

Criterion 2: Teaching Learning and Evaluation

2.6.2 Attainment of POs and COs are evaluated

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Sarvasiddhanta Education Society's

Swaminarayan Siddhanta Institute of Technology

Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University

Nagpur-Katol Highway Road, Khapri (Kothe),

Tal: Kalmeshwar, Nagpur, Maharashtra-441501



CO-PO/PSO Attainment & Evaluation, Guidelines


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Dist. Nagpur 441501



A key component of our educational system at Swaminarayan Siddhanta Institute of Technology, Nagpur has been the implementation of Outcome Based Education (OBE). OBE is a theory of education in which each part of an educational system revolves around objectives (outcomes).

Manual describes how the Institute assesses students' learning and development to improve student learning. Through this process, students identify what they know, value, and can do as a result of their academic and co-curricular experiences at the Institute by gathering, analysing, and discussing information from various sources. Additionally, the assessment process contributes to continuous improvement of the program and to effectively achieving the Institute's goals.

The definitions of various aspects of Outcome Based Education (OBE) viz Program Outcomes (POs), Program Specific Outcomes (PSOs) and Course Outcomes(COs) are:

1. POs/ PSOs/COs

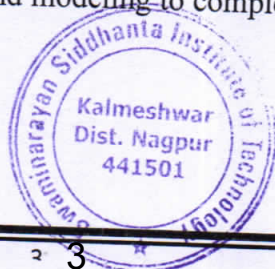
1.1 PROGRAM OUTCOMES (POs)

The program outcomes describe what students are expected to know and be capable of by the time they graduate. As a result of their matriculation and participation in the program, students acquire the following skills, knowledge, and behaviours

Twelve Program Outcomes specified by the National Board of Accreditation and adopted by the Institute are as follows:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an 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.

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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 multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
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.

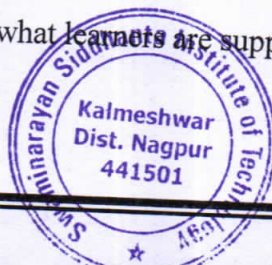
1.2 PROGRAM SPECIFIC OUTCOMES (PSOs)

- PSOs are statements that identify what students should be able to do upon graduation from an engineering program.
- Each department frame its own PSOs.
- It should be in the range of 2-4.

1.3 COURSE OUTCOMES (COs)

- Course Outcomes are the statement defined by university or by the subject expert of the department and approved by head of department.
- Course Outcomes (Learning Outcomes) are statements that states what learners will be able learn after the completion of that particular course (subject). Outcomes are usually expressed as knowledge, skills or attitudes.
- The purpose of Course outcomes are used to show what learners are supposed to achieve and how they are expected to demonstrate that achievement.

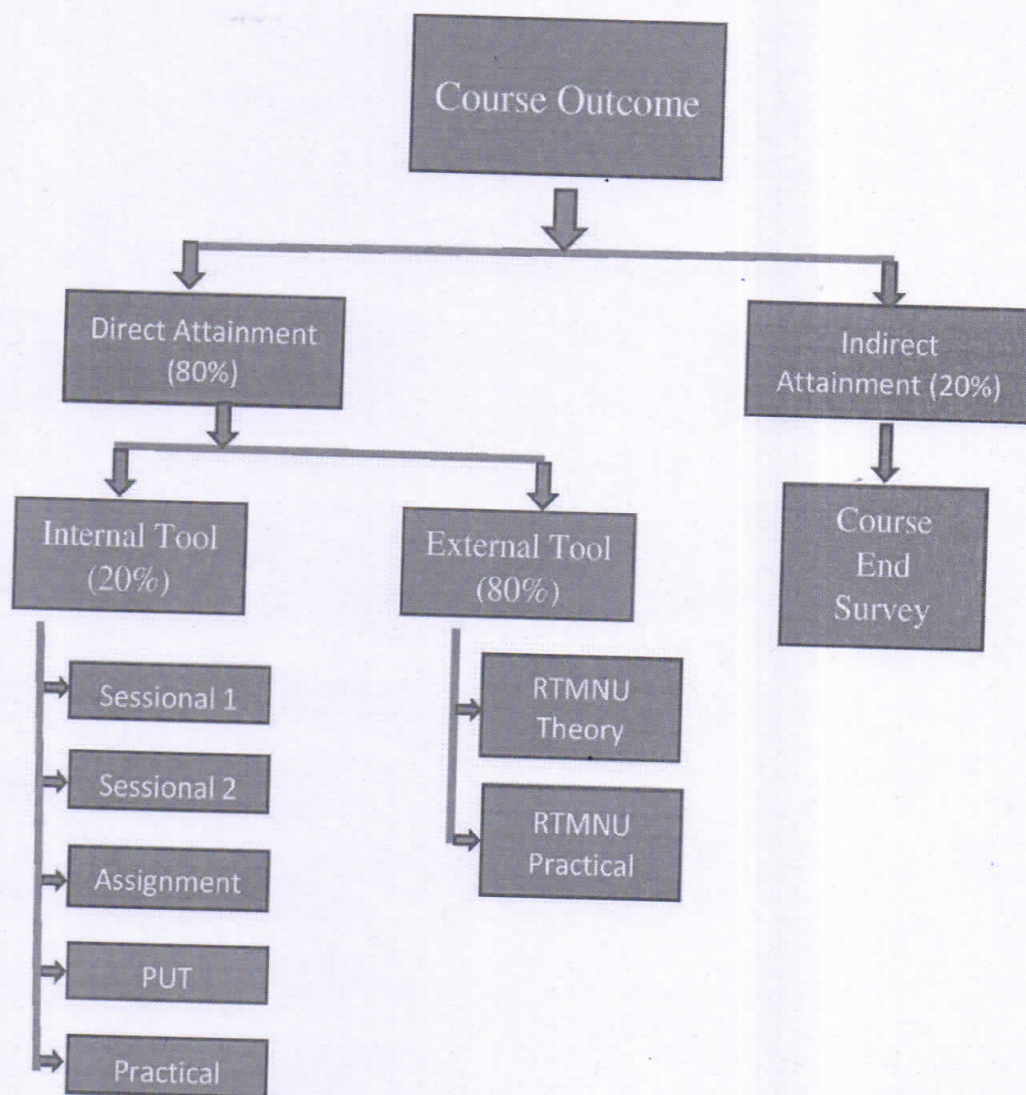
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- Also, the Course Outcomes (COs) (**Theory & Practical**) are mapped with Program Outcomes wherever it is relevant.
- Course Outcome of Course (**Practical**) is designed considering the knowledge and skills acquired by the students by the performance of respective course practical.

2. ATTAINMENT TOOLS

2.1 CO Attainment (THEORY & PRACTICAL):



2.2 Attainment of Course Outcomes (COs)

- Attainment of COs can be measured directly and indirectly
- Direct attainment of COs can be determined from the performances of students in all the relevant assessment instruments Continuous assessment of theory: Progressive test and Assignments, Term End Examination of Theory, Continuous assessment of practical: Skill

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assessment and Record keeping (Journal Writing/ drawing sheets etc.) and Term End Examination of Practical

- Indirect attainment of COs can be determined from the course exit surveys.
- Percentage weightage for computation of direct attainment of COs should be 80 % which consist of:
 - Continuous assessment of theory: Progressive test and Assignments
 - Term End Examination of Theory
 - Continuous assessment of practical: Skill assessment and Record keeping (Journal Writing/ Drawing sheet etc.)
 - Term End Examination of Practical
- Percentage weightage for computation of indirect attainment of COs should be 20 % which consist of:
 - End of Course survey

2.2.1 Method of Direct CO attainment

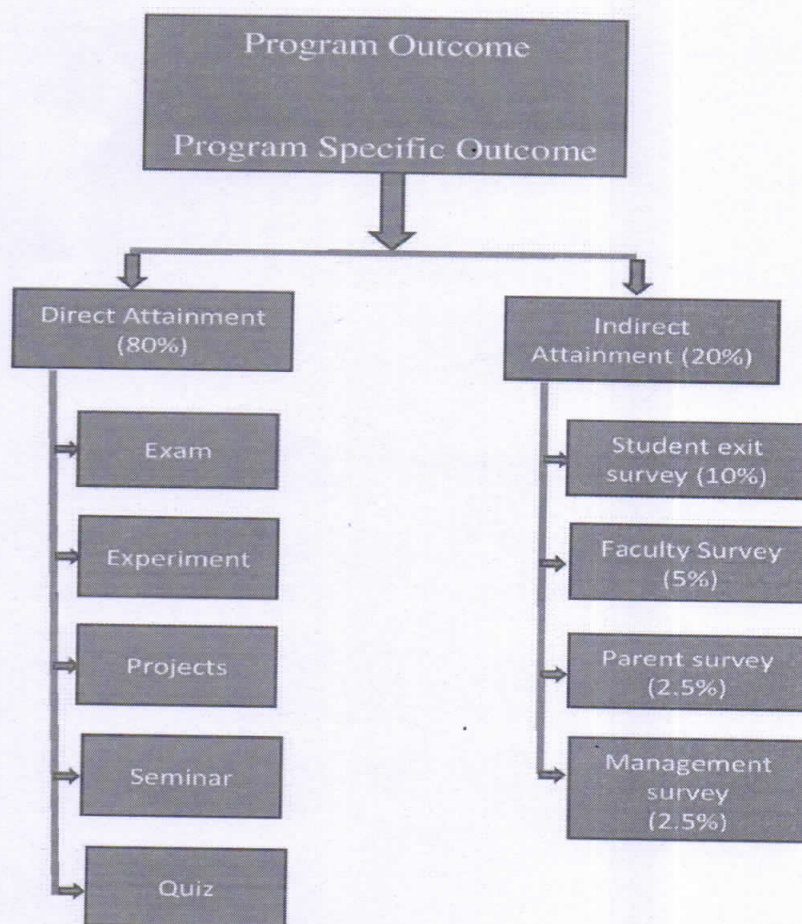
- The Program/Department will have access continuous assessment of Theory (Progressive test and assignment) and continuous assessment of practical. Term End Theory and Practical examination is conducted and evaluated by examination cell and University.
- Average percentage of each COs should be calculated for continuous assessment of Theory (Progressive test and assignment) and continuous assessment of practical.
- Faculty should use MS Excel Program (*CO_Attainment*) prepared for calculation of CO attainment.

2.2.2 Setting targets for Course Outcomes and identification of attainment gap

- Targets are set for each COs of a course separately.
- Setting target has the advantage of finding out the difficulty of specific COs.
- Attainment gap is identified by comparing CO attainment and setting target.
- Suitable action is initiated to fill the gap at the course faculty level and the same is documented.
- If the target achieved, higher target is set.

2.3 Attainment of Program Outcomes (POs) and Program Specific Outcomes (PSO)

- POs and PSOs are attained through program specific Core Courses.
- Each Course addresses a sub-set of POs and PSOs to varying levels (strengths) (1, 2 or 3).
- COs have to be written to meet the identified POs/PSOs.



2.3.1 Strength of CO-PO/PSO Mapping

- Attainment of a PO/PSO depends both on the attainment levels of associated COs and the strength to which it is mapped
- To determine the level (mapping strength) a particular PO/PSO is addressed by the course.
- Strength of mapping is defined at three levels: Low (1), Medium (2) and Strong (3)

2.3.2 Method to relate level of PO/PSO

- A following method is to relate the level of PO/PSO with the number of hours devoted to the COs which address the given PO/PSO.
- If >40% of classroom sessions addressing a particular PO/PSO, it is considered that PO/PSO is addressed at Level 3
- If 25 to 40% of classroom sessions addressing a particular PO/PSO, it is considered that PO/PSO is addressed at Level 2
- If 5 to 25% of classroom sessions addressing a particular PO/PSO, it is considered that PO/PSO is addressed at Level 1
- If < 5% of classroom sessions addressing a particular PO/PSO, it is considered that PO/PSO is considered not-addressed (Means 0 or "-")

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- COs-POs and PSOs mapping is mentioned in individual curriculum.

2.3.3 POs/PSOs Attainment Method

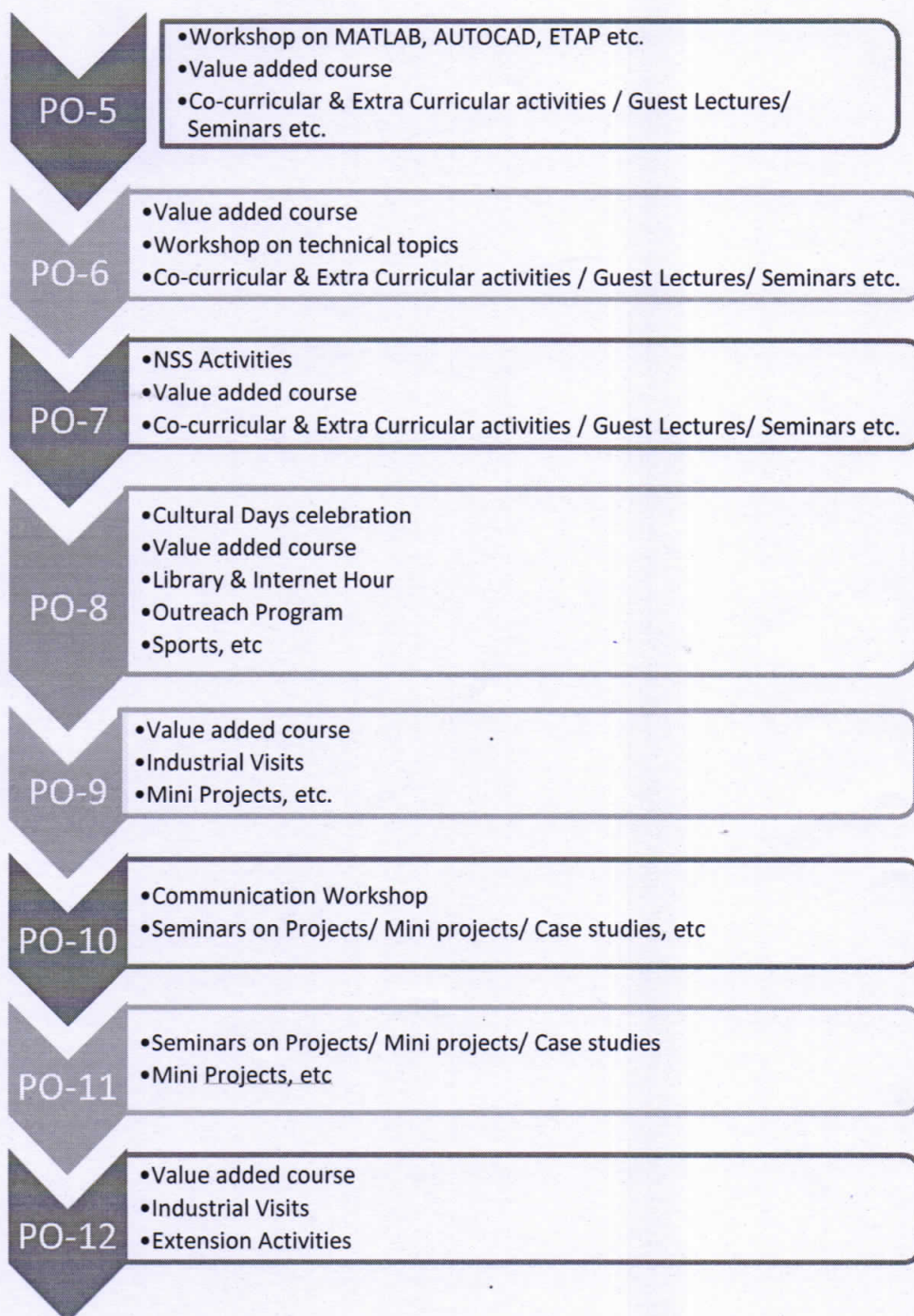
- PO/PSO attainment are calculated using following formula-

PO/PSO attainment= Mapping strength of PO/PSO x Average of CO attainment addressing the particular PO/PSO

- These computations are approximate but indicative PO/PSO attainment
- Evaluations of attainment of POs and PSOs based on Direct and Indirect Methods are combined to arrive at the Final Evaluation.
- Combined Evaluation= (Weightage of direct attainment x Attainment value) + (Weightage of indirect attainment x Attainment value).
- Typical values of weight age of **direct and indirect attainment** are 0.8 and 0.2 respectively.
- **Values of indirect attainment are calculated from feedback system as follows:**
 - Student Exist Survey (10%)
 - Faculty Survey: (5%)
 - Parent Survey: (2.5%)
 - Management Survey: (2.5%)
- Use MS Excel Program (*CO_Attainment*) for finding PO/PSO attainment.

PO1 –PO4	PO5-PO12
Direct Attainment (80%)	Direct Attainment (40%)
Indirect Attainment (20%) <ul style="list-style-type: none"> • Student Exist Survey (10%) • Faculty Survey: (5%) • Parent Survey: (2.5%) • Management Survey: (2.5%) 	Indirect Attainment (20%) <ul style="list-style-type: none"> • Student Exist Survey (10%) • Faculty Survey: (5%) • Parent Survey: (2.5%) • Management Survey: (2.5%)
Additional Activities (0%)	Additional Activities (40%)

2.3.4 Additional Activities for Attainment of PO5-PO12



2.4 Attainment of Program Educational Objectives (PEOs)

- Attainment of PEOs based on attainment of POs and Indirect Methods.
- Combined Evaluation= (Weight age of direct attainment x Attainment value of POs) + (Weight age of indirect attainment x Attainment value from feedback)
- Typical values of weight age of direct, indirect attainment and additional activities are 0.7, 0.2 and 0.1 respectively.

- Values of indirect attainment are calculated from feedback system as follows:

- Industry Survey: 10%
- Alumni Survey: 10%

PSO-1,2, 3
Direct Attainment (70%)
Indirect Attainment (20%) <ul style="list-style-type: none">• Industry Survey: 10%• Alumni Survey: 10%
Additional Activities (10%)


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Session:

Course Outcomes Attainment Gap Analysis

(Sem:)

Name of Program/ Dept.:

Course Code: Course Name:

Name of Faculty:

Course Outcomes (COs)	COs Target in %	COs Attainment in %	COs Attainment Gap in %	Action Proposed to bridge the Gap	Modification
CO1					
CO2					
CO3					
CO4					
CO5					
CO6					

Name & Sign of Course Faculty

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Session:

Course Outcomes Attainment

(Sem:)


Name of Program/ Dept.:

Course Code: Course Name:

Name of Faculty:

Assessment Tool		Course Outcomes (COs) Attainment in %					
		CO1	CO2	CO3	CO4	CO5	CO6
Internal Tool	Progressive Test-1						
	Progressive Test-2						
	Assignment						
	Pre University Test						
	Continuous Assessment Practical						
External Tool	Theory University Score						
	Practical University Score						
Direct CO attainment (20% of Internal Tool + 80% of External Tool)							
Indirect CO attainment from feedback							
CO attainment (80% of Direct+20% of Indirect)							

Name & Sign of Course Faculty


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Session:

COURSE END FEEDBACK

Subject:

Dear Student,

The purpose of this survey is to obtain input from the students, for assessment the Course Outcomes (COs). As a student of (Name of program) program at Swaminarayan Siddhanta Institute of Technology, Nagpur. We seek your help in completing this survey. Your response is a key part of our continuous improvement process. Your participation is greatly appreciated.

Please insert ✓ in the appropriate box to indicate the degree of your satisfaction level.

1: Poor, 2: Good, 3: Excellent

S.N.	Course Outcomes (COs)	1	2	3
1				
2				
3				
4				
5				
6				

Any other suggestions: How to improve? / Any other comments.

.....
.....

Signature:


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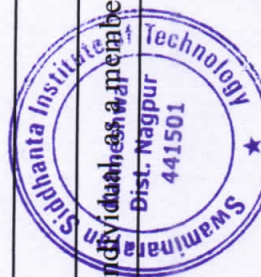
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Department of Electronics & Telecommunication Engineering

Course Outcomes

Subject :Component for Electronic Circuit Design		Subject Code:BEETC-302T/BEEN-302T/BEEEC-302T	Class: 3rd sem
CO1	Understand the principles of semiconductor physics.		
CO2	Understand the principles of semiconductor diode.		
CO3	Understand and analyze the mathematical model of transistors.		
CO4	Understand and analyze the mathematical model of unipolar transistors.		
CO5	Understand the process of Integrated Circuit Fabrication.		

PROGRAM OUTCOME (PO)	
PO1	Engineering knowledge: An ability to apply knowledge of mathematics, science, and engineering fundamentals.
PO2	Problem analysis: An ability to identify, formulates, and solves complex engineering problems.
PO3	Design/development of solutions: An ability to design a system, component, or process to meet desired needs with appropriate considerations such as economic, environmental, social, political, ethical, health and safety.
PO4	Conduct investigations of complex problems: An ability to design and conduct experiments, as well as to analyze and interpret data.
PO5	Modern tool usage: An ability to use the techniques, skills, and modern engineering & computational tools necessary for engineering practice.
PO6	The engineer and society: The broad education necessary to understand the impact of contextual knowledge on social, health, safety, legal and cultural issues.
PO7	Environment and sustainability: An ability to understand contemporary issues related to social & environmental context for sustainable development of engineering solutions.
PO8	Ethics: An understanding of professional & ethical responsibility.
PO9	Individual and team work: An ability to function effectively as an individual as well as a member or leader in diverse & multidisciplinary teams



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PO10	Communication: An ability to communicate effectively.
PO11	Project management and finance: An understanding of engineering & management principles to manage projects.
PO12	Life-long learning: A recognition of the need for, and an ability to engage in lifelong learning.

Program Specific Outcomes (PSO)

The graduates of the department will attain ability to:

PSO1	Graduate will be able to identify, analyze & solve the problems related to Electronics and Telecommunication Engineering by applying the fundamental knowledge of Electronics and Communication.
PSO2	Graduate will demonstrate an ability to investigate, design and develop both software and hardware using significant knowledge of modern tools in Electronics and Telecommunication Engineering.
PSO3	Graduate will be able to apply their knowledge to assess societal, environmental, health, safety issues with professional ethics and can also pursue higher studies, involve in research activities, be employable or entrepreneur.

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Mapping of CO -PO

CO-PO Correlation		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1		3	3	2							1		3	3	3	3
CO2		3	3	3	2						1		3	3	3	3
CO3		3	3	2	2						1		3	3	3	3
CO4		3	3	3	2						1		3	3	3	3
CO5		3	2								1		3	3	3	3
Co Average		3.00	2.80	2.50	2.00						1.00		3.00	3.00	3.00	3.00


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Mapping of CO -PO

CO-PO Correlation		Program Outcomes												Program Specific Outcomes		
Course																
Outcome		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1		3	3	2							1		3	3	3	3
CO2		3	3	3	2						1		3	3	3	3
CO3		3	3	2	2						1		3	3	3	3
CO4		3	3	3	2						1		3	3	3	3
CO5		3	2								1		3	3	3	3
Co Average		3.00	2.80	2.50	2.00						1.00		3.00	3.00	3.00	3.00




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ROLL NO.	Name of Students	Question No.	CO1																									CO2					
			CO1																									CO2					
			CO1																									CO2					
			CO1																									CO2					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total	Final Marks (30)	CO Attained	Total of Marks Obtained	Total of Marks	CO Attained			
1	ACHAL NILKANTHA HAJARE	1	1	0	1	1	1	0	1	0	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1	18	8	12	1	10	13	1	
2	ANKIT SADANAND KUSHWAHA	1	1	0	1	0	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	1	1	0	1	16	16	7	12	0	9	13	1
3	APEKSHA SANJAY NANDURKAR	0	1	1	0	1	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	0	0	1	18	18	9	12	1	9	13	1
4	ASHWAJIT DADARAO NARANJE	1	0	1	0	1	0	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	18	18	7	12	0	11	13	1
5	CHANCHAL KOMAL NAVGHARE	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	0	1	20	20	11	12	1	9	13	1
6	DEEPAK CHAITRAM BAWANKULE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	22	20	12	12	1	10	13	1
7	HARSHAL GAJENDRA KHADASE	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	0	0	1	1	0	1	18	18	11	12	1	7	13	0
8	MANGESH PRABHAKAR SHRIRAO	1	1	0	1	0	1	1	0	1	1	1	0	1	1	0	1	1	1	0	1	1	1	0	1	18	18	8	12	1	10	13	1
9	MAYURI KAWDUJI MARASKOLHE	1	1	1	1	0	1	1	0	1	1	1	0	1	1	0	1	1	0	0	0	1	1	1	1	18	18	10	12	1	8	13	1
10	MOHD MOIN IMRAN AHMAD	1	0	1	0	1	1	1	0	1	0	1	0	1	1	1	0	1	1	0	1	1	1	0	1	16	16	7	12	0	9	13	1
11	K NANDINI RAO	0	1	1	1	0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1	0	1	18	18	9	12	1	9	13	1
12	NITESH DEWAJI KAMBALE	1	0	1	0	0	1	0	1	1	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1	16	16	7	12	0	9	13	1
13	PAYAL NAROTTAM MESHRAM	1	1	1	0	0	1	1	1	1	1	0	0	1	1	1	1	1	1	0	1	1	0	0	1	18	18	8	12	1	10	13	1
14	SAI SHRIDHAR BACHHAV	1	1	0	0	0	1	1	1	0	1	1	0	1	1	0	1	1	1	1	1	1	1	0	1	18	18	7	12	0	11	13	1
15	SHANTANU HARIBHAU TALMALE	1	1	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	0	1	0	0	1	0	0	16	16	8	12	1	8	13	1
16	SHASHANK JAWAHAR GAJBHIYE	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	0	1	0	18	18	9	12	1	9	13	1
17	SURAJ RAJESH TAYADE	1	0	1	1	1	0	1	0	1	1	1	0	1	1	1	1	0	1	0	1	1	1	0	1	18	18	8	12	1	10	13	1
18	TARAFDAR KUNDAN KINGKAR	1	1	1	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	0	1	1	0	0	0	18	18	10	12	1	8	13	1
19	VAISHNAVI SUDHAKAR SAKINALA	1	1	1	0	1	1	0	0	1	1	0	1	1	1	1	1	1	1	1	0	0	1	0	1	18	18	8	12	1	10	13	1
20	YASH SANJAY DHAIBEKAR	0	1	1	1	0	1	0	1	1	1	0	1	1	1	1	1	1	0	0	1	1	1	0	1	18	18	8	12	1	10	13	1
			Number Students Scoring more than 60 % Marks																									15		19			
			Number of Students Attempting CO related Question																									20		20			
			Percentage of Students Scoring More than 60 % Marks																									75		95			

CO	% of students successfully attaining		the CO		LEVEL	
CO-1	75.00				2	
CO-2	75.00				3	
CO-3						
CO-4						
CO-5						

If 80 percent Students scoring more 60 percent write -3 (High)
 If 70 percent Students scoring more 60 percent write -2 (Medium)
 If 60 percent Students scoring more 60 percent write -1 (LOW)
 If less 60 percent Students scoring more 60 percent write -0 (NOT ATTAINED)

Swaminarayan Siddhanta Institute of Technology, Nagpur																											Attainment of COs In Sessional II Examination									
ELECTRONICS & TELECOMMUNICATION ENGINEERING																											Session:-2021-22					Sem:-III				
Subject:- Component for Electronic Circuit Design																											Subject Code:- BEETC-302T/BEEN-302T/BEEC-302T									
ROLL NO.	Name of Students	Question No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total	Final Marks (20)	CO3		CO4				
		Max. Marks	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3	CO3			CO3	Total of Marks Obtained	CO Attained	Total of Marks Obtained	CO Attained		
		CO's Mapped																																		
1	ACHAL NILKANTHA HAJARE		1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	15	15	9	13	1	6	12	0	
2	ANKIT SADANAND KUSHWAHA		0	0	1	1	0	1	1	0	1	1	0	1	1	1	1	0	1	0	1	1	1	1	1	1	1	16	16	8	13	1	8	12	1	
3	APEKSHA SANJAY NANDURKAR		1	1	1	1	1	0	1	0	0	1	0	0	0	1	1	1	1	0	1	1	1	1	1	1	1	15	15	7	13	0	8	12	1	
4	ASHWAJIT DADARAO NARANJE		1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	18	18	9	13	1	9	12	1	
5	CHANCHAL KOMAL NAVGHARE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	25	20	13	13	1	12	12	1	
6	DEEPAK CHAITRAM BAWANKULE		1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22	20	11	13	1	11	12	1	
7	HARSHAL GAJENDRA KHADASE		0	1	1	0	1	0	1	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	1	15	15	7	13	0	8	12	1	
8	MANGESH PRABHAKAR SHRIRAO		1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	18	18	10	13	1	8	12	1	
9	MAYURI KAWDUJI MARASKOLHE		0	1	1	1	1	0	0	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	18	18	9	13	1	9	12	1	
10	MOHD MOIN IMRAN AHMAD		0	1	1	0	0	0	1	0	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	15	15	5	13	0	10	12	1	
11	K NANDINI RAO		1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	0	1	0	1	1	0	0	1	1	1	15	15	10	13	1	5	12	0	
12	NITESH DEWAJI KAMBALE		0	1	1	1	0	0	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	16	16	9	13	1	7	12	0	
13	PAYAL NAROTTAM MESHRAM		0	1	1	1	1	0	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	18	18	8	13	1	10	12	1	
14	SAI SHRIDHAR BACHHAV		1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	18	18	11	13	1	7	12	0	
15	SHANTANU HARIBHAU TALMALE		1	1	1	1	0	0	0	0	1	1	0	1	0	1	1	1	0	1	0	1	1	1	1	1	1	18	18	11	13	1	8	12	1	
16	SHASHANK JAWAHAR GAJBHIYE		1	1	0	0	0	1	0	1	0	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	16	16	8	13	1	8	12	1	
17	SURAJ RAJESH TAYADE		1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	0	1	0	1	1	0	1	1	1	1	14	14	8	13	1	6	12	0	
18	TARAFDAR KUNDAN KINGKAR		1	1	1	1	1	0	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	18	18	8	13	1	10	12	1	
19	VAISHNAVI SUDHAKAR SAKINALA		0	1	1	0	1	0	0	0	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	18	18	7	13	0	11	12	1	
20	YASH SANJAY DHABEKAR		0	1	1	0	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	18	18	10	13	1	8	12	1	
Number Students Scoring more than 60 % Marks																											16		15							
Number of Students Attempting CO related Question																											20		20							
Percentage of Students Scoring More than 60 % Marks																											80		75							

CO	% of students successfully attaining the CO	LEVEL
CO-1		
CO-2		
CO-3	80	3
CO-4	75	2
CO-5		

If 80 percent Students scoring more 60 percent write -3 (High)
If 70 percent Students scoring more 60 percent write -2 (Medium)
If 60 percent Students scoring more 60 percent write -1 (LOW)
If less 60 percent Students scoring more 60 percent write -0 (NOT ATTAINED)



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Subject/Sem : Component for Electronic Circuit Design/3rd

Assignment Maximum Marks =10					
Sr. No.	Name	Assignment 1	Assignment 2	Assignment 3	Average out of 10
Course Outcome		1,2	3,4	5	
1	ACHAL NILKANTHA HAJARE	9	10	10	10
2	ANKIT SADANAND KUSHWAHA	10	9	10	10
3	APEKSHA SANJAY NANDURKAR	9	10	10	10
4	ASHWAJIT DADARAO NARANJE	9	10	10	10
5	CHANCHAL KOMAL NAVGHARE	9	10	10	10
6	DEEPAK CHAITRAM BAWANKULE	10	10	10	10
7	HARSHAL GAJENDRA KHADASE	10	10	9	10
8	MANGESH PRABHAKAR SHRIRAO	8	8	8	8
9	MAYURI KAWDUJI MARASKOLHE	10	9	10	10
10	MOHD MOIN IMRAN AHMAD	10	9	10	10
11	K NANDINI RAO	10	10	10	10
12	NITESH DEWAJI KAMBALE	10	10	10	10
13	PAYAL NAROTTAM MESHARAM	9	10	10	10
14	SAI SHRIDHAR BACHHAV	10	9	10	10
15	SHANTANU HARIBHAU TALMALE	10	10	10	10
16	SHASHANK JAWAHAR GAJBHIYE	10	9	10	10
17	SURAJ RAJESH TAYADE	10	10	10	10
18	TARAFDAR KUNDAN KINGKAR	10	10	9	10
19	VAISHNAVI SUDHAKAR SAKINALA	10	9	10	10
20	YASH SANJAY DHABEKAR	9	10	10	10
Average		9.60	9.60	9.80	9.67
Course Outcome		1,2	3,4	5,6	
Percentage CO Attainment		96.00	96.00	98.00	96.67

Analysis	Assignment 1	Assignment 2	Assignment 3
Course Outcomes	1,2	3,4	5,6
Maximum Marks	10	10	10
Average	9.60	9.60	9.80
CO Attainment in %	96.00	96.00	98.00

Average CO attainment	CO1	CO2	CO3	CO4	CO5
	96.00	96.00	96.00	96.00	98.00

CO	% of students successfully attaining the CO	LEVEL
CO-1	96.00	3
CO-2	96.00	3
CO-3	96.00	3
CO-4	96.00	3
CO-5	98.00	3

If 80 percent Students scoring more 60 percent write -3 (High)
If 70 percent Students scoring more 60 percent write -2 (Medium)
If 60 percent Students scoring more 60 percent write -1 (LOW)
If less 60 percent Students scoring more 60 percent write -0 (NOT ATTAINED)

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Swaminarayan Siddhanta Institute of Technology, Nagpur										Attainment of COs In PUT														
Electronics & Telecommunication Engineering										Sem:-III														
Session:-2021-22										Subject Code:- BEETC-302T/BEEN-302T/BEEC-302T														
Subject:- Component for Electronic Circuit Design																								
ROLL NO.	Name of Students	Question No.	01-08	09-16	17-24	25-32	33-40	Total (80)	Final Marks (%)	CO1			CO2			CO3			CO4			CO5		
		Max. Marks	CO1	CO2	CO3	CO4	CO5			Total of Marks Obtained	Total of Marks	CO Attained	Total of Marks Obtained	Total of Marks	CO Attained	Total of Marks Obtained	Total of Marks	CO Attained	Total of Marks Obtained	Total of Marks	CO Attained	Total of Marks Obtained	Total of Marks	CO Attained
1	ACHAL NILKANTHA HAJARE		14	12	8	16	16	66	66	14	16	1	12	16	1	8	16	0	16	1	16	16	1	
2	ANKIT SADANAND KUSHWAHA		16	16	8	8	10	58	58	16	16	1	16	16	1	8	16	0	8	0	10	16	1	
3	APEKSHA SANJAY NANDURKAR		16	14	14	16	16	76	70	16	16	1	14	16	1	14	16	1	16	1	16	16	1	
4	ASHWAJIT DADARAO NARANJE		14	12	8	16	12	62	62	14	16	1	12	16	1	8	16	0	16	1	12	16	1	
5	CHANCHAL KOMAL NAVGHARE		16	12	16	12	8	64	64	16	16	1	12	16	1	16	16	1	12	16	1	8	16	0
6	DEEPAK CHATRAM BAWANKULE		12	12	10	8	14	56	56	12	16	1	12	16	1	10	16	1	8	16	0	14	16	1
7	HARSHAL GAJENDRA KHADASE		10	6	12	8	10	46	46	10	16	1	6	16	0	12	16	1	8	16	0	14	16	1
8	MANGESH PRABHAKAR SHIRAO		12	10	8	8	10	48	48	12	16	1	10	16	1	8	16	0	8	16	0	10	16	1
9	MAYURI KAWDUJI MARASKOLHE		12	10	16	14	12	64	64	12	16	1	10	16	1	16	16	1	14	16	1	12	16	1
10	MOHD MOIN IMRAN AHMAD		14	12	14	8	8	56	56	14	16	1	12	16	1	14	16	1	8	16	0	8	16	0
11	K NANDINI RAO		16	12	14	8	12	62	62	16	16	1	12	16	1	14	16	1	8	16	0	12	16	1
12	NITESH DEWAJI KAMBALE		8	8	14	12	14	56	56	8	16	0	8	16	0	14	16	1	12	16	1	14	16	1
13	PAYAL NAROTTAM MESHRAM		12	12	14	8	16	62	62	12	16	1	12	16	1	14	16	1	8	16	0	16	16	1
14	SAI SHRIDHAR BACHHAV		6	16	14	8	12	56	56	6	16	0	16	16	1	14	16	1	8	16	0	12	16	1
15	SHANTANU HARIBHAU TALMALE		12	6	14	10	16	58	58	12	16	1	6	16	0	14	16	1	10	16	1	16	16	1
16	SHASHANK JAWAHAR GAJBHIYE		12	14	10	10	14	60	60	12	16	1	14	16	1	10	16	1	10	16	1	14	16	1
17	SURAJ RAJESH TAYADE		8	8	14	12	14	56	56	8	16	0	8	16	0	14	16	1	12	16	1	14	16	1
18	TARAFDAR KUNDAN KINGKAR		8	10	10	12	10	50	50	8	16	0	10	16	1	10	16	1	12	16	1	10	16	1
19	VAISHNAVI SUDHAKAR SAKINALA		14	14	16	16	14	74	70	14	16	1	14	16	1	16	16	1	16	16	1	14	16	1
20	YASH SANJAY DHADEKAR		12	12	12	12	12	60	60	12	16	1	12	16	1	12	16	1	12	16	1	12	16	1
No. of students more than 60% marks										16				16				16			12			18
Number of students attending CO related questions										20				20				20			20			20
% of students scoring more than 60% marks										80				80.00				80.00			60.00			90.00

CO	% of students successfully attaining the CO	LEVEL
CO-1	80	3
CO-2	80	3
CO-3	80	3
CO-4	60	3
CO-5	90	3

If 80 percent Students scoring more 60 percent write-3 (High)
If 70 percent Students scoring more 60 percent write-2 (Medium)
If 60 percent Students scoring more 60 percent write-1 (LOW)
If less 60 percent Students scoring more 60 percent write-0 (NOT ATTAINED)



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Swaminarayan Siddhanta Institute of Technology, Nagpur	Attainment of COs In Practical
Electronics & Telecommunication Engineering	Session:-2021-22
	Sem:-III

Subject Code:- BEETC-302P/BEEN-302P/BEEC-302P

Subject:- Component for Electronic Circuit Design

ROLL NO.	Name of Students	Experiment No	CO1										CO2			CO3			CO4			CO5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
			1	2	3	4	5	6	7	8	9	10	Total Marks (100)	Final Marks (25)	Total of Marks Obtained	CO Attained	Total of Marks Obtained	CO Attained	Total of Marks Obtained	CO Attained	Total of Marks Obtained	CO Attained	Total of Marks Obtained																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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CO	% of students successfully attaining	the CO	LEVEL
CO-1	85		3
CO-2	100		3
CO-3	75		2
CO-4			
CO-5			

If 80 percent Students scoring more than 80 percent write -3 (High)
If 75 percent Students scoring more than 75 percent write -2 (Medium)
If 70 percent Students scoring more than 70 percent write -1 (Low)
If less 65 percent Students scoring more than 65 percent write 0 (NOT ATTAINED)

Principal

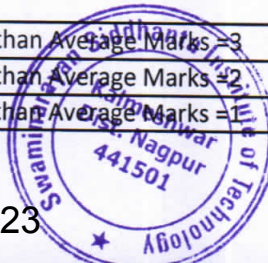


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University Result Analysis 2021-22
Sub: Component for Electronic Circuit Design
Class: 3rd Sem

S. No.	Student Name	RTMNU Marks (out of 70)
1	ACHAL NILKANTHA HAJARE	40
2	ANKIT SADANAND KUSHWAHA	53
3	APEKSHA SANJAY NANDURKAR	54
4	ASHWAJIT DADARAO NARANJE	56
5	CHANCHAL KOMAL NAVGHARE	42
6	DEEPAK CHAITRAM BAWANKULE	56
7	HARSHAL GAJENDRA KHADASE	53
8	MANGESH PRABHAKAR SHRIRAO	42
9	MAYURI KAWDUJI MARASKOLHE	46
10	MOHD MOIN IMRAN AHMAD	35
11	K NANDINI RAO	44
12	NITESH DEWAJI KAMBALE	54
13	PAYAL NAROTTAM MESHRAM	39
14	SAI SHRIDHAR BACHHAV	39
15	SHANTANU HARIBHAU TALMALE	42
16	SHASHANK JAWAHAR GAJBHIYE	54
17	SURAJ RAJESH TAYADE	49
18	TARAFDAR KUNDAN KINGKAR	23
19	VAISHNAVI SUDHAKAR SAKINALA	56
20	YASH SANJAY DHABEKAR	22
Average		44.95
No. students scoring more than Average marks		10
Percentage of students scoring more than Average marks		50.00

Above 50% student scoring more than Average Marks = 3
Above 40% student scoring more than Average Marks = 2
Above 30% student scoring more than Average Marks = 1

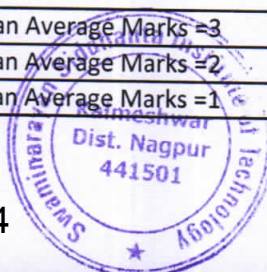


University Result Analysis 2021-22
Sub: Component for Electronic Circuit Design
Class: 3rd Sem

S. No.	Student Name	RTMNU Marks (out of 25)
1	ACHAL NILKANTHA HAJARE	22
2	ANKIT SADANAND KUSHWAHA	21
3	APEKSHA SANJAY NANDURKAR	21
4	ASHWAJIT DADARAO NARANJE	22
5	CHANCHAL KOMAL NAVGHARE	22
6	DEEPAK CHAITRAM BAWANKULE	21
7	HARSHAL GAJENDRA KHADASE	22
8	MANGESH PRABHAKAR SHRIRAO	23
9	MAYURI KAWDUJI MARASKOLHE	22
10	MOHD MOIN IMRAN AHMAD	22
11	K NANDINI RAO	23
12	NITESH DEWAJI KAMBALE	21
13	PAYAL NAROTTAM MESHRAM	22
14	SAI SHRIDHAR BACHHAV	21
15	SHANTANU HARIBHAU TALMALE	22
16	SHASHANK JAWAHAR GAJBHIYE	22
17	SURAJ RAJESH TAYADE	21
18	TARAFDAR KUNDAN KINGKAR	23
19	VAISHNAVI SUDHAKAR SAKINALA	23
20	YASH SANJAY DHABEKAR	22
Average		21.90
No. students scoring more than Average marks		14
Percentage of students scoring more than Average marks		70.00

Above 50% student scoring more than Average Marks =3
Above 40% student scoring more than Average Marks =2
Above 30% student scoring more than Average Marks =1

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Electronics & Telecommunication Engineering

CO ATTAINMENT

Subject : Component for Electronic Circuit Design										Subject Code: BEETC-302T/BEEN-302T/BEEC-302T										Class: 3rd sem									
Sem	Course Name	CO	INTERNAL TOOLS										EXTERNAL TOOLS										Overall CO Attainment						
			Sessional-1		Sessional-2		Assignment		PUT		Practical		RTMNU_Th		RTMNU_Pr														
			Percentage of students scoring more than 60% marks	Attainment Level	Percentage of students scoring more than 60% marks	Attainment Level	Percentage of students scoring more than 80% marks	Attainment Level	Percentage of students scoring more than 60% marks	Attainment Level	Percentage of students scoring more than 80% marks	Attainment Level	Percentage of students scoring more than 80% marks	Attainment Level	Percentage of students scoring more than 80% marks	Attainment Level													
III	Component for Electronic Circuit Design	CO1	75	2			96	3	80	3	85	3	50	3	70	3	2.95												
		CO2	95	3			96	3	80	3	100	3	50	3	70	3		3.00											
		CO3			80	3	96	3	80	3	75	2	50	3	70	3			2.95										
		CO4			75	2	96	3	60	1			50	3						2.80									
		CO5					98	3	90	3			50	3							3.00								
Average CO Attainment																	2.94												



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PO Attainment

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Average CO Correlation	3.00	2.80	2.50	2.00						1.00		3.00	3.00	3.00	3.00
Direct Attainment with relevance	2.94	2.74	2.45	1.96	0.00	0.00	0.00	0.00	0.00	0.98		2.94	2.94	2.94	2.94

Note : Direct attainment is obtained from formula- (Average Correlation * Average CO Attainment)/3. in this case average CO attainment is 2.94 obtained from previous sheet.

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COURSE END FEEDBACK

Subject: Component for Electronic Circuit Design

Dear Student,

The purpose of this survey is to obtain input from the students, for assessment the Course Outcomes (COs). As a student of 3rd Sem Electronics and Telecommunication Engineering program at Swaminarayan Siddhanta Institute of Technology, Nagpur. We seek your help in completing this survey. Your response is a key part of our continuous improvement process. Your participation is greatly appreciated.

Please insert ✓ in the appropriate box to indicate the degree of your satisfaction level.

1: Poor, 2: Good, 3: Excellent

S.N.	Course Outcomes (COs)	1	2	3
1	Understand the principles of semiconductor physics.		✓	
2	Understand the principles of semiconductor diode.			✓
3	Understand and analyze the mathematical model of transistors.			✓
4	Understand and analyze the mathematical model of unipolar transistors.			✓
5	Understand the process of Integrated Circuit Fabrication.		✓	

Any other suggestions: How to improve? / Any other comments.

.....
.....

Signature: Apeksha


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COURSE END FEEDBACK

Subject: Component for Electronic Circuit Design

Dear Student,

The purpose of this survey is to obtain input from the students, for assessment the Course Outcomes (COs). As a student of 3rd Sem Electronics and Telecommunication Engineering program at Swaminarayan Siddhanta Institute of Technology, Nagpur. We seek your help in completing this survey. Your response is a key part of our continuous improvement process. Your participation is greatly appreciated.

Please insert ✓ in the appropriate box to indicate the degree of your satisfaction level.

1: Poor, 2: Good, 3: Excellent

S.N.	Course Outcomes (COs)	1	2	3
1	Understand the principles of semiconductor physics.		✓	
2	Understand the principles of semiconductor diode.		✓	
3	Understand and analyze the mathematical model of transistors.		✓	
4	Understand and analyze the mathematical model of unipolar transistors.			✓
5	Understand the process of Integrated Circuit Fabrication.			✓

Any other suggestions: How to improve? / Any other comments.

.....

.....

Signature:


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Session: 2021-22

Course Outcomes Attainment

(Sem: 3rd)

Name of Program/ Dept.: Electronics & Telecommunication

Course Code: BEETC 802 T Course Name: CECD

Name of Faculty: Reshma Pawar

Assessment Tool	Course Outcomes (COs) Attainment in %					
	CO1	CO2	CO3	CO4	CO5	CO6
Progressive Test-1	66.66	100				
Progressive Test-2			100	66.66		
Assignment	100	100	100	33.33	100	
Continuous Assessment Practical	100	100	100	100	100	
Theory University Score	100	100	66.66			
Practical University Score	100	100	100			
Direct CO attainment (Average of Above)	94.44	100	94.44	75	100	
Indirect CO attainment from feedback	80	81.66	65	78.33	86.66	
CO attainment (80% of Direct+20% of Indirect)	75.55+ 16= 91.55	80+ 16.33= 96.33	75.55+ 13= 88.55	60+ 12.53= 72.53	80+ 12.97= 92.97	


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Reshma Pawar

Name & Sign of Course Faculty



Session: 2021-22

Course Outcomes Attainment

(Sem: 4th)

Name of Program/ Dept.: Electronics & Telecommunication

Course Code: BETEC-3025


Course Name: ECED

Name of Faculty: Reshma Pawar

Assessment Tool		Course Outcomes (COs) Attainment in %					
		CO1	CO2	CO3	CO4	CO5	CO6
Internal Tool	Sessional-1	66.66	100				
	Sessional-2			100	66.66		
	Pre University Test	100	100	100	33.33	100	
	Assignment	100	100	100	100	100	
	Continuous Assessment Practical	100	100	66.66			
External Tool	Theory University Score	100	100	100	100	100	
	Practical University Score	100	100	100			
Direct CO attainment (20% of Internal Tool+ 80% of External Tool)		18.33+ 80= 98.33	20+ 80= 100	18.33 +80 =98.33	13.33+ 80= 93.33	20+ 80= 100	
Indirect CO attainment from feedback		86	81.66	65	78.33	86.66	
CO attainment (80% of Direct+20% of Indirect)		78.66+ 16= 94.66	80+ 16.33= 96.33	78.66+ 13= 91.66	74.66+ 12.53= 87.19	80+ 12.97= 92.97	


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Reshma Pawar
Name & Sign of Course Faculty



Session: 2021-22

Course Outcomes Attainment Gap Analysis

(Sem: 3rd)

Name of Program/ Dept.: Electronics and Telecommunication

Course Code: BEETC-302T Course Name: CED

Name of Faculty: Reshma Pawar

Course Outcomes (COs)	COs Target in %	COs Attainment in %	COs Attainment Gap in %	Action Proposed to bridge the Gap	Modification
CO1	85%	94.66	+ 9.66		
CO2		96.33	+ 11.33		
CO3		91.66	+ 6.66		
CO4		87.19	+ 2.19		
CO5		92.97	+ 7.97		
CO6					

Reshma Pawar
Name & Sign of Course Faculty

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