discrete time signals & systems and understand the sampling theorem.	3	1	2	0								1	0			
	Analyze the continuous time signals using Fourier analysis.	2	3	2	0								1	1	2		
	Analyze the discrete time sequences using DTFT	1	2	1	1								1	0	1		
	Understand the Concept of convolution, correlation are useful for analysis in the areas of linear systems and communication theory.	2	2	1	0									1	1	1	1
	Apply the different transforms to analyze the continuous and discrete time signals.	1	2	2	1									1	2	1	1

### Rubrics Developed to Validate the POs :

#### CO-Attainment Method:

#### (For the course of Microwave Engineering and Optical Communication)

Generally, the approach in evaluating the attainment of CO is using existing data from students' marks, for example final exam, internals and assignments. These assessments are referred as formal/ direct assessment. This method is chosen because of the information is readily available and it is common for most courses. In general, assessment methods used are grouped into 3 categories for theory courses: (1) Final exam (2) Internal Tests and (3) Assignments and for practical courses final exam and internal test only. Each of these categories contributes a certain portion of the marks into some of the Cos.

# OBE Philosophy of the Department contd....

As a model of explaining the process, it considered about a course called **Microwave Engineering and Optical Communication** of IV-B. Tech, I-Sem follows RGM-R-19 Regulations.

1. Initially the End exam Question Paper is properly assessed with the marks weightage including choice questions (Total of 98 marks) for CO1 to CO6, which can be observed in Table B.3.2.1. Similarly Mid1 & MID 2(60 Marks) papers as shown in Table B.3.2.2., as well Assignment1 & Assignment2(10 Marks) are also evaluated as shown in Table B.3.2.3., for their weightage as per the regulations shown in Table B.3.2.4.
2. Accordingly End exam, MID and assignment papers are evaluated for their percentage weightages for each CO as shown in Table B.3.2.5.
3. Based on the overall percentage distribution, the CO-mark needs to be calculated so that the score is normalized accordingly. Using example in Table 3.2.6, the new mark for CO1 will be:

$$\text{Marks CO1} = (0.20 \times \%FE \times 0.70) + (0.15 \times \%INT \times 0.25) + (0.20 \times \%ASS \times 0.05)$$

*Similarly, for CO2:*

$$\text{Marks CO2} = (0.1 \times FE \times 0.7) + (0.2 \times INT \times 0.25) + (0.2 \times ASS \times 0.05) \text{ and so on up to CO6.}$$

Where FE is the student's Final Exam mark, INT is the student's mid exam marks ASS is the student's Assignment mark.

## OBE Philosophy of the Department contd....

4. The students' marks are tabulated according to the assessment groups. These marks are then used to calculate the CO-marks.

5. Normalised CO values are calculated for each CO by dividing each percentage CO weight with the Average value of % weightage of each CO. **Ex:  $N.CO1=CO1/Avg.CO1$**

Similarly calculations are done up to N.CO6 as shown in Table B.3.2.6.

6. The categorization is made with the thresh hold value 60% as per the Table B.3.2.7; which explains about the No. of students attained more than 60% normalized values are given 3 weightage points as they have strongly attained. 2 weightage points are given to the normalized values in between 40% to 60% and 1 weightage point is marked for the normalized values below 40%. This Table clearly gives the details about the no. of students attained the weightage points 3,2 & 1.

7. Attainment CO values are calculated:

$$CO1 = \sum \frac{(No. of students attained) * (the weightage points given)}{(Total No. of students)}$$

**As per the Table B.3.2.8,  $(189*3+66*2+12*1)/267 = 2.66$**

8. PO attainment values are calculated as per the Table B.3.2.8. In this table CO1 to CO6 attained values are tabulated column wise and these values are correlated with the program articulation matrix table, which already available with the curriculum- syllabus for the respective course. PO attainment values are calculated:

$$PO1 = \sum \frac{(CO attainment value) * (the mapping values)}{(Total mapping pints)}$$

**$PO1=(2.66*2+2.52*0+2.72*0+2.80*2+2.67*1+2.70*2)/(2+0+0+2+1+2)=2.71$**

# OBE Philosophy of the Department contd....

**Table B.3.2.1 Assessment of End Exam Question Paper**

External Question Paper Marks --> Cos							
Q.No.	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	Total
1 a)		2					2
b)			2				2
c)	2						2
d)	2						2
e)				2			2
f)			2				2
g)			2				2
2 a)		9					9
b)					5		5
c)							0
3 a)		9					9
b)						5	5
c)							0
4 a)		7					7
b)				7			7
c)							0
5 a)			7				7
b)					7		7
c)							0
6 a)	6						6
b)						8	8
c)							0
7 a)		7					7
b)	7						7
c)							0
<b>Total</b>	17	34	13	9	12	13	98

**Table B.3.2.2 Assessment of Mid Exam Question Paper**

Mid I Marks --> Cos								Mid II Marks --> Cos							
Q.No.	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	Total	Q.No.	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	Total
1 a)	1						1	1 a)	1						1
b)		1					1	b)	1						1
c)	1						1	c)		1					1
d)		1					1	d)		1					1
e)	1						1	e)	1						1
2 a)						3	3	2 a)		3					3
b)		2					2	b)		2					2
3 a)				3			3	3 a)			3				3
b)	2						2	b)						2	2
4 a)			3				3	4 a)			3				3
b)	2						2	b)				2			2
5 a)		3					3	5 a)					3		3
b)					2		2	b)					2		2
<b>Total I</b>	7	7	3	3	2	3	25	<b>Total</b>	3	7	6	2	5	2	25
						<b>Total</b>	10	14	9	5	7	5	50		

**Table B.3.2.3 Assessment of Assignment Question Paper**

Assignment 1 Marks --> Cos								Assignment 2 Marks --> Cos							
	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	Total		CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	Total
	2	1	2	2	2	1	10		2	2	2	2	1	1	10
<b>Total</b>	2	1	2	2	2	1	10	<b>Total</b>	2	2	2	2	1	1	10

<b>Total</b>	4	3	4	4	3	2	20
<b>Total</b>	4	3	4	4	3	2	20

# OBE Philosophy of the Department contd....

**Table B.3.2.4 Regulation weightage marks**

Regulation Weightage of Marks		
Final Exam	Internal Tests	Ass/Quiz
70	20	10
0.7	0.2	0.1

**Table B.3.2.5 percentage weightages for each CO**

Weightage marks for each CO							
	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	Total
EM	17	34	13	9	12	13	98
IM	10	14	9	5	7	5	50
AM	4	3	4	4	3	2	20

% Weightage of each CO							
	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	Total
EM (%)	17.3469	34.6939	13.2653	9.18367	12.2449	13.2653	100
IM (%)	20	28	18	10	14	10	100
AM (%)	20	15	20	20	15	10	100
Avg	18.1429	31.3857	14.8857	10.4286	12.8714	12.2857	100

# OBE Philosophy of the Department contd....

Table B.3.2.6 Percentage Weightages for each CO

S.No	Reg.No.	Internal marks	Assignment marks	Final Internal marks	Total Final Marks	External Marks	% of IM	% of AM	% of EM	N CO 1	N CO 2	N CO 3	N CO 4	N CO 5	N CO 6
1	19091A0405	17	10	27	72	45	85	100	64.28571	72.78965	69.68854	74.09378	75.10763	72.9538608	70.56478
2	19091A0407	13	10	23	89	66	65	100	94.28571	88.45894	89.33351	87.97094	89.76517	88.5809418	89.98339
3	19091A0408	18	10	28	79	51	90	100	72.85714	79.6288	77.21308	80.64985	81.35029	79.7494847	77.85714
4	19091A0411	15	10	25	75	50	75	100	71.42857	75.36558	73.4313	76.13107	77.59295	75.5351197	74.33555
5	19091A0413	15	10	25	80	55	75	100	78.57143	80.14623	78.95832	80.58678	81.99609	80.2917393	79.73422
6	19091A0414	15	10	25	67	42	75	100	60	67.71654	64.58807	69.00192	70.54795	67.9245283	65.69767
7	19091A0415	17	10	27	74	47	85	100	67.14286	74.70191	71.89934	75.87606	76.86888	74.8565086	72.72425
8	19091A0416	17	10	27	81	54	85	100	77.14286	81.39483	79.63717	82.11407	83.03327	81.5157761	80.28239
9	19091A0421	16	10	26	83	57	80	100	81.42857	83.16085	82.06125	83.57828	84.71624	83.2820675	82.70764
10	19091A0423	16	10	26	81	55	80	100	78.57143	81.24859	79.85045	81.796	82.95499	81.3794197	80.54817
11	19091A0429	18	10	28	85	57	90	100	81.42857	85.36558	83.8455	85.99671	86.63405	85.4574283	84.33555
12	19091A0434	13	10	23	53	30	65	100	42.85714	54.03825	49.53898	55.88977	58.06262	54.3332805	51.11296
13	19091A0436	19	10	29	85	56	95	100	80	85.51181	83.63223	86.31478	86.71233	85.5937847	84.06977
14	19091A0441	11	10	21	74	53	55	100	75.71429	73.82452	73.17901	73.96764	76.39922	74.0383701	74.31894
15	19091A0442	15	10	25	72	47	75	100	67.14286	72.49719	70.11509	73.45764	74.95108	72.6811479	71.09635
16	19091A0444	12	10	22	62	40	60	100	57.14286	62.49719	59.70089	63.59199	65.90998	62.7588394	61.09635
17	19091A0450	15	10	25	73	48	75	100	68.57143	73.45332	71.2205	74.34878	75.8317	73.6324719	72.17608
18	19091A0451	19	10	29	86	57	95	100	81.42857	86.46794	84.73763	87.20592	87.59295	86.5451086	85.1495
19	19091A0452	11	10	21	70	49	55	100	70	70	68.7574	70.40307	72.87671	70.2330744	70
20	19091A0459	18	10	28	78	50	90	100	71.42857	78.67267	76.10768	79.75871	80.46967	78.7981608	76.77741
21	19091A0463	11	10	21	57	36	55	100	51.42857	57.5703	54.38715	58.81821	61.42857	57.86586	55.96346
22	19091A0466	17	10	27	77	50	85	100	71.42857	77.5703	75.21555	78.54949	79.51076	77.71048	75.96346
23	19091A0474	10	10	20	56	36	50	100	51.42857	56.46794	53.49503	57.60899	60.46967	56.77818	55.1495
24	19091A0478	18	10	28	84	56	90	100	80	84.40945	82.7401	85.10557	85.75342	84.5061	83.25581
25	19091A0482	19	10	29	67	38	95	100	54.28571	68.30146	63.73496	70.2742	70.86106	68.46995	64.63455

# OBE Philosophy of the Department contd....

**Table B.3.2.7 Percentage weightage for each CO**

	CO 1		CO 2		CO 3		CO 4		CO 5		CO 6	
	No. of students Attained	Weightage Points	No. of students Attained	Weightage Points	No. of students Attained	Weightage Points	No. of students Attained	Weightage Points	No. of students Attained	Weightage Points	No. of students Attained	Weightage Points
<b>&gt;= 55%</b>	189	3	162	3	202	3	221	3	192	3	175	3
<b>40% to 55%</b>	66	2	81	2	55	2	38	2	63	2	75	2
<b>&lt;40%</b>	12	1	24	1	10	1	8	1	12	1	0	1
<b>Total No. of students</b>	267		267		267		267		267		250	
<b>Atainment value</b>		<b>2.66</b>		<b>2.52</b>		<b>2.72</b>		<b>2.80</b>		<b>2.67</b>		<b>2.70</b>
<b>% of Attainment</b>		<b>70.79</b>		<b>60.67</b>		<b>75.66</b>		<b>82.77</b>		<b>71.91</b>		<b>70.00</b>
<b>Attained or not</b>		<b>YES</b>		<b>YES</b>		<b>YES</b>		<b>YES</b>		<b>YES</b>		<b>YES</b>

**Table B.3.2.8 Percentage weightage for each PO**

CO	CO Attainment Value	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
<b>CO 1</b>	2.66	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0
<b>CO 2</b>	2.52	0	3	2	0	0	0	0	0	0	0	0	0	1	2	0
<b>CO 3</b>	2.72	0	2	0	1	0	0	0	0	0	0	0	0	0	1	0
<b>CO 4</b>	2.80	2	2	1	0	0	0	0	0	0	0	0	0	1	0	2
<b>CO 5</b>	2.67	1	3	2	0	0	0	0	0	0	0	0	0	2	1	0
<b>CO 6</b>	2.70	2	1	3	0	0	0	0	0	0	0	0	0	1	2	0
<b>MWOC</b>		<b>2.71</b>	<b>2.66</b>	<b>2.66</b>	<b>2.72</b>	-	-	-	-	-	-	-	-	<b>2.67</b>	<b>2.64</b>	<b>2.80</b>

# OBE Philosophy of the Department contd....

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

Attained POs Semester wise: **AY 2022-23**

YEAR	Sem	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>Average of SET PO</b>		2.24	2.25	2.09	1.74	1.59	1.8	1.77	1.33	1.82	1.52	1.8	1.55	1.7	1.7	1.64
<b>II</b>	<b>I</b>	2.60	2.64	2.65	2.64	2.73	2.83	2.99	2.88	2.84	2.53	1.88	2.84	2.66	2.66	2.63
	<b>II</b>	2.61	2.65	2.64	2.60	2.65	2.79	2.82	2.82	2.80	2.80	2.82	2.58	2.59	2.57	2.59
<b>III</b>	<b>I</b>	2.91	2.90	2.91	2.91	2.95	2.98	2.92	2.87	2.93	2.98	2.97	2.94	2.91	2.89	2.92
	<b>II</b>	2.72	2.71	2.70	2.64	2.67	2.63	2.92	2.95	2.67	2.75	1.78	2.20	2.73	2.68	2.54
<b>IV</b>	<b>I</b>	2.75	2.79	2.77	2.70	2.93	2.87	2.84	2.86	2.86	2.39	0.00	2.78	2.75	2.73	2.61
	<b>II</b>	2.79	2.80	2.82	2.80	2.87	2.87	2.85	0.00	0.00	2.84	2.82	2.85	2.82	2.81	2.83

Attained POs Semester Wise: **AY 2021-22**

YEAR	Sem	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>Average of SET PO</b>		1.94	2.01	1.96	1.51	1.31	1.19	1.03	0.58	1.26	1.02	1.14	1.49	1.58	1.54	1.42
<b>II</b>	<b>I</b>	2.70	2.73	2.78	2.74	2.77	2.89	2.89	2.89	2.76	1.92	1.93	2.69	2.74	2.68	2.70
	<b>II</b>	2.89	2.89	2.90	2.86	2.91	2.79	2.74	2.74	2.89	2.81	2.89	2.83	2.90	2.88	2.88
<b>III</b>	<b>I</b>	2.69	2.67	2.70	2.70	2.58	3.00	2.85	2.36	2.75	3.00	2.75	2.61	2.88	2.68	2.64
	<b>II</b>	2.77	2.73	2.73	2.81	2.78	2.81	2.84	2.80	2.77	2.66	2.79	2.68	2.76	2.76	2.73
<b>IV</b>	<b>I</b>	2.68	2.67	2.62	2.81	2.91	2.82	2.78	0.00	0.00	2.91	2.81	2.79	2.66	2.64	2.67
	<b>II</b>	2.68	2.68	2.60	2.50	2.37	2.50	2.50	2.62	2.37	2.62	2.62	2.63	2.76	2.65	2.55



# OBE Philosophy of the Department contd....

## Attained POs Semester Wise: AY 2020-21

YEAR	Sem	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>Average of SET PO</b>		<b>2.08</b>	<b>2.10</b>	<b>1.93</b>	<b>1.93</b>	<b>1.77</b>	<b>1.65</b>	<b>1.91</b>	<b>1.67</b>	<b>1.75</b>	<b>1.68</b>	<b>1.68</b>	<b>1.53</b>	<b>1.68</b>	<b>1.72</b>	<b>1.51</b>
II	I	2.54	2.54	2.51	2.62	2.64	2.50	2.30	0.00	2.38	2.30	2.66	2.41	2.64	2.63	2.60
	II	2.61	2.63	2.56	2.50	2.70	0.00	0.00	0.00	2.58	0.00	2.71	2.60	2.57	2.57	2.58
III	I	2.76	2.73	2.76	2.63	2.79	2.63	2.81	2.62	2.73	2.77	2.84	2.82	2.76	2.75	2.75
	II	2.80	2.81	2.80	2.78	2.78	2.78	2.89	0.00	2.93	2.54	3.00	2.82	2.81	2.81	2.79
IV	I	2.78	2.77	2.75	2.76	2.83	2.77	2.74	0.00	0.00	2.82	2.72	2.71	2.76	2.78	2.76
	II	2.66	2.65	2.45	2.37	2.08	2.37	2.37	2.56	2.08	2.56	2.56	2.49	2.65	2.63	2.46

YEAR	Sem	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>Average of attained PO (2022-23)</b>		2.70	2.72	2.72	2.68	2.74	2.76	2.89	2.88	2.79	2.65	2.11	2.68	2.72	2.69	2.65
<b>Average of attained PO (2021-22)</b>		2.74	2.73	2.74	2.76	2.75	2.81	2.78	2.63	2.77	2.70	2.65	2.72	2.79	2.72	2.71
<b>Average of attained PO (2020-21)</b>		2.70	2.70	2.67	2.60	2.71	2.65	2.73	2.60	2.60	2.66	2.75	2.70	2.71	2.71	2.69

# OBE Philosophy of the Department contd....

**Actions taken based on the results of evaluation of each of the COs, POs & PSOs :**

## POs & PSOs Attainment Levels and Actions for improvement- CAY: 2021-22

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Set POs	1.94	2.01	1.96	1.51	1.31	1.19	1.03	0.58	1.26	1.02	1.14	1.49	1.58	1.54	1.42
Attained POs	2.74	2.73	2.74	2.76	2.75	2.81	2.78	2.63	2.77	2.70	2.65	2.72	2.79	2.72	2.71

YEAR	Sem	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
II	I	SS 2.33	SS 2.327	EDC 2.467	SS 2.3244	SS 2.336				SS 2.361			SS 2.335
	II	ARM MC&I 2.718	ARM MC&I 2.729	ARM MC&I 2.730	ARM MC&I 2.718		ARM MC&I 2.736	ARM MC&I 2.736	ARM MC&I 2.736	ARM MC&I 2.690	ARM MC&I 2.690	ARM MC&I 2.690	ARM MC&I 2.690
III	I	AWP 2.174	AWP 2.375	AWP 2.289	AWP 2.0591	CJP 2.234			AWP 2.032	AWP 2.032		CJP 2.738	CJP 2.489
	II	DSP 2.583	DSP 2.585	DSP 2.501	ARM MC&I 2.730	DSP 2.621	DC LAB 2.666	ARM MC&I 2.803		DC LAB 2.666	DSP 2.6217	DC LAB 2.666	DSP 2.485
IV	I	MW& OC 2.302	MW& OC 2.3025	CN 2.276		SC 2.841	CN 2.593	CN 2.593			SC 2.835	CN 2.75	DIP 2.486
	II	RS 2.632	RS 2.632	RS 2.367									

# Measures Taken To Improve POs' Attainment Levels

Pos	Target Level	Attainment Level	Observations
<b>PO1: Engineering knowledge</b>			
<b>Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems</b>			
PO1	1.94	2.74	<ul style="list-style-type: none"> <li>In related to PO1 during CAY, the following subjects have got least PO attainment level.</li> <li>SS(2.33),ARMMC&amp;I(2.718),AWP(2.174),DSP(2.583),MW&amp;OC(2.302),RS(2.632).</li> </ul>
<b>Action: Tutorial classes are offered for the students beyond the working hours to enhance their knowledge in application of TECHNICAL SUBJECTS.</b>			
<b>PO2: Problem analysis</b>			
<b>Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences</b>			
PO2	2.01	2.73	<ul style="list-style-type: none"> <li>In a course on problem analysis, the Student performance has been consistently low with respect to CORE SUBJECTS.</li> <li>As mentioned above the percentage of students who are passed the courses in relation with analytical skills using of TECHNICAL SUBJECTS AND are consistently low because of SOME students.</li> </ul>
<b>Action: Tutorial classes are offered for the THOSE students beyond the working hours to enhance their knowledge in analytical skills using of TECHNICAL SUBJECTS.</b>			
<b>PO3: Design/development of solutions</b>			
<b>Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consider action for the public health and safety, and the cultural, societal, and environmental considerations</b>			
PO3	1.96	2.74	<ul style="list-style-type: none"> <li>In a course design, the Student performance has been consistently moderate with respect to some CO's</li> <li>In relation to satisfy the MISSION statement continuous improvement in curriculum helped the students to attain Design/development of solutions</li> </ul>
<b>Action: In view of the need to design solutions for complex engineering problems, students are required to have their project work on proto type development to meet real time needs.</b>			

## OBE Philosophy of the Department contd....

Pos	Target Level	Attainment Level	Observations
<b>PO4: Conduct investigations of complex problems:</b> 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			
PO4	1.51	2.76	<ul style="list-style-type: none"> <li>In a course experiment and complex problems, the Student performance has been satisfied.</li> </ul>
<b>Action: To keep improve the attainment level, laboratories are remains open beyond working hours.</b>			
<b>PO5: Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations			
PO5	1.31	2.75	<ul style="list-style-type: none"> <li>Attainment level is satisfactory because of the availability of the modern tools such as, MATLAB, PSICE, VTCAD and CADENCE</li> </ul>
<b>Action: To keep the attainment level with the help of revised regulations the programme has adequate IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations</b>			
<b>PO6: The engineer and society</b> 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			
PO6	1.19	2.81	<ul style="list-style-type: none"> <li>Attain level is moderate with lagging in ET LAB &amp; MPMC which emphasis on analytical skills.</li> </ul>
<b>Action: To improve the attainment level, tutorial classes are offered beyond the working hours to enhance their knowledge in analytical skills</b>			

## OBE Philosophy of the Department contd....

Pos	Target Level	Attainment Level	Observations
<b>PO7: Environment and sustainability</b>			
<b>Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development</b>			
<b>PO7</b>	<b>1.03</b>	2.78	<ul style="list-style-type: none"> <li>Attainment level is satisfactory due to alignment with the third vision statement that specifies TO DEVELOP INDIGENOUS AND APPROPRIATE TECHNOLOGIES AT LOW COST TO HELP THE RURAL PEOPLE.</li> </ul>
<b>Action: To improve attainment level conducting visits to villages and students are doing community service projects for sustainability.</b>			
<b>PO8: Ethics</b>			
<b>Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice</b>			
<b>PO8</b>	<b>0.58</b>	2.63	<ul style="list-style-type: none"> <li>Attainment level is satisfactory due to alignment with mission and THIRD vision.</li> </ul>
<b>Action: To keep attainment level various guest lectures on professions ethics is conducting in regular basis.</b>			
<b>PO9: Individual and Team Work</b>			
<b>Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings</b>			
<b>PO9</b>	<b>1.26</b>	2.77	<ul style="list-style-type: none"> <li>Attainment level is obtained with the constant steps that are included during regular laboratory hours and project work</li> </ul>
<b>Action: To improve attainment level lab hours are increased and conducting investigation on projects by reviews.</b>			

# OBE Philosophy of the Department contd....

Pos	Target Level	Attainment Level	Observations
<b>PO10: Communication</b>			
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			
PO10	1.02	2.70	<ul style="list-style-type: none"> <li>Attainment level is satisfactory with involvement of English language and communications language skills lab (ELCS LAB).</li> </ul>
Action: To improve attainment level conducting group discussions and JAM (Just A Minute) sessions to improve the vocabulary of students.			
<b>PO11: Project Management and Finance</b>			
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			
PO11	1.14	2.65	<ul style="list-style-type: none"> <li>In a course of project in multidisciplinary environments, the student performance has been consistently moderate with respect to some CO's</li> </ul>
Action: In order to have continuous improvement and individual involvement size of project batch has been reduced from 5 to 4 members.			
<b>PO12: Life-long learning</b>			
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			
PO12	1.49	2.72	<ul style="list-style-type: none"> <li>Attainment level is satisfactory</li> </ul>
Action: In order to achieve continuous improvement, various guest lectures, seminars and workshops are organized in regular intervals to meet the ability of life- long learning in the broadest context of technological change.			

# OBE Philosophy of the Department contd....

## PSOs Attainment Levels and Actions for Improvement-A.Y 2019-20

PSOs	Target Level	Attainment Level	Observations
<b>PSO 1:</b>			
Students are able to analyze and design the electronic circuits with the knowledge of courses related circuits, Networks, Linear digital circuits and Analog electronics.			
PSO 1	1.58	2.79	Attainment level is satisfactory
Action: In order to achieve continuous improvement, concentrated on lab hours for increasing the knowledge of the students related to different circuit designs.			
<b>PSO 2:</b>			
Student can explore the scientific theories, ideas, methodologies in operation and maintenance of communication systems to bridge the gap between academics and industries.			
PSO 2	1.54	2.72	Attainment level is satisfactory
Action: In order to achieve continuous improvement, various guest lectures, seminars and workshops are organized on Professional Ethics and Soft Skills to bridge the gap between academics and industries.			
<b>PSO 3:</b>			
Students are able to work professionally with new cutting edge technologies in the fields of electronic design, communication and automation.			
PSO 3	1.42	2.71	Attainment level is satisfactory
Action: In order to achieve continuous improvement, various guest lectures, seminars and workshops are organized in regular intervals with industry people who are working in core companies to increase the knowledge of the student and also to cope up with the new technologies.			

# OBE Philosophy of the Department contd....

## Stakeholders Involvement in the Process of Improvement of PEOs and POs:

### Overall PO attainment:

For all the 4 years = Average of individual POs over all the Courses during the 4 years

The logic behind this method introduced is that students will achieve Program Outcome if only they achieve the associated Course Outcomes.

All have to agree on the thresholds or scores that will constitute achieving the Course Outcome and Program Outcome. In this example, the set level is that 50% of students get 60% overall mark in order to say the Course Outcome is achieved. Each individual student has to get at least 60% of marks associated with the Course Outcome to be achieved.

Closing the Loop: Reasons for CO non-attainment are to be listed and measures for improvement (say, training the students to solve more design-analysis oriented problems and applications in certain Engineering subjects) of course delivery and problem-solving are to be recorded and implemented. Results will show definite improvements in CO attainment and hence PO attainments

Placements & Higher Studies	
% Placements	PO & PSO Attainment Level
> 50%	3
Between 30% to 50%	2
< 30%	1

### Exit Survey

	Response(i)	Weights(WESRi or WASRi)
Each PO or PSO	Excellent	3
	Very Good	2.5
	Good	2.0
	Satisfactory	1.0
	Not Satisfactory	0

### Student Survey:

	Response(i)	Weights(WESRi or WASRi)
Each PO or PSO	Excellent	3
	Very Good	2.5
	Good	2.0
	Satisfactory	1.0
	Not Satisfactory	0

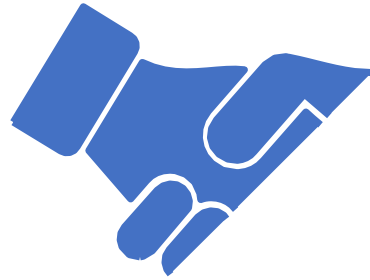
### Alumni Survey

	Response(i)	Weights(WESRi or WASRi)
Each PO or PSO	Excellent	3
	Very Good	2.5
	Good	2.0
	Satisfactory	1.0
	Not Satisfactory	0

### Industry & Parent Survey :

	Response(i)	Weights(WESRi or WASRi)
Each PO or PSO	Excellent	3
	Very Good	2.5
	Good	2.0
	Satisfactory	1.0
	Not Satisfactory	0





Thank you