2.6.2 Attainment of Program Outcomes and Course Outcomes are evaluated

Attainment of Course Outcomes (COs): Course Outcomes can be attained from the assessment of Internal Examinations, Assignments and University Examinations. Each question in mid, assignment and semester end examination are tagged to the corresponding course outcome.

CO attainment through Internal Assessment: CO Attainment of all theory courses is carried out using the students' performance in Mid Semester Examinations and Assignments. CO Attainment of all laboratory courses is carried out using the assessment of students' performance in Experiment Execution, Viva-Voce (Day-to-Day performance) and Record evaluation, Internal Laboratory Examinations.

CO attainment through University Examinations: This assessment is based on the students' performance in University Examinations or End Semester Examination.

Students scored above 60% of the Maximum Marks is treated as Attained. The percentage of students scored above 60% of the Marks shall be evaluated.

Attainment Level 1: Less than 69% of students scored **set attainment level** in the examination or more than average percentage marks.

Attainment Level 2: 70% to 79% of students scored **set attainment level** in the examination or more than average percentage marks.

Attainment Level 3: 80% of students scored **set attainment level** in the examination or more than average percentage marks.

For the theory courses, Internal examinations constitute 20% Weightage, Assignment constitute 10% Weightage and University examination constitute 70% weightage. For the laboratory courses, Internal examinations constitute 10% Weightage, Day-to-Day evaluation and Record evaluation constitute 20% Weightage and University examination constitute 70% weightage. For the Major Project work course, Internal Reviews constitute 50% Weightage and University examination constitute 50% weightage.

Attainment of Program Outcomes:

In order to obtain the PO attainment, both the Direct attainment and Indirect attainments are considered. The weightage for Direct attainment is 80%. The weightage for Indirect attainment is 20%.

Direct attainment is based on the performance of the students in the Internal Examinations, Assignment and end semester examinations of all the courses of the Program, from First year to Fourth Year of the UG Program. Direct attainment is obtained with the help of the CO attainment of all the courses of the Program, by considering the CP-PO articulation matrix and CO-PSO articulation matrix of each course.

Indirect attainment is based on the Feed backs given by the students on the Course outcomes and Program outcomes, known as Course Exit Survey, Program Exit Survey. Indirect attainment is also based on the Portfolio components. Co-Curricular Activities, Extra Curricular Activities, Placement and Higher Studies are collectively called as Portfolio components.

Course Exit Survey is taken for each course at the end of all semesters. Program Exit Survey shall be taken at the end of the Program.

Co-Curricular Activities include participation of students in Industrial Visits, Internships, Field Trips, Workshops, Seminars, Conferences, Certification Programs, Online Certification Courses, Journal Publications, participation in Paper Presentation, Poster Presentation, Quiz, Project Expo, etc. Extra Curricular Activities include Sports, Games, NSS, NCC, Cultural Activities.

The Course Exit Survey and Program Exit Survey shall be given 10% Weightage. The Portfolio components shall be given 10% Weightage.

Attainment of Course Outcomes and Program Outcomes

Dr. Lankapalli Bullayya College of Engineering

(Approved by AICTE, New Delhi, Affiliated to Andhra University, Visakhapatnam)

Resapuvanipalem, Visakhapatnam,

Andhra Pradesh 530013.

Website: https://lbce.edu.in/

1. Institute Vision and Mission

Dr.Lankapalli Bullayya College of Engineering, Visakhapatnam was established in the year 2010. It is a reputed self-financed Educational Institution offering B.Tech Programmes in Four Branches of Engineering. The college is approved by AICTE, New Delhi and Permanently affiliated to Andhra University, Visakhapatnam.

Currently the college is offering the following B.Tech Programmes.

S. No.	Programme	Approved Intake
1	B.Tech Civil Engineering	60
2	B.Tech Computer Science and Engineering	120
3	B.Tech Electrical and Electronics Engineering	60
4	B.Tech Electronics and Communication Engineering	120

Vision of the Institution:

To provide Value-based Engineering Education to the Students for transforming them as proficient Technocrats and motivating them to explore new knowledge through Research and Development for fulfilling the global needs of humanity and for empowering the community.

Mission of the Institution:

1. To develop into a high quality Technical Education Institution with emphasis on Technical Academic Excellence, Innovative Research and Development Programmes with core human values.
2. To enhance Employability opportunities and entrepreneurship.
3. To consolidate the state-of-the-art Infrastructure and equipment for Teaching and Research activities.
4. To design and deliver Curricula to meet the National and Global changing requirements through Student-Centric Learning Methodologies.

2. Program Outcomes (POs)

Program outcomes describe what students are expected to know and would be able to do by the time of graduation. These relate to the skills, knowledge, and behaviours that students acquire as they progress through the program.

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.

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.

Publication and dissemination of Program Outcomes

The Program Outcomes are published and disseminated as follows

Table 2.1: PO publishing and dissemination

How Published	Where Published	How Disseminated
Incorporating in Course files and Lab manuals	Course files, Lab manuals	Discussed in the classes, laboratories by faculty members Discussed during student counselling Distributed along with course files and lab manuals
Flexi/ Banner	Classrooms, Laboratories, HOD chamber, Department Notice boards, Staff Rooms, Library, Training and Placement Cell Skill Development Cell Internal Quality Assurance Cell Examination Cell Research and Development Cell	Self-reading by students, parents and alumni, employer during their visit to college
Digital Media	College Website: https://lbce.edu.in	Available for Self- reading in college website

3. Program Educational Objectives and Program Specific Outcomes

Program Educational Objectives (PEOs):

Program Educational Objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

Program Specific Outcomes (PSOs):

Program Specific Outcomes are statements that describe what the graduates of a specific engineering program should be able to do.

The Process for Establishing the PEOs of the Departments:

The PEOs are established through the following process:

Step- 1: Vision and Mission of the College & Department are taken into consideration to interact with various stake holders, and establish the PEOs.

Step- 2: The Head of the Department, Department Academic Committee consisting of Senior Faculty members prepares the draft version of PEOs and PSOs.

Step- 3: The draft version is shared with the stakeholders like faculty members, students, alumni, employer and their views are collected by the Program Co-ordinator.

Step- 4: The Department Academic Committee reviews and analyzes the views on PEOs and PSOs and submits its recommendations to the Department Advisory Board.

Step-5: The Department Advisory Board discusses on the recommendations and finalizes the PEOs and POs and submits them to the BOG for final approval.

Thus, the PEOs are established, checked for consistency with the vision and mission of the department.

The Process for Establishing the PSOs of the Departments:

The POs are established through the following process:

The Vision, Mission, PEOs of the Department along with the 12 Graduate Attributes are used in defining the PSOs.

Step 1: Department Academic Committee consults the key constituents: faculty and collects their views and prepares the draft version of the PEOs and PSOs.

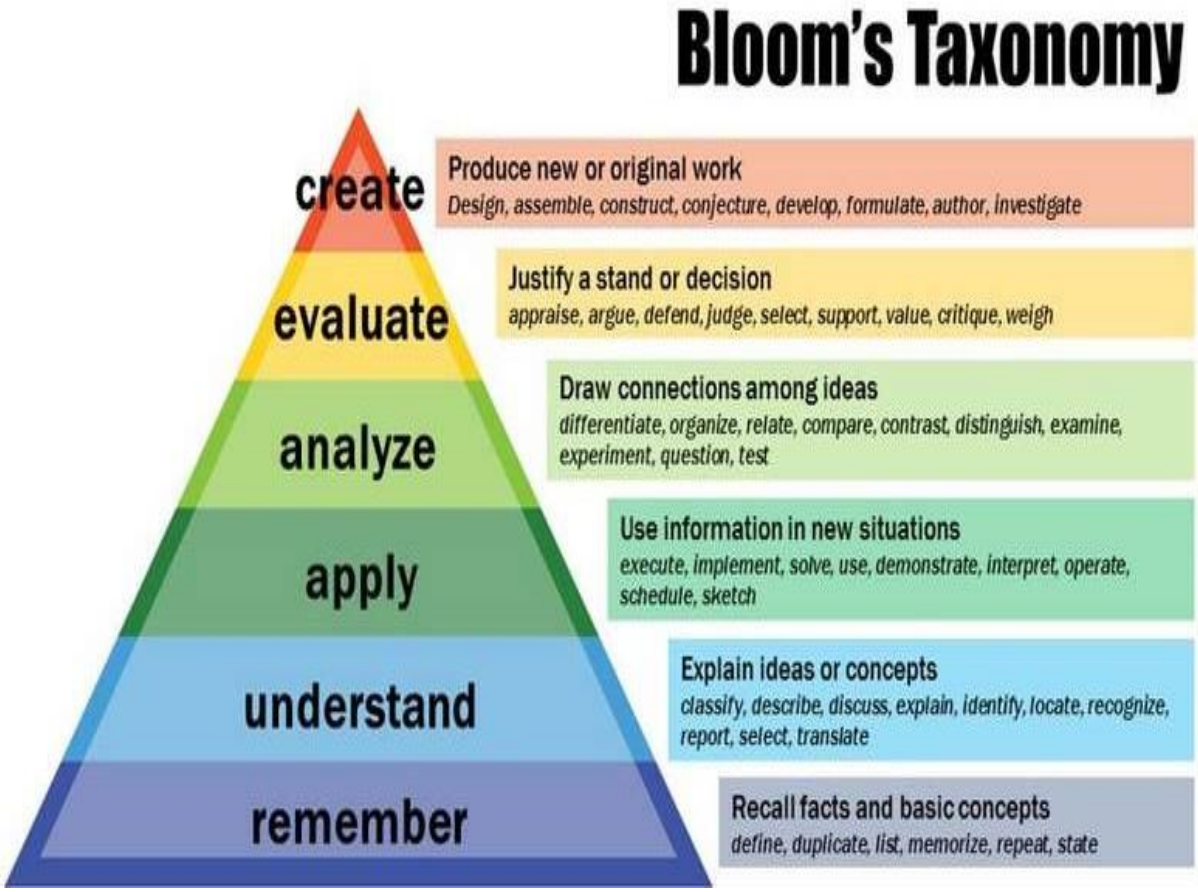
Step 2: The Department Academic Committee then gather views from the Alumni, Professional Body representatives, Industry representatives / Employer along with the faculty and revise the draft.

Step 3: The Department Assessment Audit Committee analyze and express its opinion on the revised PEOs and PSOs and forwards the same for final approval to Department Advisory Committee.

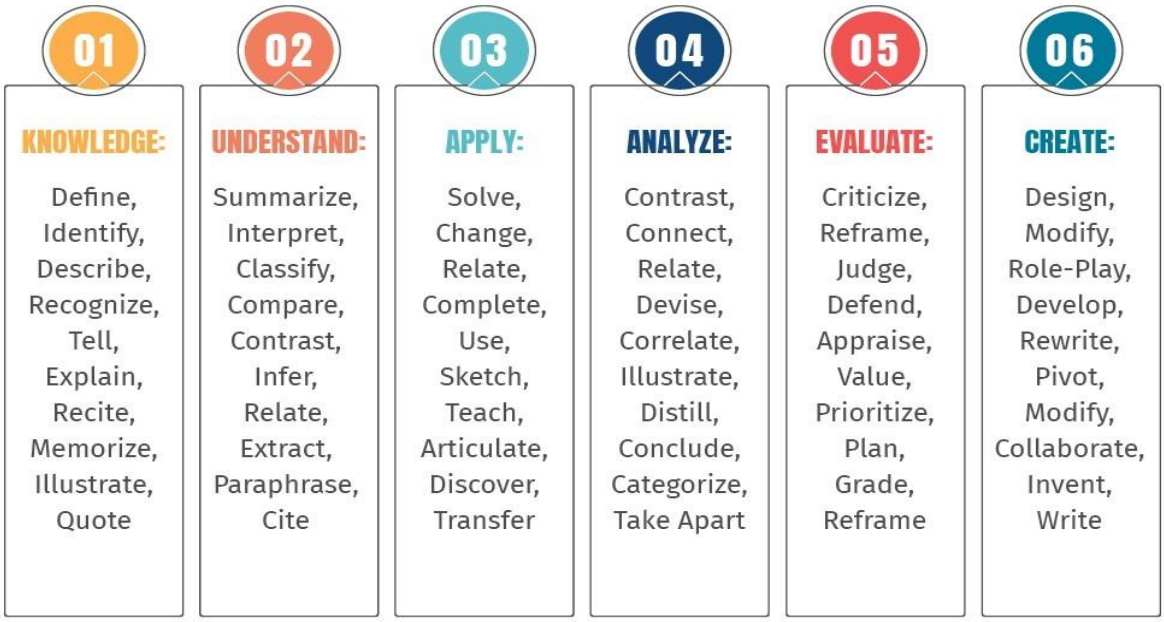
Step 4: Department Advisory Committee deliberate on the views expressed by the Department Assessment Audit Committee and formulate the accepted views based on which PSOs are to be established.

4. BLOOM'S TAXONOMY

Bloom's Taxonomy was created in 1956 under the leadership of educational psychologist Dr Benjamin Bloom in order to promote higher forms of thinking in education, such as analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts. It is most often used when designing educational, training, and learning processes.



Blooms Taxonomy Levels



Examples Of Bloom's Taxonomy Active Verbs

Level 1 Knowledge: Define, Identify, Describe, Recognize, Tell, Explain, Recite, Memorize, Illustrate, Quote, State, Match, Recognize, Select, Examine, Locate, Recite, Enumerate, Record, List, Quote, Label

Level 2 Understand: Summarize, Interpret, Classify, Compare, Contrast, Infer, Relate, Extract, Paraphrase, Cite, Discuss, Distinguish, Delineate, Extend, Predict, Indicate, Translate, Inquire, Associate, Explore Convert

Level 3 Apply: Solve, Change, Relate, Complete, Use, Sketch, Teach, Articulate, Discover, Transfer, Show, Demonstrate, Involve, Dramatize, Produce, Report, Act, Respond, Administer, Actuate, Prepare, Manipulate

Level 4 Analyze: Contrast, Connect, Relate, Devise, Correlate, Illustrate, Distill, Conclude, Categorize, Take Apart, Problem-Solve, Differentiate, Deduce, Conclude, Devise, Subdivide, Calculate, Order, Adapt

Level 5 Evaluate: Criticize, Reframe, Judge, Defend, Appraise, Value, Prioritize Plan, Grade, Reframe, Revise, Refine, Grade, Argue, Support, Evolve, Decide, Re-design, Pivot

Level 6 Create: Design, Modify, Role-Play, Develop, Rewrite, Pivot, Modify, Collaborate, Invent, Write, Formulate, Invent, Imagine

5. Course Outcomes (COs)

Statements indicating what a student can do after the successful completion of a course. Every Course leads to some Course Outcomes. The CO statements are defined as per the syllabus and content of the course. The number of Course outcomes for a theory course varies from four to six. The number of Course outcomes for a laboratory course varies from three to six. The keywords used to define COs are based on the Bloom's Taxonomy.

Sample CO Statements:

Course: Electromagnetic Field Theory and Transmission Lines

At the end of the course the student will be able to

CO1 Understand the electrostatic laws and apply these laws to solve the problems related to electric field.

CO2 Understand the magnetostatic laws and apply these laws to solve the problems related to magnetic field.

CO3 Derive the Maxwell's equations in static and dynamic fields.

CO4 Analyze the Electromagnetic wave propagation in different mediums and determine the Power using Poynting Theorem.

CO5 Relate the wave propagation through transmission lines and compute the impedance using smith chart for matching the load impedance.

Course Outcomes are the statements that declare what students should be able to do at the end of a course. POs are defined by Accreditation Agencies of the country (NBA in India), which are the statements about the knowledge, skills and attitudes, graduate attributes of a formal engineering program should have. Graduates Attributes (GAs) are the components indicative of the graduate's potential to acquire competence to practice at the appropriate level. GAs form a set of individually assessable outcomes of the program. The NBA laid down the graduate attributes relating to program outcomes and is to be derived by program.

The Program outcomes reflect the ability of graduates to demonstrate knowledge in fundamentals of Basic Sciences, Humanities and Social Sciences, Engineering Sciences and apply these principles in understanding and practically apply the knowledge in professional core subjects, electives and projects which enables the graduates to be competent at the time of graduation. The graduates must adhere to professional and ethical responsibilities in the pursuit of their careers and also for the benefit of the society. These outcomes also enable the graduate to pursue higher studies and engage in R&D for a successful professional career.

The proper definition and the attainment of POs contribute to the attainment of Program Educational Objectives which will help the graduate to perform his/ her duties, professional responsibilities, design, development, production and testing of novel products, ability to deal with finances and project management during his/her early professional career of 3 to 4 years.

Program Specific Outcomes are the statements that assert what the grandaunts of a specific engineering program should do what they can able to do. Program Educational Objectives are the broad statements which describe in detail about the career and professional accomplishments after significant years of graduation that the program prepares the grandaunts to achieve.

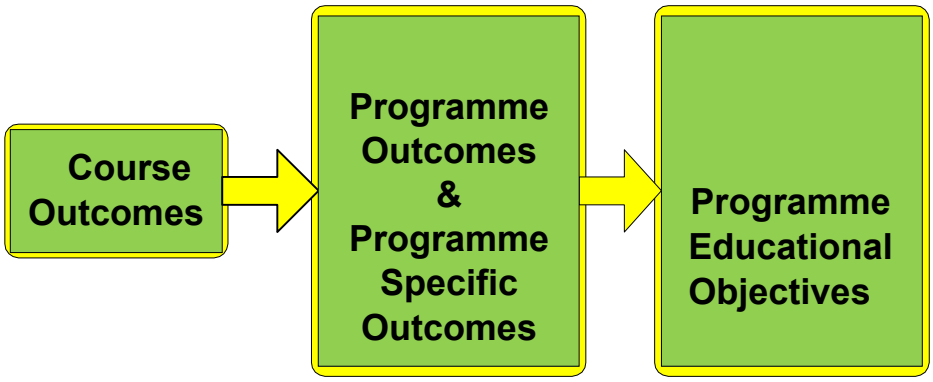


Figure : Relation between the outcomes (CO-PO&PSO-PEO)

After the course (subject) allotment from the department, the course co-ordinator and course instructors of the course has to write appropriate COs for their corresponding course. It should be narrower and measurable statements. By using the action verbs of learning levels, CO's shall be designed. CO statements should describe what the students are expected to know and able to do at the end of each course, which are related to the skills, knowledge and behavior that students will acquire through the course.

After CO statements are developed by the course co-ordinator and course instructors, CO will map with any possible PO's based on the relationship exist between them. But the PO's are not necessarily mapped with any one CO and it may be left blank. It is mandatory that all POs should be mapped with any one of PSO and PEO which are specified in the program. This is shown in the below figure.

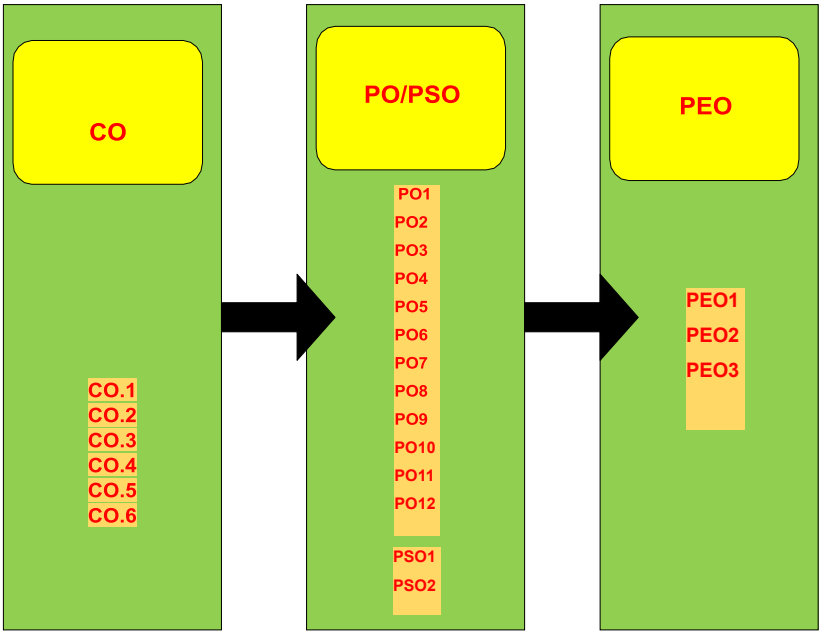


Figure: Relationship between CO, PO &PSO and PEO

CO - PO Mapping and CO - PSO Mapping

Each Course Outcome is mapped to a certain Program Outcome and a Program Specific Outcome with a different Correlation level. All the courses of the Program must cover all the POs (and PSOs). For each course we map the COs to POs through the CO-PO articulation matrix and to PSOs through the CO-PSO articulation matrix.

The different correlation levels are:

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

The CO-PO mapping shall be performed by course instructors.

6. Attainment of Course Outcomes

Course Outcomes can be attained from the assessment of Internal Examinations, Assignments and University Examinations.

Direct Attainment 1: Measuring CO attainment through Internal Assessment
CO Attainment of all theory courses is carried out using the students' performance in Mid Semester Examinations (Internal Theory Examinations) and Assignments. This is called as Continuous Internal Evaluation of theory courses.

CO Attainment of all laboratory courses is carried out using the students' performance in Experiment Execution, Viva-Voce (which is called as Day-to-Day performance) and Record evaluation, performance in Internal Laboratory Examinations. This is called as Continuous Internal Evaluation of laboratory courses.

Direct Attainment 2: Measuring CO attainment through University Examinations
This assessment is based on the students' performance in University Examinations or End Semester Examination (ESE).

Students scored above 60% of the Marks is treated as Attained.

i.e., The set attainment level in the examination is "score above 60% of the Marks".

The percentage of students scored above 60% of the Marks shall be evaluated.

Attainment Level 1: Lessthan 69% of students scored **set attainment level** in the examination or more than average percentage marks.

Attainment Level 2: 70% to 79% of students scored **set attainment level** in the examination or more than average percentage marks.

Attainment Level 3: 80% of students scored **set attainment level** in the examination or more than average percentage marks.

Students scoring more than average percentage marks can also be treated as Attained. But it has not considered here.

For the theory courses, Internal examinations constitute 20% Weightage, Assignment constitute 10% Weightage and University examination constitute 70% weightage.

For the laboratory courses, Internal examinations constitute 10% Weightage, Day-to-Day evaluation and Record evaluation constitute 20% Weightage and University examination constitute 70% weightage. For the Major Project work course, Internal Reviews constitute 50% Weightage and University examination constitute 50% weightage.

CO Attainment Calculation of a Course:

Sample calculation of theory course: Course Outcomes Attainment using Mid Examinations

First MID Examination												
		1a	1b	1c	1d	1e	2a	2b	3a	3b	4a	4b
	Maximum Marks	2	2	2	2	2	5	5	5	5	5	5
S.No	Regd. No	CO1	CO1	CO1	CO2	CO2	CO1	CO1	CO2	CO2	CO1	CO2
1	321136410001	2	2	2	2	2	3	4	4			
2	321136410001	2	2				2	3			5	
3	321136410003	2	2				5	5	5	5		
4	321136410004	1	2				4	3			4	
5	321136410005		2				5	4	4			
6	321136410006	2	2				5	4	4			
7	321136410007						5	2				
8	321136410008								4	3	2	3
9	321136410009	1	2	2	2	1	4	5			5	4
10	321136410010		2		2	2			5		5	5
11	321136410011		2			2	5		5			3
12	321136410012			1			5					
13	321136410013						2				3	
14	321136410014	2	2	2	2	2	5	2		1		
15	321136410015	2	2	2			5	4				
16	321136410016	2	2	2	2		5	4			3	5
17	321136410017	2	2	2			5	5			5	3
18	321136410018	2	2	2			5	4	5	4		
19	321136410019	2	2	2	2	2	5	5	5	4		
20	321136410020	2	2	2	2	2					2	
21	321136410021	2	1				5	4	5	5		
22	321136410022	2	2	2	2	2			5	4	5	5
23	321136410023	2	2	2	2		5	5			5	5
24	321136410024	2	2	1	1		4	3	4	4		
25	321136410025	2	2			2			5	2		
26	321136410026	2	2	2	2	2			5	5	5	3
27	321136410027	1					5		5			
28	321136410028	2	2	2	2	2	5	5			5	4
29	321136410029	2	2	2	2	2	5	5			5	4
30	321136410030	2	1						3	2	3	3
31	321136410031		1		2	2				2	5	
32	321136410032	2	2	2	2	2	5	5	5	5		
33	321136410033	2	2	2	2	2	5	5	5	5		
34	321136410034	2	2	1				4	5	5		
35	321136410035	1	2		2	2	5	4		4		
36	321136410036	2	2	2	2	2	3	2		5	5	
37	321136410037	2	2		2				2			1
38	321136410038	2	2		2	2			5	5	4	5
39	321136410039	2	2				5	5	5	1		
40	321136410040	2	2	2	2	2	4	5	5	5		
		1a	1b	1c	1d	1e	2a	2b	3a	3b	4a	4b
		CO1	CO1	CO1	CO2	CO2	CO1	CO1	CO2	CO2	CO1	CO2
	No of students (Attempted)	32	35	21	21	19	29	26	23	20	18	14
	No of students scored above 60% (Attained)	28	32	18	20	18	27	23	22	15	16	13
	Attainments%	87.5	91.429	85.714	95.238	94.74	93.1	88.462	95.65217	75	88.89	92.9
	Attainment Level	3	3	2	2	2	3	3	3	3	3	3

Second MID Examination												
		1a	1b	1c	1d	1e	2a	2b	3a	3b	4a	4b
	Maximum Marks	2	2	2	2	2	5	5	5	5	5	5
S.No	Regd. No	CO3	CO3	CO4	CO4	CO5	CO3	CO3	CO4	CO4	CO5	CO5
1	321136410001	2	2	2	2	2	5	5	5	5	5	5
2	321136410001	2	2	2	1	2	3	2			5	5
3	321136410003	2	2	2		2	5	4			5	4
4	321136410004	2	2	2		2		2	5	5	5	
5	321136410005	2		2	2				2	4		
6	321136410006	2	2	2	2	2	5		5	4		
7	321136410007	2	2	2	2	2			5	5	5	
8	321136410008	2	2	2	2				5	5	5	5
9	321136410009	2	2	2						3		3
10	321136410010	2	2	2	2	2			5	4	4	5
11	321136410011	2	2	2	2	2		4			5	5
12	321136410012	2	2		2	2	5	2			5	5
13	321136410013	2							5	3	5	5
14	321136410014	1	2					4			5	5
15	321136410015	2	2	2	2	2			5	4	5	5
16	321136410016	2	2	2	2	2			5	4	4	5
17	321136410017	2	2	2	2	2			5	5	5	5
18	321136410018	2	2	2	2	2			5	5	3	5
19	321136410019	2	2	2	1	2	5	5	5	4		
20	321136410020	2	2	2	2	2	5	5	5	4		
21	321136410021			2	2			5	5	5		
22	321136410022	2	2	2	2	2	5	5	5	5		
23	321136410023	2	2	2		2	5		5	4		4
24	321136410024	2	2	2	2	2	5	5	5	5		
25	321136410025	2	2	2	2	2	5	2			4	2
26	321136410026	2	2	1				2			5	
27	321136410027	2	2	2	2	2	5	4	5	5		
28	321136410028			2	2	2						
29	321136410029	2	2	2	2	2			5	5	4	2
30	321136410030	2	2	2	2	2	5	5	5	5		
31	321136410031		2	2						3		3
32	321136410032	2	2	2					5	5		
33	321136410033	2	2	2	2	2			5	5	5	5
34	321136410034	2	2	2	2	2			5	5	5	5
35	321136410035		2	2	2	2			1	2	3	
36	321136410036		2	2	2		2	2	5	3		
37	321136410037	2	2	2	2	2	5	2			5	5
38	321136410038	1	2	2	2	2	2	5			3	
39	321136410039	2	2	2	2	2	5	5	5	5		
40	321136410040	2	2	2	2	2	5	5	5	5		
		2	2	2	2		5	5		5		
		1a	1b	1c	1d	1e	2a	2b	3a	3b	4a	4b
	No of students (Attempted)	CO3	CO3	CO4	CO4	CO5	CO3	CO3	CO4	CO4	CO4	CO5
	No of students scored above 60% (Attained)	35	36	37	31	29	18	21	27	30	22	20
	Attainments%	33	36	36	29	29	16	14	25	29	22	18
	Attainment Level	94.29	100	97.3	93.5484	100	88.889	66.667	92.593	96.667	100	90

Course Outcomes Attainment using Mid Examinations

	Mid Questions		Internal Examinations Attainment				
			CO1	CO2	CO3	CO4	CO5
Part-1A	Q1	1a	3				
		1b	3				
		1c	2				
		1d		2			
		1e		2			
Part-1B	Q2	2a	3				
		2b	3				
	Q3	3a		3			
		3b		3			
	Q4	4a	3				
		4b		3			
Part-2A	Q1	1a			3		
		1b			3		
		1c				3	
		1d				2	
		1e					3
Part-2B	Q2	2a			3		
		2b			2		
	Q3	3a				3	
		3b				3	
	Q4	4a				3	
		4b					3
		Average	2.83	2.6	2.75	2.8	3

Course Outcomes Attainment using Assignments

S.No	Regd. No	Assignment Marks	
		A1	A2
		5 Marks	5 Marks
		CO1-CO2	CO3-CO5
		5	5
1	321136410001	5	5
2	321136410001	5	5
3	321136410003	5	5
4	321136410004	5	5
5	321136410005	5	5
6	321136410006	5	5
7	321136410007	5	5
8	321136410008	5	5
9	321136410009	5	5
10	321136410010	5	5
11	321136410011	5	5
12	321136410012	5	5
13	321136410013	5	5
14	321136410014	5	5
15	321136410015	5	5
16	321136410016	5	5
17	321136410017	5	5
18	321136410018	5	5
19	321136410019	5	5
20	321136410020	5	5
21	321136410021	5	5
22	321136410022	5	5
23	321136410023	5	5
24	321136410024	5	5
25	321136410025	5	5
26	321136410026	5	5
27	321136410027	5	5
28	321136410028	5	5
29	321136410029	5	5
30	321136410030	5	5
31	321136410031	5	5
32	321136410032	5	5
33	321136410033	5	5
34	321136410034	5	5
35	321136410035	5	5
36	321136410036	5	5
37	321136410037	5	5
38	321136410038	5	5
39	321136410039	5	5
40	321136410040	5	5
	No of students Attempted	40	40
	No of students Scored above 60%	40	40
	Attainments%	100	100
	Attainment Level	3	3

Course Outcomes Attainment using Semester END Examination Results

Semester END Examination Results			
S.No	Roll Number	Grade Points	Grades
		10	
1	321136410001	7	B+
2	321136410002	5	C
3	321136410003	7	B+
4	321136410004	4	P
5	321136410005	4	P
6	321136410006	6	B
7	321136410007	0	F
8	321136410008	4	P
9	321136410009	7	B+
10	321136410010	7	B+
11	321136410011	5	C
12	321136410012	0	F
13	321136410013	4	P
14	321136410014	6	B
15	321136410015	6	B
16	321136410016	7	B+
17	321136410017	8	A
18	321136410018	6	B
19	321136410019	7	B+
20	321136410020	5	C
21	321136410021	8	A
22	321136410022	7	B+
23	321136410023	8	A
24	321136410024	5	C
25	321136410025	0	F
26	321136410026	5	C
27	321136410027	0	F
28	321136410028	7	B+
29	321136410029	8	A
30	321136410030	4	P
31	321136410031	5	C
32	321136410032	9	A+
33	321136410033	8	A
34	321136410034	5	C
35	321136410035	5	C
36	321136410036	7	B+
37	321136410037	4	P
38	321136410038	6	B
39	321136410039	8	A
40	321136410040	10	O
	No of students Attempted	40	
	No of students Attained (Grade Points>=6)	22	
	Attainment %	55.00	
	Attainment Level	1	

Examination Grades of Andhra University, Visakhapatnam			
Grade	Grade Points	Grade description	Required Percentage of Marks
O	10	Out Standing	90% to 100%
A+	9	Excellent	80% to 90%
A	8	Very Good	70% to 80%
B+	7	Good	60% to 70%
B	6	Above Average	55% to 60%
C	5	Average	50% to 55%
P	4	Pass	40% to 50%
F	0	Fail	Less than 40%

Overall Course Outcomes Attainment

Overall Course Outcomes Attainment				
COs	Mid Exams	Assignments	Semester End Exam	Final CO Attainment
CO1	2.833333333	3.00	1.0	1.57
CO2	2.6	3.00	1.0	1.52
CO3	2.75	3.00	1.0	1.55
CO4	2.8	3.00	1.0	1.56
CO5	3	3.00	1.0	1.60

COs	Target	Final CO attainment
CO1	2.50	1.57
CO2	2.30	1.52
CO3	2.40	1.55
CO4	2.50	1.56
CO5	2.30	1.60

If any Course Outcome is not attained, the Course Co-Ordinator and Course Instructor shall prepare Action Plan. Further Action must be initiated to improve the attainment of the respective CO, in the next Academic Year. Action Taken Report is to be prepared for the respective Course Outcome. Thus Course Outcome Attainment is improved.

7. Attainment of Program Outcomes
(CO-PO and CO-PSO Mapping)

The Attainment of Course Outcomes of all Theory courses, Laboratory Courses and Major Project work in all the semesters of four years B.Tech Program shall be collected. It is the basis of Program Outcome attainment.

In order to obtain the PO attainment of the respective program, both the Direct attainment and Indirect attainments are considered. The weightage for Direct attainment is 80%. The weightage for Indirect attainment is 20%.

Direct attainment is based on the performance of the students in the Internal Examinations, Assignment and end semester examinations of all the courses of the Program, from First year to Fourth Year of the UG Program. Direct attainment is obtained with the help of the CO attainment of all the courses of the Program, by considering the CP-PO articulation matrix and CO-PSO articulation matrix of each course.

Indirect attainment is based on the Feed backs given by the students on the Course outcomes and Program outcomes, known as Course Exit Survey, Program Exit Survey. Indirect attainment is also based on the Portfolio components.

The tools used for Indirect attainment
Course Exit Survey
Program Exit Survey
Co-Curricular Activities
Extra Curricular Activities
NSS and NCC participation
Placement and Higher Studies

Course Exit Survey is taken for each course at the end of all semesters. Program Exit Survey shall be taken at the end of the Program.

Co-Curricular Activities include participation of students in Industrial Visits, Internships, Field Trips, Workshops, Seminars, Conferences, Certification Programs, Online Certification Courses (NPTEL, MOOCS, etc..), participation in the events of Technical Symposium (Paper Presentation, Poster Presentation, Quiz, Project Expo, etc.), Journal Publications. Extra Curricular Activities include Sports and Games, Yoga, Cultural Activities.

Co-Curricular Activities, Extra Curricular Activities, NSS and NCC participation, Placement and Higher Studies are collectively called as Portfolio components.

The Course Exit Survey and Program Exit Survey shall be given 10% Weightage. The Portfolio components shall be given 10% Weightage.

Principal
Dr. Lankapalli Bullayya College of Engineering
D.No.52-14-75, Resapuvanipalem
Visakhapatnam-530013. Andhra Pradesh

Dr. LANKAPALLI BULLAYYA COLLEGE OF ENGINEERING
The Society For Collegiate Education
Affiliated to Andhra University, Approved by AICTE
52-14-75, Resapuvanipalem, Visakhapatnam - 530 013.
Ph : Off : 0891-2703293, 2703296
Email : principal@lbce.edu.in Website : www.lbce.edu.in

Attainment of Course Outcomes

Attainment of Course Outcomes through Cumulative Internal Examinations:

Class: III B.Tech ECE
Course: Digital Communications
Academic Year: 2021-2022
Course Instructor: K.V.Jaya Lakshmi

First MID Examination												
		1a	1b	1c	1d	1e	2a	2b	3a	3b	4a	4b
	Maximum Marks	2	2	2	2	2	7	7	7	7	6	6
S.No	Regd. No	CO1	CO1	CO1	CO1	CO2	CO1	CO1	CO1	CO1	CO2	CO2
1	316177112187	1.5	2	2	1.5	2	7		7		6	
2	319136412001	2	2	2	2	2	6		5		6	
3	319136412002	2	2	2	2	1	7		7		6	
4	319136412004	2	2	2	2	2	7			4	6	
5	319136412005	2	2	2	2	1	6		4		6	
6	319136412006	2	2	2	2	1		7	7		6	
7	319136412007	2	2	2	2			4		6	6	
8	319136412008	2	2	2	1	2	7			7	3	
9	319136412009	2	2	2	2	2	7		7		6	
10	319136412010	2	2	2	2	2	7		7		6	
11	319136412011	1	2	1	2	2	7					
12	319136412012	2	2	2	2		7					
13	319136412013	2	1	2	1	1	6			2		
14	319136412014	2	1	2	2		7				6	
15	319136412015	2	2	2	2	2		7			6	
16	319136412016	2	2	2	1	2	5				5	
17	319136412017	2	2	2	2	2	7		4		6	
18	319136412018	2	2	2	2	2	7		7		6	
19	319136412019	2	2	2	2	2	7			7	6	
20	319136412020	2	2	2	1	1	7			5	5	
21	319136412021	2	2	2	2	2	4				6	
22	319136412023	2	2	2	2	2	7					
23	319136412024	2	2				7		6			
24	319136412025	2	2	2	2	2	7		3		6	
25	319136412026	2	2	2	1	1	7		7		6	
26	319136412027	2	2	1	2		7					
27	319136412028	2	2	2	1	2	7		5		6	
28	319136412029	2	2	2			7		7		6	
29	319136412030		2	2		2	7		7		6	
30	319136412031	2	1	2	2	1	7			6	6	
31	319136412032	2	2	2		1	7		5		6	
32	319136412033	2	2	1	2	2				1	4	
33	319136412034	2	2	2			7			7	6	
34	319136412035	2	2	2	1	2	7			7	5	
35	319136412036	2	2	2	2	1	7		7		6	
36	319136412037	2	2	2	2	2	7			2	3	

37	319136412038	2	2	2	1	2	7					
38	319136412039	2	2	2	1	1	3				6	
39	319136412040	2	2	2	2	2	7			7	6	
40	319136412041	2	2	2	2	2	7		7		5	
41	319136412042	1	2	2	2	2	7			5	6	
42	319136412043	2	1	2	2	2	7				2	
43	319136412044	2	2	1	1	2	7				6	
44	319136412045	2	2	2	2	2	7				5	
45	319136412046	2	2	2	2	2	7		6	6	4	
46	319136412047	2	1	2	2	1	7		7	7	6	
47	319136412048	2	2	2	2	2	6		6		6	
48	319136412049	2	1	2	2	2	6		6	6	6	
49	319136412050	2	2	2			7		4	6		
50	319136412051	2	1	2	2	2	7			4	6	
51	319136412052	2	2	2	2	2	7		7		6	
52	319136412053	2	2	2	2	2	7			7	6	
53	319136412054	2	2	2	1		7				6	
54	319136412055	2	1	2		2	7				6	
55	319136412056	2	2	2	2	2	6		6		4	
56	319136412057	2	2	2			7			6	6	
57	319136412058	2	2	2	2	2	7		7		6	
58	319136412059	2	2	2	2		7			7	6	
59	319136412061	2	1	2	2	2	7				6	
60	319136412062	2	2	2	2	2	6				6	
61	319136412063	2	2	2	2	2	7				4	
62	319136412034	2	1	2	2	2	7				6	
63	319136412065	2	2	2	2	2	7		7		6	
64	319136412066	2	2	2	2	2	7			7	6	
65	319136412067	2	1	2	2	2	7		6		6	
66	319136412068	2	1	2	2	2	7			6	5	
67	319136412069	2	2	2	2	2	7		6		6	
68	319136412070	2	2	2	2	2	7			6	6	
69	319136412071	2	2	2	2	2	7		5		6	
70	319136412072	2	2	2	2	2	7		7	5	4	
71	319136412074	2	2	2	2	2	7		7	7	6	
72	319136412075	2	2	2	1	2		7	5	7	6	
73	319136412076	2	2	2	2	2	7		7	5	6	
74	319136412077	2	2	2	2	2	7			7	6	
75	319136412078	2	1	2	2	2	7				6	
76	319136412079	2	1	2	2	2	7		7		6	
77	319136412080	2	2	2	2	2	7		7	7	6	
78	319136412081	2	2	2	2	2	7		7	7	6	
		1a	1b	1c	1d	1e	2a	2b	3a	3b	4a	4b
	No of students (Attempted)	77	78	77	70	67	73	4	37	29	70	0
	No of students scored above 60% (Attained)	75	64	73	58	56	71	3	33	22	67	0
	Attainments%	97.40	82.05	94.80	82.85	83.58	97.26	75	89.18	75.86	95.71	0
	Attainment Level	3	3	3	3	3	3	2	3	2	3	0

37	319136412038	2	2	2	1	2	7					
38	319136412039	2	2	2	1	1	3				6	
39	319136412040	2	2	2	2	2	7			7	6	
40	319136412041	2	2	2	2	2	7		7		5	
41	319136412042	1	2	2	2	2	7			5	6	
42	319136412043	2	1	2	2	2	7	7			2	
43	319136412044	2	2	1	1	2	7	7			6	
44	319136412045	2	2	2	2	2	7	7			5	
45	319136412046	2	2	2	2	2	7	7		6	4	
46	319136412047	2	1	2	2	1	7	7		7	6	
47	319136412048	2	2	2	2	2	6	7			6	
48	319136412049	2	1	2	2	2	6	6		6	6	
49	319136412050	2	2	2			7	6		6		
50	319136412051	2	1	2	2	2	7	7		4	6	
51	319136412052	2	2	2	2	2	7	7			6	
52	319136412053	2	2	2	2	2	7	7		7	6	
53	319136412054	2	2	2	1		7	7			6	
54	319136412055	2	1	2		2	7	7			6	
55	319136412056	2	2	2	2	2	6	7			4	
56	319136412057	2	2	2			7	6		6	6	
57	319136412058	2	2	2	2	2	7	7			6	
58	319136412059	2	2	2	2		7	7		7	6	
59	319136412061	2	1	2	2	2	7	7			6	
60	319136412062	2	2	2	2	2	6	7			6	
61	319136412063	2	2	2	2	2	7	6			4	
62	319136412034	2	1	2	2	2	7	7			6	
63	319136412065	2	2	2	2	2	7	7			6	
64	319136412066	2	2	2	2	2	7	7		7	6	
65	319136412067	2	1	2	2	2	7	7			6	
66	319136412068	2	1	2	2	2	7	7		6	5	
67	319136412069	2	2	2	2	2	7	7			6	
68	319136412070	2	2	2	2	2	7	7		6	6	
69	319136412071	2	2	2	2	2	7	7			6	
70	319136412072	2	2	2	2	2	7	7		5	4	
71	319136412074	2	2	2	2	2	7	7		7	6	
72	319136412075	2	2	2	1	2		7		7	6	
73	319136412076	2	2	2	2	2	7		7	5	6	
74	319136412077	2	2	2	2	2	7	7		7	6	
75	319136412078	2	1	2	2	2	7	7			6	
76	319136412079	2	1	2	2	2	7	7			6	
77	319136412080	2	2	2	2	2	7	7		7	6	
78	319136412081	2	2	2	2	2	7	7		7	6	
		2	2	2	2		5	5		5		
		1a	1b	1c	1d	1e	2a	2b	3a	3b	4a	4b
	No of students (Attempted)	77	78	77	70	67	73	4	37	29	70	0
	No of students scored above 60% (Attained)	75	64	73	58	56	71	3	33	22	67	0
	Attainments%	97.40	82.05	94.80	82.85	83.58	97.26	75	89.18	75.86	95.71	0
	Attainment Level	3	3	3	3	3	3	2	3	2	3	0

Second MID Examination												
		1a	1b	1c	1d	1e	2a	2b	3a	3b	4a	4b
	Maximum Marks	2	2	2	2	2	7	7	7	7	6	6
S.No	Regd. No	CO3	CO3	CO3	CO4	CO4	CO3	CO3	CO3	CO3	CO4	CO4
1	316177112187	2	2	1	1	1	6			7		7
2	319136412001	1	2	2	2	1	6			7		
3	319136412002	2	1	1	1	2		6		7		6
4	319136412004	1	1	1	1	1	6			5		6
5	319136412005	1	1	1	2	2	6		7		7	
6	319136412006	1	1	1	1	1				6	6	
7	319136412007	2	2	1		2				7		6
8	319136412008	2	1		2	1	3				7	
9	319136412009	1	2	2	2	1		6		7		7
10	319136412010	2	1	2	1	2		6		7		7
11	319136412011	1	1	1	1	1	6			7	7	
12	319136412012	2	2	2	2	1	6		3			6
13	319136412013	2	2	1			6					3
14	319136412014	1	2	1	1	2		2		7		
15	319136412015	1	2	2	2	1				7		7
16	319136412016	1	2				6			5		
17	319136412017	1	2	2	2	1	6			7	7	
18	319136412018	1	2	2	2	2	6			7	7	
19	319136412019	2	2	2	2	2				7	7	
20	319136412020	1	2	1	1	2		6				7
21	319136412021	2	2	2	2	2		6			2	
22	319136412023	2	2	2	2	2						7
23	319136412024	1	1	2	1	2	5			4		6
24	319136412025	1	2	1	2	2	6			7		7
25	319136412026	1	1	2	1	1	6			7		5
26	319136412027	1	1	1	1	1	6			7		5
27	319136412028	1	2	2	2	1		6				7
28	319136412029	1	2	2	2	2		6		7		7
29	319136412030	2	2	2	2	2	5		2			7
30	319136412031	2	1	1	1	1	6			7	7	
31	319136412032	2		2	2		6			7		7
32	319136412033		2	2	2	2					7	
33	319136412034	2	2	1	2	2	6			7		7
34	319136412035	2	2	2	1	2	6			7		7
35	319136412036	2	2	2	2	2		6		7		7
36	319136412037	1	2			1	6			7	7	
37	319136412038			2			6					7
38	319136412039	1	2	2	2	2		2			7	
39	319136412040	2	1	1	2	2	2			6		7
40	319136412041	2	1	1	2	2	6			7		7
41	319136412042	1	2	2	2	2	6		7		7	
42	319136412043	2	2	1	2	2					7	
43	319136412044	2	1	2	1	2	6		2			
44	319136412045	2	2	2	2	2	5			7	7	
45	319136412046	1	2	1	1	1	6				7	
46	319136412047	2	2	2	1	1	6			7		7
47	319136412048	1	2	2	1	2				7	7	
48	319136412049		1	2	2	2		6		7		
49	319136412050			1	1		6					
50	319136412051		1	1	1	1	6			7		

51	319136412052	2	1	2	2	2	6			7		7
52	319136412053	2	1	2	2	1	6				6	
53	319136412054	2	2	1	1	1	2		3			7
54	319136412055	1	1	1	1	2				2		7
55	319136412056	1	1	1	1	1	6					6
56	319136412057	1	2	2	1	1	6		7		7	
57	319136412058	2	2	2	1	1	6			7	7	
58	319136412059	1	1	1	2	2	6			7		7
59	319136412061	2	1		1	2		6				7
60	319136412062			2		2	6					7
61	319136412063	2		2	2	2	6					7
62	319136412034	2	2	2	2	1		6		7		7
63	319136412065	2	2	1	2	1	6			7		7
64	319136412066	2	1	2	1	2		6		7		6
65	319136412067	2	1		2	2		6				7
66	319136412068	2	1	1	1	1	4		2			5
67	319136412069		2	1	1	1		6		7		7
68	319136412070	2	2	2	2	1		6		7		7
69	319136412071	2	2		1	1	6			5		4
70	319136412072	2	2	2	2	2		6		7		7
71	319136412074	2	2	2	2	2		6		7		7
72	319136412075	2	2	2	1	2		6		4		6
73	319136412076	2	2	2	2	2		6		7		7
74	319136412077		2	2	1	1		6		7		7
75	319136412078											
76	319136412079		1	2	2	1		6		7		7
77	319136412080	2	2	2	2	2		6		7	7	
78	319136412081	2	2	2	2	2		6		7		7
		1a	1b	1c	1d	1e	2a	2b	3a	3b	4a	4b
	No of students (Attempted)	68	72	71	71	72	43	25	8	51	21	49
	No of students scored above 60% (Attained)	41	46	44	40	41	39	23	3	48	20	48
	Attainments%	60.29	63.88	61.97	56.33	56.94	90.69	92	37.5	94.11	95.23	97.95
	Attainment Level	1	1	1	1	1	3	3	1	3	3	3
		1a	1b	1c	1d	1e	2a	2b	3a	3b	4a	4b

Course Outcomes Attainment using Mid Examinations:

	Mid Questions		Internal Examinations Attainment			
			CO1	CO2	CO3	CO4
Part-1A	Q1	1a	3			
		1b	3			
		1c	3			
		1d		3		
		1e		3		
Part-1B	Q2	2a	3			
		2b	2			
	Q3	3a	3			
		3b	2			
	Q4	4a		3		
		4b		0		
Part-2A	Q1	1a			1	
		1b			1	
		1c			1	
		1d				1
		1e				1
Part-2B	Q2	2a			3	
		2b			3	
	Q3	3a			1	
		3b			3	
	Q4	4a				3
		4b				3
		Average	2.71	2.25	1.86	2

Course Outcomes Attainment using Assignments:

Class: III B.Tech ECE
Course: Digital Communications
Academic Year: 2021-2022
Course Instructor: K.V.Jaya Lakshmi

S.No	Roll. Number	Assignment Marks	
		A1	A2
		5 Marks	5 Marks
		CO1-CO2	CO3-CO4
1	316177112187	5	5
2	319136412001	5	5
3	319136412002	5	5
4	319136412004	5	5
5	319136412005	5	5
6	319136412006	5	5
7	319136412007	5	5
8	319136412008	5	5
9	319136412009	5	5
10	319136412010	5	5
11	319136412011	5	5
12	319136412012	5	5
13	319136412013	5	5
14	319136412014	5	5
15	319136412015	5	5
16	319136412016	5	5
17	319136412017	5	5
18	319136412018	5	5
19	319136412019	5	5
20	319136412020	5	5
21	319136412021	5	5
22	319136412023	5	5
23	319136412024	5	5
24	319136412025	5	5
25	319136412026	5	5
26	319136412027	5	5
27	319136412028	5	5
28	319136412029	5	5
29	319136412030	5	5
30	319136412031	5	5
31	319136412032	5	5
32	319136412033	5	5
33	319136412034	5	5
34	319136412035	5	5
35	319136412036	5	5
36	319136412037	5	5
37	319136412038	5	5
38	319136412039	5	5
39	319136412040	5	5

40	319136412041	5	5
41	319136412042	5	5
42	319136412043	5	5
43	319136412044	5	5
44	319136412045	5	5
45	319136412046	5	5
46	319136412047	5	5
47	319136412048	5	5
48	319136412049	5	5
49	319136412050	5	5
50	319136412051	5	5
51	319136412052	5	5
52	319136412053	5	5
53	319136412054	5	5
54	319136412055	5	5
55	319136412056	5	5
56	319136412057	5	5
57	319136412058	5	5
58	319136412059	5	5
59	319136412061	5	5
60	319136412062	5	5
61	319136412063	5	5
62	319136412034	5	5
63	319136412065	5	5
64	319136412066	5	5
65	319136412067	5	5
66	319136412068	5	5
67	319136412069	5	5
68	319136412070	5	5
69	319136412071	5	5
70	319136412072	5	5
71	319136412074	5	5
72	319136412075	5	5
73	319136412076	5	5
74	319136412077	5	5
75	319136412078	5	5
76	319136412079	5	5
77	319136412080	5	5
78	319136412081	5	5
	No of students Attempted	78	78
	No of students Scored above 60%	78	78
	Attainments%	100	100
	Attainment Level	3	3

Course Outcomes Attainment using Semester END Examination Results:

Class: III B.Tech ECE

Course: Digital Communications

Academic Year: 2021-2022

Course Instructor: K.V.Jaya Lakshmi

Semester END Examination Results			
S.No	Roll Number	Grade Points	Grades
1	316177112187	8	A
2	319136412001	0	F
3	319136412002	8	A
4	319136412004	6	B
5	319136412005	7	B+
6	319136412006	6	B
7	319136412007	7	B+
8	319136412008	5	C
9	319136412009	8	A
10	319136412010	8	A
11	319136412011	7	B+
12	319136412012	5	C
13	319136412013	0	F
14	319136412014	5	C
15	319136412015	7	B+
16	319136412016	5	C
17	319136412017	6	B
18	319136412018	8	A
19	319136412019	8	A
20	319136412020	7	B+
21	319136412021	5	C
22	319136412023	5	C
23	319136412024	6	B
24	319136412025	6	B
25	319136412026	6	B
26	319136412027	6	B
27	319136412028	7	B+
28	319136412029	7	B+
29	319136412030	7	B+
30	319136412031	7	B
31	319136412032	7	B+
32	319136412033	4	P
33	319136412034	6	B
34	319136412035	7	B+
35	319136412036	8	A
36	319136412037	5	C
37	319136412038	5	C
38	319136412039	5	C
39	319136412040	9	A+
40	319136412041	7	B+
41	319136412042	7	B+
42	319136412043	4	P

43	319136412044	5	C
44	319136412045	6	B
45	319136412046	6	B
46	319136412047	7	B+
47	319136412048	7	B+
48	319136412049	7	B+
49	319136412050	4	P
50	319136412051	6	B
51	319136412052	10	A+
52	319136412053	5	C
53	319136412054	7	B+
54	319136412055	5	C
55	319136412056	5	C
56	319136412057	6	B
57	319136412058	7	B+
58	319136412059	8	A
59	319136412061	6	B
60	319136412062	5	C
61	319136412063	6	B
62	319136412034	7	B+
63	319136412065	7	B+
64	319136412066	8	A
65	319136412067	6	B
66	319136412068	6	B
67	319136412069	7	B+
68	319136412070	8	A
69	319136412071	6	B
70	319136412072	8	A
71	319136412074	9	A+
72	319136412075	7	B+
73	319136412076	7	B+
74	319136412077	8	A
75	319136412078	5	C
76	319136412079	6	B
77	319136412080	8	A
78	319136412081	8	A
	No of students Attempted	78	78
	No of students Attained (Grade Points>=6)	58	58
	Attainment %	74.36	74.36
	Attainment Level	2	2

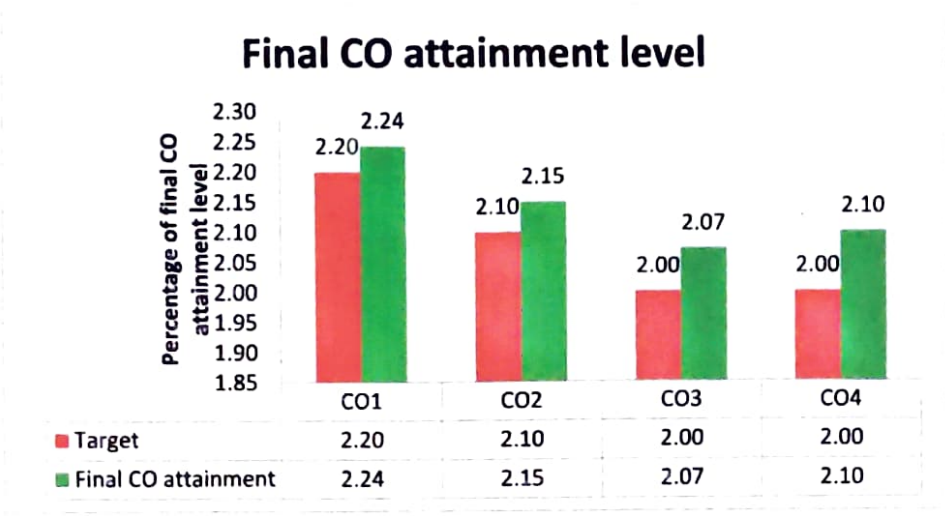
Overall Course Outcomes Attainment:

Class: III B.Tech ECE
Course: Digital Communications
Academic Year: 2021-2022
Course Instructor: K.V.Jaya Lakshmi

Examination Grades of Andhra University, Visakhapatnam			
Grade	Grade Points	Grade description	Required Percentage of Marks
O	10	Out Standing	90% to 100%
A+	9	Excellent	80% to 90%
A	8	Very Good	70% to 80%
B+	7	Good	60% to 70%
B	6	Above Average	55% to 60%
C	5	Average	50% to 55%
P	4	Pass	40% to 50%
F	0	Fail	Less than 40%

Overall Course Outcomes Attainment				
COs	Mid Exams	Assignments	Semester End Exam	Final CO Attainment
CO1	2.71	3.00	2.0	2.24
CO2	2.25	3.00	2.0	2.15
CO3	1.86	3.00	2.0	2.07
CO4	2	3.00	2.0	2.10

COs	Target	Final CO attainment
CO1	2.20	2.24
CO2	2.10	2.15
CO3	2.00	2.07
CO4	2.00	2.10



Principal
Dr. Lankapalli Bullayya College of Engineering
D.No.52-14-75, Resapuvanipalem
Visakhapatnam-530013. Andhra Pradesh

Dr. Lankapalli Bullayya College of Engineering (for Women)
(Sponsored by The Society for Collegiate Education, Visakhapatnam, A.P.)
Affiliated to Andhra University & Approved by AICTE
D.No. 52-14-75, Resapuvanipalem, Visakhapatnam-530 013. A.P.
Tel : +91 891 2703293, 2703296 / Fax : +91 891 2714423,
E-mail : lbcenggprincipal@gmail.com Website : www.bullayyacollege.info

Regulation : 2019-2020 Department: Electronics and Communication Engineering

S.NO	Course	COs	Attainment	% Attainment	POs												PSOs	
					1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Mathematics-I	CO1	1.6	53	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO2	1.6	53	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO3	1.55	52	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO4	1.52	51	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO5	1.6	53	2	2	-	-	-	-	-	-	1	-	-	2	2	-
2	Mathematics-II	CO1	1.59	53	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO2	1.58	53	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO3	1.55	52	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO4	1.52	51	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO5	1.6	53	2	2	-	-	-	-	-	-	1	-	-	2	2	-
3	Physics	CO1	1	33	2	2	-	-	-	-	-	-	-	-	-	-	-	1
		CO2	1.5	50	2	2	1	2	-	-	-	-	-	-	-	-	-	-
		CO3	1.5	50	2	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	1.45	48	-	-	-	2	1	-	-	-	-	-	-	-	-	2
		CO5	1.6	53	-	-	-	-	-	-	-	-	-	-	-	1	-	1
4	Engineering Graphics	CO1	1.57	52	3	-	-	-	3	-	-	-	-	-	-	-	-	-
		CO2	1.36	45	3	2	-	-	3	-	-	-	-	-	-	-	-	-

		CO3	1.60	53	3	2	-	-	3	-	-	-	-	-	-	-	-	-	-
		CO4	1.48	49	3	2	-	-	3	-	-	-	-	-	-	-	-	-	-
		CO5	1.30	43	3	2	-	-	3	-	-	-	-	-	-	-	-	-	-
5	Professional Ethics & Moral Values	CO1	2.91	97	3	3	2	-	2	-	-	-	1	-	-	2	3	2	
		CO2	3	100	2	2	2	-	2	-	-	-	1	-	-	2	2	2	
		CO3	2.8	93	2	2	3	1	2	1	-	-	1	1	-	2	2	2	
		CO4	2.91	97	2	2	3	1	2	1	2	1	2	2	1	2	2	2	
6	Physics Lab	CO1	2.8	93	2	1	-	3	3	-	1	1	2	1	2	1	-	-	
		CO2	2.8	93	2	1	-	3	2	-	1	1	2	1	2	1	-	-	
		CO3	2.8	93	2	1	-	3	3	-	1	1	2	1	2	1	-	-	
7	Workshop	CO1	3	100	2	-	-	-	1	-	-	-	1	-	-	-	-	-	
		CO2	3	100	2	-	-	-	1	-	-	-	1	-	-	-	-	-	
		CO3	3	100	2	-	-	-	1	-	-	-	1	-	-	-	-	-	
		CO4	3	100	2	-	-	-	1	-	-	-	1	-	-	-	-	-	
8	Mathematics-III	CO1	1.6	53	2	2	-	-	-	-	-	-	1	-	-	2	2	-	
		CO2	1.6	53	2	2	-	-	-	-	-	-	1	-	-	2	2	-	
		CO3	1.55	52	2	2	-	-	-	-	-	-	1	-	-	2	2	-	
		CO4	1.52	51	2	2	-	-	-	-	-	-	1	-	-	2	2	-	
		CO5	1.6	53	2	2	-	-	-	-	-	-	1	-	-	2	2	-	
9	Chemistry	CO1	2.2	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CO2	2.33	78	-	-	1	-	1	-	1	2	-	-	-	-	-	-	
		CO3	2.33	78	-	-	1	-	1	-	1	1	-	-	-	-	-	-	
		CO4	2.33	78	-	-	1	-	1	-	1	1	-	-	-	-	-	-	
		CO5	2.33	78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	Computer	CO1	1.43	48	2	2	2	1	2	-	-	-	1	2	2	3	1	-	

	Programming and Numerical Methods	CO2	1.39	46	2	2	2	1	2	-	-	-	1	2	2	1	-	1
		CO3	1.57	52	2	1	2	1	2	-	-	-	1	2	2	1	-	1
		CO4	1.48	49	2	2	2	1	2	-	-	-	1	2	2	1	-	-
11	Basic Electronics Engineering	CO1	2.7	90	2	3	1	-	-	3	1	-	-	-	-	1	2	-
		CO2	3	100	2	1	2	1	-	3	1	-	-	-	-	-	1	-
		CO3	3	100	3	1	1	-	-	-	1	-	-	-	-	-	-	-
		CO4	3	100	1	3	-	-	-	-	-	-	-	-	-	1	1	-
12	Essence of Indian Traditional Knowledge	CO1	2.8	93	1	-	-	1	-	3	2	3	-	-	-	1	-	1
		CO2	3	100	1	1	2	2	2	2	2	1	-	-	2	2	-	2
		CO3	3	100	1	1	2	2	3	2	2	2	1	1	2	2	-	1
		CO4	3	100	1	2	2	2	2	1	2	2	2	1	2	2	-	2
13	English	CO1	3	100	-	-	1	1	1	1	1	2	2	3	1	2	-	1
		CO2	3	97	-	-	1	1	1	1	1	2	2	3	1	2	-	1
		CO3	3	100	-	-	1	1	1	1	1	2	3	3	1	1	-	1
		CO4	3	100	-	-	1	1	1	1	1	2	2	3	1	2	-	1
14	Chemistry Lab	CO1	3	100	-	-	2	1	1	1	1	-	-	-	-	-	-	-
		CO2	3	100	-	-	2	1	1	1	1	-	-	-	-	-	-	-
		CO3	3	100	-	-	2	1	1	1	1	-	-	-	-	-	-	-
15	Computer Programming and Numerical Methods Lab	CO1	3	100	2	2	2	-	2	-	-	-	1	-	-	2	2	-
		CO2	3	100	2	2	3	1	2	1	-	-	1	1	-	2	2	1
		CO3	3	100	2	2	3	1	2	1	-	-	-	-	-	2	2	-
		CO4	3	100	2	2	-	1	1	1	-	-	1	1	1	2	2	-
16	MathematicsIV	CO1	2.7	90	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO2	2.2	73	2	2	-	-	-	-	-	-	1	-	-	2	2	-

		CO3	1.9	63	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO4	2.8	93	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO5	1.8	60	2	2	-	-	-	-	-	-	1	-	-	2	2	-
17	Network theory Analysis	CO1	2.3	77	2	2	-	-	-	-	-	-	-	-	-	-	1	1
		CO2	1.8	60	2	2	-	-	-	-	-	-	-	-	-	-	1	1
		CO3	2.5	83	2	2	-	-	-	-	-	-	-	-	-	-	1	1
		CO4	3	100	2	2	-	-	-	-	-	-	-	-	-	-	1	1
		CO5	3	100	2	2	-	-	-	-	-	-	-	-	-	-	1	1
18	Electrical Machines	CO1	2.8	93	3	3	-	-	-	-	-	-	-	-	-	-	1	1
		CO2	2.8	93	3	3	-	-	-	-	-	-	-	-	-	-	1	1
		CO3	2.8	93	3	3	-	-	-	-	-	-	-	-	-	-	1	1
		CO4	2.8	93	3	3	-	-	-	-	-	-	-	-	-	-	1	1
19	Electronic Devices and Circuits	CO1	2.25	75	3	3	-	-	-	-	-	-	-	-	-	-	3	3
		CO2	1.75	58	3	3	1	1	-	-	-	-	-	-	-	-	3	3
		CO3	2	67	3	3	2	1	-	-	-	-	-	-	-	2	3	3
		CO4	3	100	3	3	2	2	-	-	-	-	-	-	-	2	3	3
		CO5	2.75	92	3	3	2	-	-	-	-	-	-	-	-	1	3	3
		CO6	3	100	3	3	2	2	-	-	-	-	-	-	-	1	3	3
20	Switching Theory and Logic Design	CO1	2.66	89	3	2	2	2	2	2	-	-	2	1	-	1	2	2
		CO2	2.8	93	3	2	2	2	2	2	-	-	2	1	-	2	2	3
		CO3	3	100	2	3	2	2	2	2	-	-	3	2	-	1	2	2
		CO4	2.84	95	3	2	3	3	3	1	-	-	3	1	-	1	3	3
		CO5	2.7	90	3	2	3	3	3	1	-	-	3	1	-	1	3	3
21	Data Structures	CO1	1.5	50	3	1	2	-	2	-	-	-	1	-	-	1	2	3
		CO2	1.46	49	2	3	1	-	2	-	-	-	1	-	-	1	2	2

		CO3	1.4	47	3	1	2	-	2	-	-	-	1	-	-	1	3	2
		CO4	1.4	47	3	1	2	-	1	-	-	-	1	-	-	1	2	2
		CO5	1.4	47	3	1	2	-	1	-	-	-	1	-	-	1	2	2
22	Network and Machines Lab	CO1	3	100	2	2	-	-	-	-	-	-	-	-	-	-	1	1
		CO2	3	100	2	2	-	-	-	-	-	-	-	-	-	-	1	1
		CO3	3	100	2	2	-	-	-	-	-	-	-	-	-	-	1	1
		CO4	3	100	2	2	-	-	-	-	-	-	-	-	-	-	1	1
23	Electronic Devices & Circuits Lab	CO1	3	100	3	3	2	3	3	-	-	-	-	3	-	3	3	2
		CO2	3	100	3	3	2	3	3	-	-	-	-	3	-	3	3	2
		CO3	3	100	3	3	2	3	3	-	-	-	-	3	-	3	3	2
		CO4	3	100	3	3	2	3	3	-	-	-	-	3	-	3	3	2
24	MathematicsV	CO1	1.78	59	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO2	1.65	55	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO3	1.36	45	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO4	1.47	49	2	2	-	-	-	-	-	-	1	-	-	2	2	-
		CO5	1.63	54	2	2	-	-	-	-	-	-	1	-	-	2	2	-
25	Electromagnetic Field Theory & Transmission Lines	CO1	2.95	98	3	2	1	1	-	-	-	-	-	-	-	1	1	-
		CO2	2.93	98	3	2	1	1	-	-	-	-	-	-	-	1	1	-
		CO3	2.95	98	2	2	1	1	-	-	-	-	-	-	-	2	2	-
		CO4	3	100	2	3	2	1	-	-	-	-	-	-	-	2	2	-
		CO5	3	100	2	3	2	1	-	-	-	-	-	-	-	1	2	-
26	Analog Electronic Circuits	CO1	2.5	83	3	3	-	-	-	-	-	-	-	-	-	-	3	3
		CO2	1.75	58	3	3	1	1	-	-	-	-	-	-	-	-	3	3
		CO3	2.33	78	3	3	2	1	-	-	-	-	-	-	-	2	3	3
		CO4	3	100	3	3	2	2	-	-	-	-	-	-	-	2	3	3

		CO5	2.75	92	3	3	2	-	-	-	-	-	-	-	-	1	3	3
		CO6	3	100	3	3	2	2	-	-	-	-	-	-	-	1	3	3
27	Probability Theory and Random Processes	CO1	1.6	53	3	2	1	-	-	-	-	-	-	-	-	1	1	-
		CO2	1.48	49	3	2	1	-	-	-	-	-	-	-	-	2	2	-
		CO3	1.6	53	1	2	1	-	-	-	-	-	-	-	-	2	3	-
		CO4	1.6	53	3	2	1	-	-	-	-	-	-	-	-	1	2	-
		CO5	1.6	53	1	2	1	-	-	-	-	-	-	-	-	1	2	-
28	Signals & Systems	CO1	3	100	3	2	1	-	-	-	-	-	-	2	-	-	2	2
		CO2	3	100	3	3	2	2	-	-	-	-	-	2	-	-	2	2
		CO3	3	100	3	3	2	-	-	-	-	-	-	2	-	-	2	2
		CO4	3	100	3	2	2	2	-	-	-	-	-	-	-	-	2	2
		CO5	3	100	3	2	-	2	-	-	-	-	-	-	-	-	2	2
29	Environmental Studies	CO1	3	100	1	1	1	1	1	1	3	-	-	-	-	-	1	-
		CO2	3	100	1	1	1	1	1	1	3	-	-	-	-	-	1	-
		CO3	3	100	1	1	1	1	1	1	3	-	-	-	-	-	1	-
30	Digital IC’s and HDL Lab	CO1	3	100	3	3	3	3	3	-	-	-	-	-	-	3	3	3
		CO2	3	100	3	3	3	3	3	-	-	-	-	-	-	3	3	3
		CO3	3	100	3	3	3	3	3	-	-	-	-	-	-	3	3	3
		CO4	3	100	3	3	3	3	3	-	-	-	-	-	-	3	3	3
31	Analog Electronic & Circuits Lab with Simulation	CO1	3	100	3	3	2	3	3	-	-	-	-	-	-	3	3	2
		CO2	3	100	3	3	2	3	3	-	-	-	-	-	-	3	3	2
		CO3	3	100	3	3	3	3	3	-	-	-	-	-	-	3	3	3
		CO4	3	100	3	3	2	3	3	-	-	-	-	-	-	3	3	2
32	Linear ICs & Applications	CO1	2.05	68	3	3	2	2	-	1	1	-	-	-	-	-	3	3
		CO2	2.02	67	3	3	2	-	-	1	1	-	-	-	-	-	3	3

		CO3	2.23	74	3	3	2	1	1	1	1	-	-	-	-	-	3	3
		CO4	2.3	77	3	3	2	1	-	1	1	-	-	-	-	-	3	3
		CO5	2.3	77	3	3	2	1	1	1	1	-	-	-	-	-	3	3
33	Analog Communications	CO1	3	100	3	2	1	3	–	–	–	–	–	–	–	–	2	2
		CO2	3	100	3	2	1	1	3	–	–	3	2	–	–	2	2	2
		CO3	3	100	3	2	-	-	-	-	-	-	-	-	-	2	2	2
		CO4	3	100	3	3	2	1	3	–	–	3	2	–	–	2	2	2
		CO5	3	100	3	2	1	3	3	–	–	3	–	–	–	2	2	2
34	OOPS	CO1	2.3	77	3	3	2	-	2	-	-	-	1	-	-	2	3	2
		CO2	2.3	77	2	2	2	-	2	-	-	-	1	-	-	2	2	2
		CO3	2.3	77	2	2	3	1	2	1	-	-	1	1	-	2	2	2
		CO4	2.3	77	2	2	3	1	2	1	-	-	-	-	-	2	2	2
		CO5	2.3	77	2	2	2	-	2	-	-	-	1	-	-	2	2	2
35	Antennas &Wave Propagation	CO1	2.25	75	3	3	-	2	-	-	-	-	-	-	-	2	1	-
		CO2	2.5	83	3	2	1	2	-	-	-	-	-	-	-	2	2	-
		CO3	3	100	3	3	2	3	-	-	-	-	-	-	-	1	3	-
		CO4	3	100	3	3	-	-	-	-	-	-	-	-	-	2	2	-
		CO5	2.75	92	3	3	2	2	-	-	-	-	-	-	-	2	2	-
		CO6	3	100	3	2	2	2	-	-	-	-	-	-	-	2	2	-
36	Pulse and Digital Circuits	CO1	1.9	63	3	3	3	3	3	-	-	-	-	-	2	1	2	2
		CO2	1.9	63	3	3	2	2	2	3	-	-	-	-	1	1	2	2
		CO3	1.96	65	3	3	3	3	3	3	-	-	-	-	2	1	2	2
		CO4	2.1	70	3	3	3	3	3	3	-	-	-	-	1	1	2	2
		CO5	2.16	72	3	3	3	3	3	3	-	-	-	-	2	1	2	2
37	Digital Signal	CO1	1.27	42	3	3	3	3	3	-	-	-	-	-	2	1	2	2

	Processing	CO2	1.32	44	3	3	2	2	2	3	-	-	-	-	1	1	2	3
		CO3	1.55	52	3	3	3	3	3	3	-	-	-	-	2	1	2	2
		CO4	1.56	52	3	3	3	3	3	3	-	-	-	-	1	1	2	2
		CO5	1.6	53	3	3	3	3	2	3	1	1	-	1	2	1	2	2
38	Soft Skills	CO1	3	100	-	-	-	-	2	1	-	2	2	3	-	2	-	-
		CO2	3	100	-	-	1	-	2	1	-	2	2	3	-	1	-	-
		CO3	3	100	-	-	1	-	2	2	2	2	2	3	-	2	-	1
		CO4	3	100	-	-	1	-	2	1	2	2	2	3	-	2	-	-
39	Linear ICs & Pulse Circuit Lab	CO1	3	100	3	3	3	3	3	-	-	-	-	-	-	3	3	3
		CO2	3	100	3	3	3	3	3	-	-	-	-	-	-	3	3	3
		CO3	3	100	3	3	2	3	3	-	-	-	-	-	-	3	3	2
		CO4	3	100	3	3	3	3	3	-	-	-	-	-	-	3	3	3
40	Analog Communications Lab	CO1	3	100	2	3	2	-	1	1	-	-	2	2	1	-	2	2
		CO2	3	100	3	3	3	-	1	1	-	-	2	2	1	-	2	2
		CO3	3	100	3	2	1	-	1	1	-	-	2	2	1	-	2	2
		CO4	3	100	3	2	2	-	1	1	-	-	2	2	1	-	2	2
		CO5	3	100	3	2	2	-	1	1	-	-	2	2	1	-	2	2
41	Computer Network Engineering	CO1	2.97	99	2	2	3	1	2	1	2	1	2	2	1	2	2	2
		CO2	2.83	94	2	2	3	1	2	1	-	-	-	-	-	2	2	2
		CO3	3	100	2	2	3	-	-	-	-	-	-	-	-	2	3	2
		CO4	2.9	97	2	2	3	1	-	1	-	-	-	-	-	2	-	2
		CO5	2.9	97	2	2	3	1	2	1	-	-	-	-	-	2	2	2
42	Micro Processor & Micro	CO1	2.85	95	1	-	-	-	-	-	-	-	-	-	-	1	1	-
		CO2	2.8	93	2	2	2	-	-	-	-	-	-	-	-	2	2	-
		CO3	3	100	2	2	3	-	-	-	-	-	-	-	-	2	3	-

	Controllers	CO4	2.97	99	1	1	-	-	-	-	-	-	-	-	-	1	2	-
43	Digital Communications	CO1	2.94	98	3	3	2	3	3	-	-	-	-	-	-	3	3	2
		CO2	2.96	99	3	3	2	3	3	-	-	-	-	-	-	3	3	2
		CO3	2.96	99	1	1	1	1	1	-	-	-	-	-	-	3	1	1
		CO4	3	100	3	3	2	3	3	-	-	-	-	-	-	3	3	2
44	Wireless Sensor Networks	CO1	1.4	47	3	1	1	-	-	-	-	-	-	-	-	1	1	2
		CO2	1.3	43	3	3	2	2	-	3	-	2	-	-	2	2	3	2
		CO3	1.29	43	1	3	2	-	-	-	-	-	-	-	-	2	2	1
		CO4	1.24	41	1	2	1	-	-	-	-	-	-	-	-	1	1	2
		CO5	1.4	47	3	2	-	2	-	-	-	1	1	1	-	-	2	1
		CO6	1.41	47	2	1	2	2	2	-	-	-	1	1	-	1	3	3
45	Digital Image Processing	CO1	2.94	98	1	1	1	-	-	-	-	-	-	-	1	-	-	3
		CO2	2.96	99	2	3	2	1	-	-	-	-	-	-	1	-	-	3
		CO3	2.96	99	3	3	3	2	-	-	-	-	-	-	1	-	-	3
		CO4	3	100	3	3	2	2	-	-	-	-	-	-	1	2	-	3
46	Control Systems	CO1	2.9	97	1	-	-	-	-	-	-	-	-	-	-	1	1	-
		CO2	2.76	92	2	2	2	-	-	-	-	-	-	-	-	2	2	-
		CO3	2.9	97	2	2	3	-	-	-	-	-	-	-	-	2	3	-
		CO4	3	100	1	1	-	-	-	-	-	-	-	-	-	1	2	-
		CO5	3	100	1	1	-	-	-	-	-	-	-	-	-	1	2	-
47	Cellular and Mobile Communication	CO1	2.3	77	3	2	1	3	-	-	1	-	-	-	-	2	2	2
		CO2	2.25	75	2	3	3	-	-	-	-	-	-	1	2	2	2	3
		CO3	2.17	72	3	1	1	2	-	-	-	-	-	-	-	-	2	2
		CO4	2.1	70	3	1	1	1	-	-	-	-	-	1	2	1	2	2
		CO5	2.2	73	2	3	3	2	3	-	-	-	-	-	2	1	2	3

48	DSP Lab	CO1	3	100	3	3	2	3	3	-	-	-	1	1	-	-	3	2
		CO2	3	100	3	3	2	3	3	-	-	-	1	1	-	-	3	2
		CO3	3	100	3	2	2	3	3	-	-	-	1	1	-	-	3	2
		CO4	3	100	3	3	3	3	3	-	-	-	1	1	1	-	3	2
		CO-5	0	0	2	1	-	2	-	1	-	-	1	1	-	-	3	2
49	Microprocessor & Micro Controllers Lab	CO1	3	100	3	2	-	-	-	-	-	-	-	-	-	-	3	2
		CO2	3	100	3	2	2	-	-	-	-	-	-	-	-	-	3	2
		CO3	3	100	3	2	-	-	-	-	-	-	-	-	-	-	3	2
		CO4	3	100	3	2	-	-	-	-	-	-	-	-	-	-	3	2
		CO5	3	100	3	2	-	-	3	-	-	-	-	-	-	-	3	2
50	Principles of Economics & Management	CO1	2.77	92	1	-	-	-	-	-	-	-	-	-	-	1	1	1
		CO2	2.9	97	2	2	2	-	-	-	-	-	-	-	-	2	2	-
		CO3	3	100	2	2	3	-	-	-	-	-	-	-	-	2	3	-
		CO4	2.97	99	1	1	-	-	-	-	-	-	-	-	-	1	2	-
51	Information Coding and Design	CO1	3	100	3	3	2	3	3	-	-	-	-	-	-	3	3	2
		CO2	2.7	90	3	3	2	3	3	-	-	-	-	-	-	3	3	2
		CO3	3	100	1	1	1	1	1	-	-	-	-	-	-	3	1	1
		CO4	3	100	3	3	2	3	3	-	-	-	-	-	-	3	3	2
52	VLSI Design	CO1	2.97	99	1	-	-	-	-	-	-	-	-	-	-	1	2	2
		CO2	2.9	97	2	2	2	-	-	-	-	-	-	-	-	-	2	2
		CO3	2.8	93	2	2	3	-	-	-	-	-	-	-	-	-	2	2
		CO4	3	100	1	1	-	-	-	-	-	-	-	-	-	-	2	2
		CO5	3	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	Microwave Engineering	CO1	2.6	87	2	2	1	1	2	-	-	-	-	-	2	1	3	3
		CO2	2.6	87	1	3	2	2	2	3	-	-	-	-	1	1	3	3

		CO3	2.66	89	2	2	3	3	3	2	-	-	-	-	2	1	3	3
		CO4	2.8	93	2	2	2	1	1	3	-	-	-	-	1	1	3	3
		CO5	2.86	95	2	1	2	2	1	3	-	-	-	-	2	1	3	3
54	Radar Engineering	CO1	2.97	99	1	2	1	2	1	2	3	-	2	1	2	1	1	2
		CO2	2.96	99	2	2	2	1	2	3	1	-	2	1	2	2	2	2
		CO3	3	100	2	3	2	2	2	1	2	-	1	2	1	2	3	3
		CO4	3	100	1	3	3	2	1	1	1	-	2	3	3	1	2	2
55	Bio Medical Signal Processing	CO1	2.77	92	1	1	1	1	-	-	-	-	-	-	-	1	-	-
		CO2	2.8	93	3	2	1	1	-	-	-	-	-	-	-	2	-	-
		CO3	2.9	97	3	2	1	1	-	-	-	-	-	-	-	1	-	-
		CO4	2.84	95	3	2	1	1	-	-	-	-	-	-	-	2	-	-
		CO5	3	100	1	3	3	2	1	1	1	-	2	3	3	1	2	2
56	Artificial Neural Networks	CO1	2.87	96	3	2	2	-	2	-	-	2	-	-	-	-	-	-
		CO2	2.88	96	3	2	2	2	2	-	-	-	-	-	-	-	-	-
		CO3	2.9	97	3	2	2	3	-	-	-	-	-	-	-	-	-	-
		CO4	2.88	96	3	2	1	-	-	-	-	-	-	-	-	-	-	-
		CO5	2.8	93	3	2	1	-	-	-	-	2	-	-	-	-	-	-
57	Digital Communication Lab	CO1	3	100	3	3	3	3	3	-	-	-	-	-	-	3	3	3
		CO2	3	100	3	3	2	3	3	-	-	-	-	-	-	3	3	2
		CO3	3	100	3	3	3	3	3	-	-	-	-	-	-	3	3	3
		CO4	3	100	3	3	2	3	3	-	-	-	-	-	-	3	3	2
58	Micro Wave Engg. Lab	CO1	3	100	2	-	3	-	2	-	-	-	2	1	-	-	2	3
		CO2	3	100	2	-	3	-	2	-	-	-	2	1	-	-	2	3
		CO3	3	100	2	-	3	-	2	-	-	-	2	1	-	-	2	3
		CO4	3	100	2	-	3	-	2	-	-	-	2	1	-	-	2	3

		CO5	3	100	2	-	3	-	2	-	-	-	2	1	-	-	2	3
59	Project work	CO1	3	100	2	3	2	1	2	2	2	1	3	2	3	1	2	3
		CO2	3	100	2	3	2	1	2	2	2	1	3	2	3	1	2	3
		CO3	3	100	2	3	2	1	2	2	2	1	3	2	3	1	2	3
		CO4	3	100	2	3	2	1	2	2	2	1	3	2	3	1	2	3
PO Attainment					84	84	87.6	87.4	86	80	84	80.1	80	84	72.4	81.9	84	87

Dr. Lankapalli Bullayya College of Engineering for Women
Survey No. 44
D. No: 52-14-75
Resapuvanipalem
Visakhapatnam 13

Principal
Dr. Lankapalli Bullayya College of
Engineering for Women
Survey No. 44, D. No. 52-14-75,
Resapuvanipalem, Visakhapatnam-530013