1. Program Outcomes (POs)

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, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering
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 modelling 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 dependent and life-long learning in the broadest context of technological change.

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirlos
Motors, Bidadi, Bangalore - 5[illegible]09

2. Program Specific Outcomes (PSO'S)

1. Solve the Engineering problems of Electronics & Communication Engineering in VLSI design, Embedded Systems, Communication Engineering
2. Demonstrate programming skills using assembly and high-level languages to solve Electronics and Communication Engineering problems.
3. Demonstrate proficiency in use of software and hardware required in real life applications.

Amruta Institute of Engineering & Management Sciences
BIDADI

PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar
Motors, Bidadi, Bangalore - 562109

3. Course Outcomes (COs)

The following tables list the course outcomes and CO-PO-PSO of one course from each semester from 3rd to 8th semester of 2023 passed out batch.

CODE:18MAT31	SUBJECT: TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	SEMESTER:III
CO	**CO Statement**	
18MAT31.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.	
18MAT31.2	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory	
18MAT31.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.	
18MAT31.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.	
18MAT31.5	Determine the extremals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.	

CO	PO												PSO			CO TARGET
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
18MAT31.1	3	2														2.5
18MAT31.2	3	2														2.5
18MAT31.3	3	2														2.5
18MAT31.4	3	3														3
18MAT31.5	3	3														3
PO TARGET	**3**	**2.5**														

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore - 562109

CODE:18MAT41	SUBJECT: COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS	SEMESTER:IV
CO	**CO Statement**	
18MAT41.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.	
18MAT41.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing	
18MAT41.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.	
18MAT41.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.	
18MAT41.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.	

CO	PO												PSO			CO TARGET
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
18MAT41.1	3	2														2.5
18MAT41.1	3	2														2.5
18MAT41.1	3	2														2.5
18MAT41.1	3	3														3
18MAT41.1	3	3														3
PO TARGET	**3**	**2.5**														

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore - 562109

CODE:18EC51	SUBJECT: TECHNICAL INNOVATIONS & MANAGEMENT ENTREPRENEURSHIP	SEMESTER:V
CO	**CO Statement**	
18EC51.1	Understand the fundamental concepts of Management and Entrepreneurship and opportunities in order to setup a business	
18EC51.2	Identify the various organizations' architecture	
18EC51.3	Describe the functions of Managers, Entrepreneurs and their social responsibilities	
18EC51.4	Understand the components in developing a business plan	
18EC51.5	Recognize the various sources of funding and institutions supporting entrepreneurs.	

CO	PO												PSO			CO AVERAGE
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
18EC51.1	2		1					2	1	2			1			1.5
18EC51.2	2		1					2	1	2			1			1.5
18EC51.3	2		1					2	1	2	2		1			1.57
18EC51.4			1					2	1	2	2					1.6
18EC51.5			1					2	1	2	2					1.6
PO AVERAGE	**2**		**1**					**2**	**1**	**2**	**2**		**1**			

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore - 562

CODE:18EC61	SUBJECT: DIGITAL COMMUNICATION	SEMESTER:VI
CO	**CO Statement**	
18EC61.1	Associate and apply the concepts of Band-pass sampling to well specified signals and channels.	
18EC61.2	Analyze and compute performance parameters and transfer rates for low pass and band-pass symbol under ideal and corrupted non band limited channels.	
18EC61.3	Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels.	
18EC61.4	Demonstrate that band-pass signals subjected to corruption and distortion in a bandlimited channel can be processed at the receiver to meet specified performance criteria.	

CO	PO												PSO			CO AVERAGE
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
18EC61.1	3	3	1										1	1		**1.8**
18EC61.2	2	2											1	1		**1.5**
18EC61.3	1	2	2	3									1	1		**1.7**
18EC61.4		2	2										1	1		**1.5**
PO AVERAGE	**2**	**2.25**	**1.7**	**3**									**1**	**1**		

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar
Motors, Bidadi, Bangalore - 562109

CODE:18EC71	SUBJECT: COMPUTER NETWORK	SEMESTER:VII
CO	**CO Statement**	
18EC71.1	Understand the concepts of networking.	
18EC71.2	Describe the various networking architectures.	
18EC71.3	Identify the protocols and services of different layers.	
18EC71.4	Distinguish the basic network configurations and standards associated with each network.	
18EC71.5	Analyze simple network and measurement of its parameters.	

CO	PO												PSO			CO AVERAGE
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
18EC71.1	2	1								2			2			1.75
18EC71.2			3		2									2		2.33
18EC71.3	2		1		2										2	1.75
18EC71.4	1	2	2											2		1.75
18EC71.5		2	2	1											1	1.75
PO AVERAGE	**1**	**1**	**2**	**1**	**2**					**2**			**2**	**2**	**1.5**	

Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore - 562109

CODE:18EC81	SUBJECT:WIRELESS AND CELLULAR COMMUNICATION	SEMESTER:8

CO	CO Statement
18EC81.1	Understand basics of different multimedia networks and applications.
18EC81.2	Understand different compression techniques to compress audio and video.
18EC81.3	Describe multimedia Communication across Networks.
18EC81.4	Analyze different media types to represent them in digital form.
18EC81.5	Compress different types of text and images using different compression techniques.

CO	PO												PSO			CO AVERAGE
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
18EC81.1	1	2	1										1			**1.25**
18EC81.2	1	1	1										1			**1.00**
18EC81.3	1	1											1			**1.00**
18EC81.4	1	1											1	1		**1.00**
18EC81.5	1	1											1			**1.00**
PO AVERAGE	**1**	**1.20**	**1**										**1**	**1**		

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar
Motors, Bidadi, Bangalore - 562109

4. Attainment of Course Outcomes.

The key aspects in Outcome Based Education (OBE) are the assessment of course outcomes. At the initial stage of OBE implementation, the course outcomes (CO's) for each course are defined on the Programme Outcome (PO's) and other requirements. At the end of each course, the Cos needs to be assessed and evaluated, to check whether it has been attained or not. Assessment is one or more processes, carried out by the department, that identify, collect and prepare data to evaluate the achievement of Program outcomes. Attainment is the action or fact of achieving a standard result towards accomplishment of desired goals. Primarily attainment is the standard of academic attainment as observed by CIE or SEE examination result. Attainment of the Cos can be measured directly.

Direct attainment basically displays the students' knowledge and skills from their performance. It can be determined from the performance of the students in all the relevant assessment instruments- like (CIE) internal assessment, assignments, quiz, final project, technical seminar and final university examination (SEE). These methods provide a sampling of what students know and/ or can do and provide strong evidence of student learning. Each of Cos evaluated are directly assessed under the following Categories.

Continuous Internal Evaluation (CIE) test
Theory:

The Continues Internal Evaluation marks in a theory paper shall be based on three tests generally concluded at the end of 6, 10 and 14 weeks of each semester. An improvement test will be conducted for the desirous students before the end of the semester to give an opportunity to such students to improve their continues Internal Evaluation marks. It is a metric to continuously assess the attainment of the course outcomes w.r.t course objectives. Out of Total CIE marks 25% weightage is awarded by evaluation of assignments, unit tests, quizzes, with support to cover the attainment of course outcomes. Average of all the three CIE and assignments shall be the final Internal Assessment Marks for the respective course. Defined CO's for the course are mapped with CIE question paper and Assignments for direct assessment based on the performance of students. The attainment level defined for the individual course is considered as the target for each course. After the internal assessment evaluation, the marks obtained by individual student in their consecutive internals are considered and tabulated. After the Tabulation, the count of CO's is taken and percentage level of target attained is calculated for student performance. After the tabulation of CO count, CO's are mapped with PO table to attain the required target.

Practical's:

The Continuous Evaluation marks for practical's is assessed on cumulative of weekly submitted journals, conducting experiment at laboratories and viva voce. Cos defined for respective practices are mapped to list of experiment conducted and final assessment is done based on the performance of the students.

Amruta Institute of Engineering & Management Sciences * BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar
Motors, Bidadi, Bangalore - 562109

Semester End Examination (SEE)

Semester end examination (theory and practical) are the metric to assess whether all the course outcomes are attained or not. Semester Examination is more focused on attainment of course outcomes and uses a descriptive exam conducted by university. Based on students' performance in SEE, attainment of all COs is assessed directly.

Technical seminar

One technical seminar will be conducted for all students in the 8th semester by a committee consisting of the Head of the Department and three other faculty members of the department whom shall be inclusive of respective seminar guides, Seminar Coordinator(s) and expertise faculty related to seminar topic. Seminar topic shall be selected from the emerging technical areas by the students under guidance of faculty.

The Seminar Coordinator(s) announces the final schedule for report submission and presentation of individual student, based on which assessment is done considering below mentioned criteria.

a) Topic selection

b) Clarity and organizing presentation

c) Understanding concepts

d) Answering queries, during the presentation

e) Technical Seminar Report submitted.

Criteria	Marks
Clarity in presentation	10 marks
Understanding concepts	10 marks
Organising the presentation	10 marks
Report in-time submission and completeness of the report	10 marks
Interaction during presentation (Answering queries)	10 marks
Total marks	50 marks

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar
Motors, Bidadi, Bangalore - 562109

Project Work - Viva voce

Project Evaluation

Project evaluation is done in two phases by respective guide, project evaluation coordinator and one more faculty of same area of expertise.

Phase-I Evaluation

The students have to give presentation on the progress of project work including fine-tuned synopsis, literature review, problem statement, methodology adopted for execution, and percentage of completion of the project work.

Phase-II Evaluation

The students have to give presentation on the progress of project work after phase 1, along with end results / demonstration / expected results or outcome of the project work. The project will be evaluated by the committee and awarded marks based on their presentation skills, team involvement, methodologies used, test cases, results analysis, conclusion drawn and final documented report.

Sl. No	Particulars	Max. Marks
1	Relevance of the subject in the present context	10
2	Literature Survey	10
3	Problem formulation	10
4	Experimental observation/ theoretical modelling	10
5	Results — Presentation & Discussion	10
6	Conclusions and scope for future work	10
7	Overall presentation of the Thesis/Oral presentation	40
	Total Marks	100

Below said attainment levels are considered in all methods of assessment.

Attainment Level 1: 40% Students scoring more than 60% marks out of the relevant maximum marks is considered to be attainment level of "1"

Attainment Level 2: 41%-59% Students scoring more than 60% marks out of the relevant maximum marks is considered to be attainment level of "2"

Attainment Level 3: 60% Students scoring more than 60% marks out of the relevant maximum marks is considered to be attainment level of "3"

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore 562

5. Attainment of Course Outcomes of all courses with respect to set attainment levels.

The final weighted attainment of CO's for all the courses are tabulated in table and compared with the set attainment level fixed as 70% of maximum attainment level. The target attainment level is fixed upon the attainment of Cos of Previous Year.

Code	Title	CO	CO	Target 65% (2.0)
18MAT31	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	CO1	**2.5**	MET
		CO2	**2.5**	MET
		CO3	**2.5**	MET
		CO4	**3**	MET
		CO5	**3**	MET
18EC32	NETWORK THEORY	CO1	**1.5**	NOTMET
		CO2	**1.5**	NOTMET
		CO3	**1.5**	NOTMET
18EC33	ELECTRONIC DVICES	CO1	**1.66**	NOTMET
		CO2	**1.66**	NOTMET
		CO3	**1.66**	NOTMET
		CO4	**2**	MET
18EC34	DIGITAL SYSTEM DESIGN	CO1	**1.9**	MET
		CO2	**1.9**	MET
		CO3	**1.9**	MET
		CO4	1.9	MET
18EC35	COMPUTER ORGANIZATION AND ARCHITECTURE	CO1	**2**	MET
		CO2	**2**	MET
		CO3	**1.75**	NOTMET
		CO4	**1.9**	MET
		CO5	**1.6**	NOTMET
18EC36	POWER ELECTRONICS & INSTRUMENTATION	CO1	**1.5**	NOTMET
		CO2	**1.9**	MET
		CO3	**1.9**	MET
		CO4	**1.5**	NOTMET
		CO5	**1.5**	NOTMET
		CO6	**1.5**	NOTMET

Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore - 562109

18ECL37	ELECTRONICS DEVICES & INSTRUMENTATION LAB	CO1	2	MET
		CO2	2	MET
		CO3	2.14	MET
18ECL38	DIGITAL SYSTEM DESIGN LAB	CO1	1.95	MET
		CO2	1.95	MET
		CO3	1.9	MET
		CO4	2.125	MET
18MAT41	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS	CO1	2.5	MET
		CO2	2.5	MET
		CO3	2.5	MET
		CO4	3	MET
		CO5	3	MET
18EC42	ANALOG CIRCUITS	CO1	1.66	NOTMET
		CO2	2	MET
		CO3	1.66	NOTMET
		CO4	1.9	MET
		CO5	2	MET
18EC43	CONTROL SYSTEMS	CO1	1.5	NOTMET
		CO2	1	NOTMET
		CO3	1.5	NOTMET
		CO4	1.5	NOTMET
		CO5	1.5	NOTMET
18EC44	ENGINEERING STATISTICS & LINEAR ALGEBRA	CO1	1.33	NOTMET
		CO2	1.25	NOTMET
		CO3	1.25	NOTMET
		CO4	1.00	NOTMET
		CO5	1.00	NOTMET
18EC 45	SIGNALS AND SYSTEMS	CO1	1.5	NOTMET
		CO2	1.25	NOTMET
		CO3	1.16	NOTMET
		CO4	1.08	NOTMET
		CO5	1.16	NOTMET
18EC46	MICROCONTROLLER	CO1	1.9	MET

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar
Motors, Bidadi, Bangalore - 562109

		CO2	**1.9**	MET
		CO3	**2.1**	MET
		CO4	**2.2**	MET
		CO5	**1.9**	MET
18ECL47	MICROCONTROLLER LAB	CO1	**2.2**	MET
		CO2	**2.1**	MET
		CO3	**2.3**	MET
18ECL48	ANALOG CIRCUITS LAB	CO1	**2**	MET
		CO2	**2**	MET
		CO3	**2.14**	MET
18EC51	TECHNICAL INNOVATIONS & MANAGEMENT ENTREPRENEURSHIP	CO1	**2.1**	MET
		CO2	**2.1**	MET
		CO3	**2.1**	MET
		CO4	**2.1**	MET
		CO5	**2.1**	MET
18EC52	DIGITAL SIGNAL PROCESSING	CO1	**1.16**	NOTMET
		CO2	**1.16**	NOTMET
		CO3	**1.25**	NOTMET
		CO4	**1.5**	NOTMET
		CO5	**0.75**	NOTMET
18EC53	PRINCIPLES OF COMMUNICATION SYSTEM	CO1	**1.33**	NOTMET
		CO2	**1.00**	NOTMET
		CO3	**1.00**	NOTMET
		CO4	**1.00**	NOTMET
		CO5	**1.25**	NOTMET
18EC54	INFORMATION THEORY AND CODING	CO1	**2**	MET
		CO2	**2**	MET
		CO3	**1.8**	NOTMET
		CO4	**1.6**	NOTMET
18EC55	ELECTROMAGNETIC WAVE	CO1	**1.5**	NOTMET
		CO2	**1.8**	NOTMET
		CO3	**1.25**	NOTMET
		CO4	**1.8**	NOTMET

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, [illegible] Kirloskar
Motors, Bidadi [illegible] 109

		CO5	**1.6**	NOTMET
18EC56	HDL	CO1	**1.99**	MET
		CO2	**1.99**	MET
		CO3	**1.99**	MET
		CO4	**2.1**	MET
		CO5	**2.2**	MET
18ECL57	DIGITAL SIGNAL PROCESSING LAB	CO1	**1.33**	NOTMET
		CO2	**1.33**	NOTMET
		CO3	**1.41**	NOTMET
		CO4	**1.41**	NOTMET
18ECL58	HDL LAB	CO1	**2.2**	MET
		CO2	**2.2**	MET
		CO3	**2.2**	MET
		CO4	**2.2**	MET
18EC61	DIGITAL COMMUNICATION	CO1	**1.8**	NOTMET
		CO2	**1.5**	NOTMET
		CO3	**1.7**	NOTMET
		CO4	**1.5**	NOTMET
18EC62	EMBEDDED SYSTEMS	CO1	**1.25**	NOTMET
		CO2	**2.2**	MET
		CO3	**2.2**	MET
		CO4	**2.2**	MET
		CO5	**2.2**	MET
18EC63	MICROWAVE AND ANTENNA	CO1	**2.2**	MET
		CO2	**2.2**	MET
		CO3	**2.2**	MET
		CO4	**2.2**	MET
		CO5	**1.14**	MET
18E646	PYTHON APPLICATION AND PROGRAMMING	CO1	**1.6**	NOTMET
		CO2	**1.6**	NOTMET
		CO3	**1.75**	MET
		CO4	**1.8**	NOTMET
		CO5	**1.6**	NOTMET
18CS653	PROGRAMMING IN JAVA	CO1	**1.625**	NOTMET
		CO2	**1.6**	MET

Amruta Institute of Engineering & Management Sciences * BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore 562109

		CO3	**1.6**	MET
18ECL66	EMBEDDED SYSTEMS LAB	CO1	**1.7**	MET
		CO2	**1.57**	NOTMET
		CO3	**1.5**	NOTMET
		CO4	**1.5**	MET
		CO5	**1**	NOTMET
18ECL67	COMMUNICATION LAB	CO1	**1.85**	NOTMET
		CO2	**1.85**	NOTMET
		CO3	**1.85**	NOTMET
		CO4	**2**	NOTMET
18ECMP68	MINI PROJECT	CO1	**2**	MET
		CO2	**2.28**	MET
		CO3	**2.15**	MET
		CO4	**1.88**	NOTMET
18EC71	COMPUTER NETWORK	CO1	**1.75**	NOTMET
		CO2	**2.33**	MET
		CO3	**1.75**	NOTMET
		CO4	**1.75**	NOTMET
		CO5	**1.75**	NOTMET
18EC72	VLSI DESIGN	CO1	**2.15**	MET
		CO2	**2.15**	MET
		CO3	**1.98**	MET
		CO4	**1.98**	MET
		CO5	**1**	NOTMET
18EC731	REAL TIME SYSTEMS	CO1	**1.33**	NOTMET
		CO2	**1.25**	NOTMET
		CO3	**1.2**	NOTMET
		CO4	**1.22**	NOTMET
		CO5	**1.14**	NOTMET
18EC743	MULTIMEDIA COMMUNICATION SYSTEM	CO1	**1.66**	NOTMET
		CO2	**2.166**	MET

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi - 562109

		CO3	**2.166**	MET
		CO4	**2.166**	MET
		CO5	**2.166**	MET
18ME 751	ENERGY AND ENVIRONMENT	CO1	**1.33**	NOTMET
		CO2	**1.33**	NOTMET
		CO3	**1.33**	NOTMET
		CO4	**1.33**	NOTMET
		CO5	**1.33**	NOTMET
18CV753	ENVIRONMENT PROTECTION MANAGEMENT	CO1	**2.33**	MET
		CO2	**2.33**	MET
		CO3	**2.166**	MET
18ECL76	COMPUTER NETWORK LAB	CO1	**1.8**	NOTMET
		CO2	**2.4**	MET
		CO3	**1.75**	NOTMET
		CO4	**2.3**	MET
		CO5	**1.5**	NOTMET
18ECL77	VLSI LAB	CO1	**2**	MET
		CO2	**2**	MET
		CO3	**2**	MET
		CO4	**2**	MET
		CO5	**2**	MET
18EC81	WIRELESS AND CELLULAR COMMUNICATION	CO1	**1.98**	MET
		CO2	**1.98**	MET
		CO3	**1.98**	MET
		CO4	**1.98**	MET
		CO5	**1.98**	MET
18EC821	NETWORK SECURITY	CO1	**1.98**	MET
		CO2	**1**	NOTMET
		CO3	**2.1**	MET
		CO4	**1.98**	MET
		CO5	**1.93**	MET
18ECP83	PROJECT	CO1	**2**	MET

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Ba... 562109

		CO2	**2.28**	MET
		CO3	**2.15**	MET
		CO4	**2.281.88**	MET
18ECS84	TECHNICAL SEMINAR	CO1	**2.28**	MET
		CO2	**2.28**	MET
		CO3	**1.66**	MET
		CO4	**2.28**	MET
18ECI85	INTERNSHIP	CO1	**1.6**	MET
		CO2	**2**	MET
		CO3	**2**	MET

Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar
Motors, Bidadi, Bangalore - 562109

6. Attainment of Program Outcomes and Program Specific Outcomes.

6.1 Assessment tools and process

Evaluation of attainment of PO's and PSO's is based on based Direct and Indirect Assessment tools.

Direct Assessment tool is based on students' performance in internal assessments technical seminar, project work and university exams.

Performance of the students in internal assessments and SEE will lead to the attainment of Course Outcomes'. Course Outcomes of a particular Course is mapped to the relevant POs in the scale of 3, 2, and 1. Attainment for particular PO is calculated by taking weighted average of all course outcome attainment addressing that particular PO. Similar calculation is done for all the POs and for every Course. The PO attainment for a batch of students is calculated by taking the sum of all attainments for a particular PO and dividing by the n tuber of courses mapped to the same PO.

Indirect Assessment: Is based on course satisfaction survey table 6.1.a and program satisfaction (exit) survey table 6.1.b –PO and table 6.1.c –PSO of the particular outgoing batch students

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Indu... ...ota Kirloskar...

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE END SURVEY FORM- 2021-22

(to be conducted at the end of the semester, after completing the entire syllabus of the course)

Dear Student,

Give your honest, and unbiased feedback on the course learning by you. Your identity shall remain undisclosed

Give your grading from scale of 1 to 05. Minimum – 01, Maximum – 05

Sem: III	**Name of the course:** COMPUTER ORGANIZATION AND ARCHITECTURE	**Course code: 18EC35**

CO	CO assessment statement	Strongly agree(5)	Agree(4)	Moderately Agree(3)	Neither agree nor disagree (2)	Disagree(1)
18EC35.1	Are you able to explain the basic sub system of a computer, their organization, structure and operation?					
18EC35.2	Can you illustrate the concept of program as sequences of machine instruction?					
18EC35.3	Can you demonstrate different ways of communication with I/O devices?					
18EC35.4	Can you describe memory hierarchy and concept of virtual memory?					
18EC35.5	Can you illustrate the organization of simple pipelined processor and other computer systems?					

Amruta Institute of Engineering & Management Sciences
BIDADI

PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar
Motors, Bidadi, Bangalore - 562109

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
PROGRAM OUTCOME SURVEY FORM- 2021-22
(to be conducted at the end of the program)

Dear Student,

Give your honest, and unbiased feedback on attainment of program outcome based on your academic and professional achievement in order to continually improve our program in electronics and communication engineering. the rows describe the program outcomes of our under graduate program.

	In your opinion ,how important is the program outcome to you as Electronics engineer	Attainment of outcomes		
		Substantial 3	Moderate 2	Poor 1
1	**PO1: Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an Engineering specialization to the solution of complex engineering problems.			
2	**PO2: Problem Analysis**: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering			
3	**PO3: 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	**PO4: 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	**PO5: 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	**PO6: 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	**PO7: 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	**PO8: Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.			
9	**PO9: Individual and Team Work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.			
10	**PO10: 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	**PO11: 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	**PO12: Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in dependent and life-long learning in the broadest context of technological change			

Table No:6.1. b Program outcome survey format

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore - 562109

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
PROGRAM SPECIFIC OUTCOME FORM- 2021-22
(to be conducted at the end of the program)

Dear Student,

Give your honest, and unbiased feedback on attainment of program Specific outcome based on your academic and professional achievement in order to continually improve our program in electronics and communication engineering. the rows describe the program outcomes of our under graduate program.

In your opinion ,how important is the program outcome to you as Electronics engineer		Attainment of outcomes		
		Substantial 3	Moderate 2	Poor 1
1	**PSO1:** Solve the Engineering problems of Electronics & Communication Engineering in VLSI design, Embedded Systems, Communication Engineering.			
2	**PSO2:** Demonstrate programming skills using assembly and high-level languages to solve Electronics and Communication Engineering problems.			
3	**PSO3:** Demonstrate proficiency in use of software and hardware required in real life applications.			

Table No:6.1.c **Program Specific Outcome Form**

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore

Table No: 6.1.d Weightages for direct and indirect assessment

Assessment Tool		Weightage	Frequency	Responsibility
Direct Assessment	Course outcome attainment	80%	End of the semester	Department level
Indirect Assessment	Program satisfaction survey (exit survey)	20%	At the end of the program	Department level

Code .	Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
18MAT31	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	3	2.5													
18EC32	NETWORK THEORY	2	2	1										1		
18EC33	ELECTRONIC DVICES	2	2	1										1		
18EC34	DIGITAL SYSTEM DESIGN	2	2	1										1		
18EC35	COMPUTER ORGANIZATION AND ARCHITECTURE	2	1.6	1.5	2									2	1.5	1.6
18EC36	POWER ELECTRONICS & INSTRUMENTATION	2	2	1										1		
18ECL37	ELECTRONICS DEVICES & INSTRUMENTATION LAB	1	2	3		3								2	2	2
18ECL38	DIGITAL SYSTEM DESIGN LAB	1	2	3	2	3								1	2	3
18MAT41	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS	3	2.5													
18EC42	Analog Circuits	2.0	2.0	2.8	2.0	1.5								1.0		
18EC43	CONTROL SYSTEMS	2	1.6	1										1.2		
18EC44	ENGINEERING STATISTICS & LINEAR ALGEBRA	1	1.66	1.5										1	1	
18EC 45	SIGNALS AND SYSTEMS	2.6	2.4	2	1					1.6	1.8	1.6	1.8			2.6
18EC46	MICROCONTROLLER	2	2	1										1	2	
18ECL47	MICROCONTROLLER LAB	2	2	1										1	2	
18ECL48	Analog circuits Lab	1	2	3		3								2	2	2
18EC51	TECHNICAL INNOVATIONS & MANAGEMENT ENTREPRENEURSHIP	2		1					2	1	2	2		1		

Amruta Institute of Management Sciences BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore - 562109

18EC52	DIGITAL SIGNAL PROCESSING	2.6	2.4	2.2	1.8							2	3		3	1.6
18EC53	PRINCIPLES OF COMMUNICATION SYSTEM	1	1.2	1.5										1	1	
18EC54	INFORMATION THEORY AND CODING	2	2	2.3	1.3									2	1	2
18EC55	ELECTROMAGNETIC WAVE	2	1.6	1.5	2										1.8	1.3
18EC56	HDL	1.2	2.0	2.75	2.0	2.0								1.0	2	3
18ECL57	DIGITAL SIGNAL PROCESSING LAB				3	3				2	3	2.5	3		2.75	2.75
18ECL58	HDL LAB	1	2			3				2					3	
18EC61	DIGITAL COMMUNICATION	2	2.25	1.7	3									1	1	
18EC62	EMBEDDED SYSTEMS	1.2	1.8	1.6	1	1		1	1	1	1	1	1	1.6	1.5	1
18EC63	MICROWAVE AND ANTENNA	1	1.6	1.5	1									1	1	
18E646	PYTHON APPLICATION AND PROGRAMMING	1	1	2							1	3			1.75	1.3
18CS653	PROGRAMMING IN JAVA	1	2	3	1.33	3	1					1	1		2	1
18ECL66	EMBEDDED SYSTEMS LAB	1.4	1.6	1.8	1	1								1.75	1.27	1.5
18ECL67	COMMUNICATION LAB	1	1	2	3	3				2	2			2	3	1
18ECMP68	MINI PROJECT	3	2.5	2.5	1.5	2	1	1.5	3	2.5	3	1.3	2.7	3	1	
18EC71	COMPUTER NETWORK	1	1	2	1	2					2			2	2	1.5
18EC72	VLSI DESIGN	1.4	1.25	1.4	1.6	1.6								1	1	
18EC731	REAL TIME SYSTEMS	1	1.6	1.75	1	1				1	1		1	1	1	1
18EC743	MULTIMEDIA COMMUNICATION SYSTEM	1.40	1.60	1.33						1			1	1	1	
18ME 751	ENERGY AND ENVIRONMENT	2	1										1	1		
18CV753	ENVIRONMENT PROTECTION MANAGEMENT	3	3			1.66	2				2		2		2	
18ECL76	COMPUTER NETWORK LAB	1.75	1.6	2	1	2.5					2		3	2	2	2
	VLSI LAB	1	1	2	2	3				2	3	2		1	3	3
18EC81	WIRELESS AND CELLULAR COMMUNICATION	1	1.20	1										1	1	

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar
Motors, Bidadi - 562109

18EC821	NETWORK SECURITY	1.6	2.4	1.75	3						1		1	1	1
18ECP83	PROJECT	3	2.5	2.5	1.5	2	1	1.5	3	2.5	3	1.3	2.7	3	1	
18ECS84	TECHNICAL SEMINAR				2	1	3	1			1.7		2	2	1	2
18ECI85	*Internship*					2.0	2.0	1.7					2.0	1.7		
Average Direct Attainment		2.06	1.95	2.27	1.78	1.90	1.87	1.82	1.92	2.04	1.89	2.48	1.76	1.99	2.01	1.97
Plan PO		1.99	1.92	2.32	1.78	1.82	1.82	1.76	1.91	1.96	1.82	2.49	1.61			
Average Indirect Attainment		2.32	2.09	2.09	1.8	2.22	2.09	2.06	1.96	2.38	2.19	2.41	2.35	2.38	2.25	2.161

Amruta Institute of Engineering & Management Sciences
BIDADI

ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF
ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar
Motors, Bidadi, Bangalore

BVV Sangha, Bagalkot

AMRUTA INSTITUTE OF ENGINEERING & MANAGEMENT SCIENCES

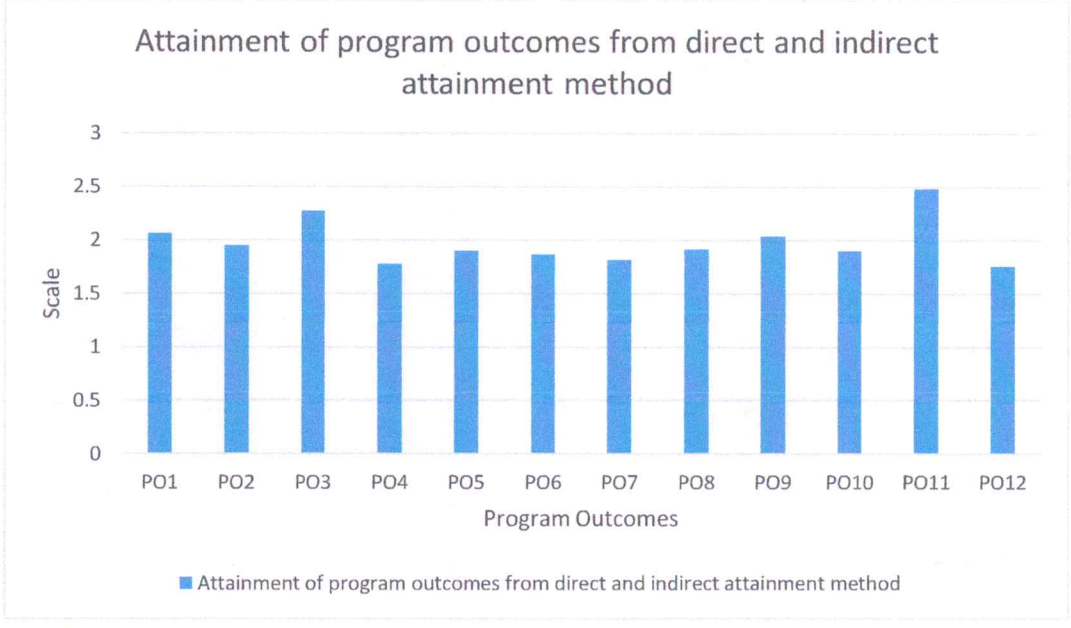
Approved by AICTE, New Delhi

Recognized by Government of Karnataka & Affiliated to VTU, Belagavi

AIEMS BENGALURU

Department: Electronics & Communication Engineering Program: BE E & C Year of Graduation:2021-22

Program Outcome & Program Specific Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
Average Attainment of PO and PSO BY Direct Assessment.	1.99	1.92	2.32	1.78	1.82	1.82	1.76	1.91	1.96	1.82	2.49	1.61	1.99	2.00	1.99
Average Attainment of PO and PSO BY Indirect Assessment.	2.32	2.09	2.09	1.8	2.22	2.09	2.06	1.96	2.38	2.19	2.41	2.35	2.39	2.23	2.16
Overall Attainment of PO & PSO.	2.06	1.95	2.27	1.78	1.90	1.87	1.82	1.92	2.04	1.89	2.48	1.76	2.07	2.05	2.03
Target	1.77	1.75	1.86	1.58	1.60	1.63	1.67	1.60	1.60	1.66	1.91	1.46	1.69	1.69	1.72



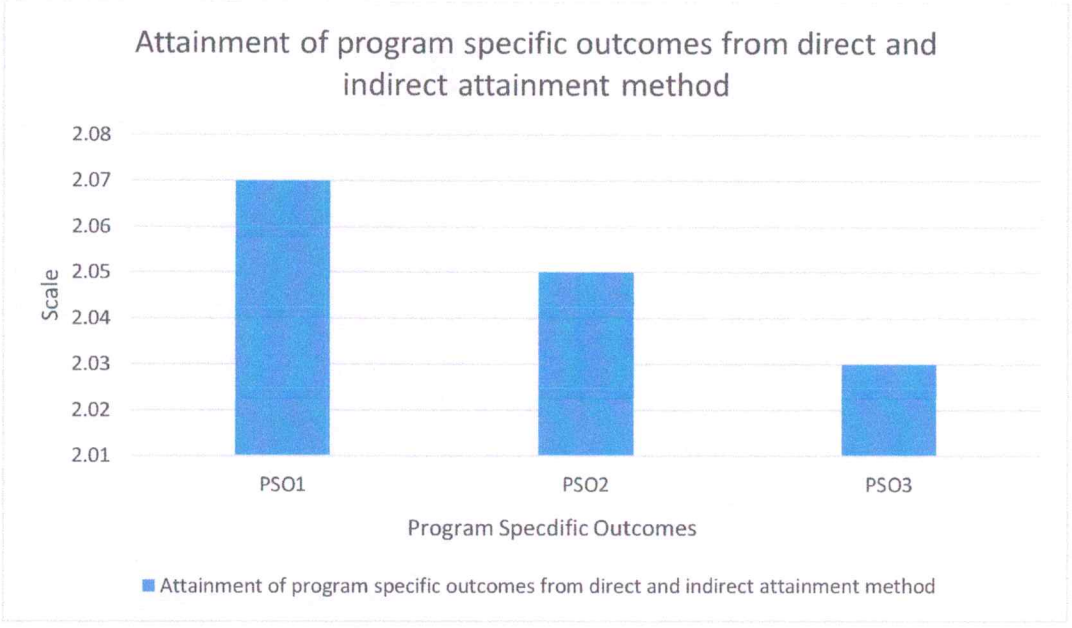
Institute of Engineering & Management Sciences * BIDADI

ATTESTED

PRINCIPAL

BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE

Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore - 562109



ATTESTED
PRINCIPAL
BVVS AMRUTA INSTITUTE OF ENGINEERING AND MANAGEMENT SCIENCE
Bidadi Industrial Area, Near Toyota Kirloskar Motors, Bidadi, Bangalore - 562109

Amruta Institute of Engineering & Management Sciences
BIDADI