AMITY UNIVERSITY
UTTAR PRADESH

Outcome Assessment Plan

Domain: Engineering & Technology

Institution: Amity School of Engineering & Technology

Date: **1st July 2019**

SECTION I

INTRODUCTION TO DOMAIN

The Science and engineering education system in India has witnessed rapid progress in recent years to become one of largest in the world. Considering the wide diversities in the system and the need to enhance its *quality, standard and relevance* so that the *Science, Engineering & Technology* graduates passing out from the system can meet the global challenges of 21st century ahead of them.

There are a number of challenges being faced by science and engineering professionals in the on-going 21st century, recognized as the *Knowledge Age*, like:

1) Rapidly changing technological scene worldwide, with a shrinking time scale for new developments and for obsolescence of old practices, leading to:

- Increase in investment on R&D in industry and other sectors;
- Demand for innovative products and services, based on contemporary technologies; and,
- Growing need for enhancement of abilities to manage change, so frequent, now a days;

2) Globalization and liberalization of Indian industry, leading to:

- Comprehensive restructuring of industry sector for enhancing efficiency;
- Increase in world-wide mobility of *Science, Engineering & Technology* professionals; and,
- Growth of competitive environment globally and also in the country;

3) Emergence of new career opportunities for Science, Engineering & Technology professionals, leading to:

- Demand for broad-based, flexible education in multi/inter- disciplinary subjects;
- Emphasis on PG courses, research training and institute-industry interaction; and,
- Advances in learner-centric programmes and life-long learning opportunities;

4) Penetration of IT in all sectors of the Science, Engineering & Technology profession, leading to:

- Increased demand for IT-based solutions to industrial and societal problems;
- Expertise in emerging IT developments to solve complex, *Science, Engineering & Technology* problems; and,
- Improved access to worldwide information/data bases and *knowledge* centers.

5) Increased social/environmental concerns in the Science, Engineering & Technology context, leading to:

- Effective means for protection of endangered environment and depleting energy sources;
- Seeking environment- and energy- friendly solutions to *Science, Engineering & Technology* problems; and.
- Wealth generation using environmentally benign and energy efficient techniques;

These challenges require appropriate orientation of *Science, Engineering & Technology* education and research in the country at all levels, particularly at PG. Further the industrial needs are changing while the global environment of Science & Engineering education around the world is witnessing huge changes in education. In the era of globalization, national boundaries are vanishing. The Science & Engineering institutions need to benchmark their curriculum with the best institutions in the world and seek accreditation from National and International accreditations for recognition and mobility of students. Consequently, the All India Council of Technical Education (AICTE), University Grants Commission (UGC), NAAC, NBA and Knowledge Commission have been continuously rethinking on the modifications / improvements in the curriculum

structure of various programmes of higher education at large. UGC has formulated Choice Based Credit System (CBCS) for higher education in 2009, which has been adopted by many of the Universities /institution in the country.

Amity University is continuously striving for excellence in education. It is therefore, important to review and upgrade the curriculum of Bachelors Programmes in Science Engineering & Technology in line with the norms of UGC, National and International Accreditation bodies such as NAAC, ABET, IET, WASC, Global Benchmarking, industry and other stakeholders' feedbacks. After a series of discussions and deliberations with concerned groups, model framework/Programme structure and implementation guidelines for Bachelor's programme in Science, Engineering and Technology domain have been evolved in line with the requirements of UGC / AICTE, National & international Accreditation bodies and industry requirements. *Model Framework /Programme Structure and Scheme of Instructions* would be of help to the institutions offering Bachelor's programme in Science, Engineering & Technology domain *to* finalize the FETailed programme structure, syllabus and CBCS of various programmes of study.

Approach to Curriculum:

As a major objective of Bachelor's programme in Science, Engineering and Technology domain is to lay special emphasis on educating/preparing the students well for being able to demonstrate the following abilities:

(a) Effective application of *knowledge* of mathematics, science and technical subjects;
(b) Planning and design to conduct scientific and technical experiments;
(c) Analysis and interpretation of scientific, technical and economic data collected;
(d) Design of parts, subsystems, systems and/or processes to meet specific needs;
(e) Identification, formulation and solving of problems using simulation or otherwise;

(f) Use of techniques/tools including software in all disciplines, as may be required;

(g) Effective communication skills and leadership/participation in team work;

(h) Fulfillment of professional, social and ethical responsibilities;

(i) Sensitivity to environmental and energy issues and concerns;

(j) Planning, development and implementation of strategies for life-long learning.

These requirements call for the following objectives to the *Approach to Curriculum* relating to *Bachelor's programme in Science, Engineering and Technology Degree* in the country:

1) *Preparation:* To prepare the students to excel in various educational programmes or to succeed in industry / technical profession through further education/training;

2) *Core Competence:* To provide the students with a solid foundation in mathematical, Science , Engineering & Technology fundamentals required to solve Science, Engineering and Technology related problems;

3) *Breadth:* To train the students with a breadth of Science, Engineering and Technology knowledge to comprehend, analyze, design & create novel products and solutions for real life problems;

4) *Professionalism:* To inculcate in the students professional/ethical attitude, effective team work skills, multidisciplinary approach and to relate Science, Engineering and Technology issues to a broader context;

5) *Learning Environment:* To provide the students with academic environment of excellence, leadership, ethical guidelines and life-long learning needed for a long/productive career.

Amity University is continuously striving for excellence in education. It is therefore, important to review and upgrade the curriculum of Programmes in line with the ever changing requirements of industry /profession based on stakeholders' feedbacks. Amity University Offers Outcome Based Education (OBE) with Flexi Choice Based Credit System (CBCS) by benchmarking its programmes with best universities globally. UGC has formulated Choice Based Credit System (CBCS) for higher education in 2009, which have been further modified in 2014 to be adopted by the Universities /institution in the country.

SECTION II

INTRODUCTION OF OUTCOME ASSESSMENT PLAN

Outcomes Assessment

Outcomes assessment is a systematic, evaluative process that is implemented to secure learning experiences that are congruent with original goals and objectives; thereby providing a basis for the effectiveness and continuous quality improvement of the academic unit.

1) The annual **outcome assessment** process is more **qualitative** and focuses on improving teaching by **analyzing student learning outcomes**.
2) The programme **review process** is more **quantitative** and focuses on the programme/discipline as a whole, how effective it is, and that our students are learning.
3) To achieve the above, some aspect of each programmes goals and objectives needs to be assessed on an annual basis.
4) All programme and general education goals shall be evaluated annually

The outcome assessment plan includes:

1. **Mission** - The Mission is defined for the domain which flows down to the Institution level and finally to the programme level. The mission at the institution and programme level is aligned with the domain mission
2. **Broad Based Goals:** - The broad based are defined under the following categories:

2.1 Educational Goals: The Educational Goals are defined at Domain, Institution and Programme level. The Educational Goals at the institution and programme level are aligned with the domain mission.

2.2 Operational Goals: The Operational Goals are defined at Domain, Institution and Programme level. The Operational Goals at the institution and programme level are aligned with the domain mission.

3. **Outcomes:** The Outcomes are defined under the following categories:

3.1 Operational Outcomes: The operational outcomes are defined for the domain and assessed at the domain level

3.2 Educational Goals - The Learning outcomes are defined for each programme and each learning outcome is assessed to identify that the established learning objectives are achieved.

4. **Mapping of PEOs and PLOs –** The relationship of PEOs and PLOs are clearly indicated through the mapping of learning outcomes with the established Objective. Each outcome addresses some objective and achievement of outcome indicates the attainment of Objective
5. **Assessment of Learning and Operational Outcomes** – Each learning outcome is assessed by at least one direct and one indirect method. Similarly Operational outcomes are also assessed using the operational assessment tools. It also ensures that outcomes achieved are consistent with the mission. The results of the annual assessments and other data are used to FETermine the effectiveness of the programme during the programme review process.

6. Programme Review: **Through the review of our programmes we seek to demonstrate that**:

- Students are **learning** the knowledge, skills, and habits necessary to achieve the programme/discipline goals and objectives

- The **programme/discipline goals** are derived from and support the college mission
- The **curriculum** is coherent, current and consistent
- The **instruction** is effective in enabling student
- The **resources** are adequate for the production of student learning.
- The academic **support services** are adequate to facilitate student learning.

SECTION III

DOMAIN MISSION AND BROAD-BASED GOALS /OBJECTIVES

Faculty of Engineering & Technology (FET)

Section I: Mission and Broad-Based Goals

3.1 Mission Statement

Mission Statement:
"To provide education at all levels in all disciplines of Engineering and Technology and in the futuristic and emerging frontier areas of knowledge, learning and research and to develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals, with understanding and regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

3.2. Broad-Based Educational Goals

Broad-Based Student Educational Goals:	
1.	Students shall be able to illustrate knowledge of theory and concepts of Engineering & Technology in a professional work setting
2.	Students shall be able to interpret, examine, formulate, design and create novel products and solutions for real life problems
3.	Students shall be able to relate Engineering issues to the broader social, legal, cultural and environmental contexts
4.	Students shall be able to demonstrate effective performance by leveraging Information and Technological competencies in the professional/entrepreneurial careers
5.	Students shall be able todemonstrate professional attitudes, effective communication and behavioral skills that support and improve individual's performance
6.	Students shall be able tocreate technical competence for successful and productive careers or advance studies/research in the field of Engineering & Technology
7.	Students shall be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and in managing projects.
8.	Students will be able to critically examine and utilize learning throughout their career

3.3 Broad-Based Operational Goals

S.No	Operational Goals
1	FET will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	FET will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	FET will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	FET will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	FET will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	FET will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	FET will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	FET will create opportunities for international exposure for its students and faculty.

Amity School of Engineering & Technology (ASET)

SECTION IV

INSTITUTION MISSION AND BROAD-BASED GOALS /OBJECTIVES

Name of the Institution: **AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY**

4.1 Mission Statement

Mission of Institution
"To provide education at all levels in various disciplines of Engineering and Technology and in the futuristic and emerging frontier areas of knowledge, learning and research and to develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals, with understanding and regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action".

4.2 Broad-Based Goals / Objectives at Institution Level

Broad-Based Student Learning Goals at Institutional Level:	
1.	Students shall be able to illustrate knowledge of theory and concepts of Engineering & Technology in a professional work setting
2.	Students shall be able to interpret, examine, formulate, design and create novel products and solutions for real life problems
3.	Students shall be able to relate Engineering issues to the broader social, legal, cultural and environmental contexts
4.	Students shall be able to demonstrate effective performance by leveraging Information and Technological competencies in the professional/entrepreneurial careers
5.	Students shall be able to demonstrate professional attitudes, effective communication and behavioral skills that support and improve individual's performance
6.	Students shall be able to create technical competence for successful and productive careers or advance studies/research in the field of Engineering & Technology
7.	Students shall be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and in managing projects.
8.	Students will be able to critically examine and utilize learning throughout their career

4.3 Broad-Based Operational Goals (Resources Required) At Institution level

S.No	Operational Goals
1	ASET will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	ASET will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	ASET will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	ASET will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	ASET will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	ASET will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	ASET will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	ASET will create opportunities for international exposure for its students and faculty.

Section V

Programme Mission, PEO's, PLO's and Assessment Plan for each Programme

5. 1 Bachelor's-Level Programme –

B.Tech.(Computer Science & Engineering),

B.Tech (Computer Science & Engineering – Evening)

5.1.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Computer Science & Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.1.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per industry and societal requirements. 2. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. 5. The student will have the ability to support and practice independent and life-long learning for professional development.

5.1.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.1.4 Programme Learning Outcomes

Programme Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of computer science & engineering. 2. The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions. 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practices as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, economic, global, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5.1.5 Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.1.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs). The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcome (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
BACHELOR'S LEVEL PROGRAMS					
B.TECH					
Learning Outcome 1	√				
Learning Outcome 2	√				
Learning Outcome 3	√				
Learning Outcome 4	√				
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			
Learning Outcome 8			√		
Learning Outcome 9				√	
Learning Outcome 10				√	

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcome (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 11				√	
Learning Outcome 12					√

5.1.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of computer science & engineering	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		conclusions using first principles of mathematics, natural sciences, and engineering sciences						grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practices as	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		per the Industrial trends with an understanding of the limitations.						
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal

								and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% of the students shall qualify the exam	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% of the students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		undertake a common goal in multidisciplinary settings				Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% of the students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students	Industry Internship	UG/PLO/ID/II	Atleast 40% of the

		of technological change			shall obtain a grade ‘A’ or above			students shall obtain a grade ‘A’ or above
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

M.Tech (Computer Science & Engineering)

5.2.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Computer Science & Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.2.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements. 2. The students shall have the ability to apply research knowledge and methods to solve engineering problems 3. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 4. Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur 5. The student will have the ability to support and practice independent and life-long learning for professional development. 6. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.2.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme of B.Tech CSE will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.2.4 Programme Learning Outcomes

Programme Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of computer science & engineering. 2. The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practice as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, economic, global, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues

5.2.5 Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.2.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs). The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
Name of the programme						
Learning Outcome 1	√	√				
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				
Learning Outcome 5	√	√				
Learning Outcome 6			√			
Learning Outcome 7			√			

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 8				√		
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	
Learning Outcome 12						√

5.2.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of computer science & engineering	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked "Satisfactory"	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked "Satisfactory"	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		conclusions using first principles of mathematics, natural sciences, and engineering sciences						grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked “Satisfactory”	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked "Satisfactory"			
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practice as per the Industrial trends with an understanding	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked "Satisfactory"	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		of the limitations						
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked 'satisfactory' 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal

								and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked 'Satisfactory' 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked 'Satisfactory' 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% of the students shall qualify the exams	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% of the students shall pass the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		undertake a common goal in multidisciplinary settings				Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked “Satisfactory”			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% of the students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked “Satisfactory”	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked “Satisfactory”	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students	Industry Internship	UG/PLO/ID/II	Atleast 40% of the

		of technological change			shall be marked “Satisfactory”			students shall obtain a grade ‘A’ or above

5.3. B.Tech.(Information Technology)

5.3.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Information Technology as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.3.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per industry and societal requirements. 2. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. 5. The student will have the ability to support and practice independent and life-long learning for professional development.

5.3.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.3.4 Programme Learning Outcomes

Programme Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Computer Science & Information Technology
2. The student will identify, formulate research literature and analyse Computer Science & Information Technology problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. The student will create solutions for computing problems and design and administer system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations.
4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions
5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practice as per the Industrial trends with an understanding of the limitations.
6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice.
7. The student will recognize the impact of the professional engineering solutions in political, global, economic, societal and environmental contexts to demonstrate the knowledge and the need for the sustainable development.
8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice.
9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings.
10. The student will use effective communication to cater to both technical and non-technical audiences.
11. The student will 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 as well as to manage projects effectively in multidisciplinary environments.
12. The student will recognise the need to engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5.3.5 **Programme Operational Outcomes**

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.

Operational Outcomes	
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.3.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)
The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Intended Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
BACHELOR'S LEVEL PROGRAMS					
Name of the programme: B.Tech (Information Technology)					
Learning Outcome 1	√				

Broad-Based Student Learning Goals (PEOs) / Intended Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 2	√				
Learning Outcome 3	√				
Learning Outcome 4	√				
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			
Learning Outcome 8			√		
Learning Outcome 9				√	
Learning Outcome 10				√	
Learning Outcome 11				√	
Learning Outcome 12					√

5.3.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Computer Science & Information Technology	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyse Computer Science & Information Technology problems reaching	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences						grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions for computing problems and design and administer system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above			
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practice as per the Industrial trends with an understanding	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		of the limitations.						
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal

								and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in political, global, economic, societal and environmental contexts to demonstrate the knowledge and the need for the sustainable development.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice.	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% students shall qualify the exam	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		undertake a common goal in multidisciplinary settings				Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences.	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	The student will 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 as well as to manage projects effectively in multidisciplinary environments.	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
12	Lifelong Learning	The student will recognise the need to engage in independent and life-long learning in the broadest context of technological change and	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students	Industry Internship	UG/PLO/ID/II	Atleast 40% of the

		contemporary issues.			shall obtain a grade ‘A’ or above			students shall obtain a grade ‘A’ or above
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

5. 4 Master's-Level Programme - M.Tech.(Computer Network & Information Security)

5.4.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Computer Network & Information Security as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.4.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements. 2. The students shall have the ability to apply research knowledge and methods to solve engineering problems 3. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 4. Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur 5. The student will have the ability to support and practice independent and life-long learning for professional development. 6. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.4.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.4.4 Programme Learning Outcomes

Intended Learning Outcomes
1. Student will effectively apply knowledge of mathematics, applied sciences and engineering to solve complex problems. 2. Student will identify, analyze research literature and formulate **Computer Network & Information Security** problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. Student will create solutions for complex **Computer Network & Information Security** problems and design system components or processes that meet the specifications with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. 4. Student will carry out investigations of complex problems using 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. Student will create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to different computer science & engineering activities as per the Industrial trends with an understanding of the limitations 6. Student will 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. Student will recognize the impact of the professional **Computer Network & Information Security** solutions in societal and environmental contexts and demonstrate the knowledge of and need for the sustainable development. 8. Student will apply ethical principles and demonstrate professional ethics, responsibilities and norms of the engineering practice. 9. Student will demonstrate effectiveness as an individual and as a member or leader in teams and in multidisciplinary settings. 10. Student will use effective communication to cater to both technical and non-technical audiences. 11. Student will 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 as well as to manage projects in multidisciplinary environments. 12. Student will recognise the need for and will engage in independent and life-long learning in the broadest context of technological change.

5.4.5 **Programme Operational Outcomes**

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.

Operational Outcomes	
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.4.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)
The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Intended Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
Name of the programme						
Learning Outcome 1	√	√				

Broad-Based Student Learning Goals (PEOs) / Intended Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				
Learning Outcome 5	√	√				
Learning Outcome 6			√			
Learning Outcome 7			√			
Learning Outcome 8				√		
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	

Broad-Based Student Learning Goals (PEOs) Intended Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 12						√

5.4.7 Student Learning Assessment for M.Tech.(Computer Network & Information Security)

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	Student will effectively apply knowledge of mathematics, applied sciences and engineering to solve complex problems.	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, analyze research literature and formulate Computer	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		Network & Information Security problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
3	Design/Development of Solutions	The student will create solutions for complex Computer Network & Information Security problems and design system components or processes that meet the specifications with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
4	Problem Analysis	The student will carry out investigations of complex problems using research-based	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a

		knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.			‘A’ (>=75-100%)			grade‘A’ (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory			
5	Modern Tool Usage	The student will create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to different computer science & engineering activities as per the Industrial trends with an understanding of the limitations	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

6	The Engineer & Society	The student will 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.	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues
7	Environment & Sustainability	Student will recognize the impact of the professional Computer Network & Information Security solutions in societal and environmental	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		contexts and demonstrate the knowledge of and need for the sustainable development.	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues
8	Ethics	The student will apply ethical principles and demonstrate professional ethics, responsibilities and norms of the engineering practice.	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%) 100% of the students shall have plagiarism 15% or below

			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% students shall qualify the exam	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader in teams and in multidisciplinary settings.	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)			

			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences.	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			

11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments.	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
12	Lifelong Learning	The student will recognise the need for and will engage in independent and life-long learning in the broadest context of technological change.	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above

5. 5 Bachelor's-Level Programme - B.Tech.(Civil Engineering)

5.5.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Civil Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.5.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per industry and societal requirements. 2. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. 5. The student will have the ability to support and practice independent and life-long learning for professional development.

5.5.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.5.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Civil Engineering. 2. The student will identify, formulate research literature and analyse Civil Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions 5. The student will create, select and apply appropriate techniques, resources and modern engineering and Civil Engineering tools, necessary for engineering practice as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, global, economic, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues

5.5.5 **Programme Operational Outcomes**

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.

Operational Outcomes	
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.5.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)
The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Program Learning Goals (PEOs) / Intended Program Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
BACHELOR'S LEVEL PROGRAMS					

Broad-Based Program Learning Goals (PEOs) Intended Program Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Name of the programme: B.Tech					
Learning Outcome 1	√				
Learning Outcome 2	√				
Learning Outcome 3	√				
Learning Outcome 4	√				
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			
Learning Outcome 8			√		
Learning Outcome 9				√	

Broad-Based Program Learning Goals (PEOs) Intended Program Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 10				√	
Learning Outcome 11				√	
Learning Outcome 12					√

5.5.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	PLO1	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade 'A' (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade 'A' or above. .
2	Investigation	PLO2	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade 'A' (>= 75-100%)

			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .
3	Design/Development of Solutions	PLO3	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .

4	Problem Analysis	PLO4	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .
5	Modern Tool Usage	PLO5	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)

			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .
6	The Engineer & Society	PLO6	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .
7	Environment & Sustainbility	PLO7	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a

					grade ‘A’ or above			grade ‘A’ or above. .
8	Ethics	PLO8	Plagiarism Checking of NTCC Report		100% Students are checked for plagiarism in NTCC report submissions and are allowed to appear for vivavoce upon obtaining plagiarism % below 15%.	Feedback of Industry Internship Guide	UG/PLO/ID/ II	60% students are rated between 4-5 range on the Likert Scale in the feedback by Industry guides.
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)

9	Individual and Team Work	PLO9	Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 80% of the students shall pass the exam .	Student Exit Survey	UG/PLO/ID/ ES	70% students response range between 4-5 on the Likert Scale in the Student Exit Survey.
						Alumni Survey	UG/PLO/ID/ AS	70% students response range between 4-5 on the Likert Scale in the Alumni Survey.

			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>= 75-100%)	Student Exit Survey Industry Internship	UG/PLO/ID/ ES UG/PLO/ID/ II	Atleast 85% of the students shall give a grade 'A' (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above			40% of the students shall obtain a grade 'A' or above. .
10	Communication	PLO10	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 80% of the students shall pass the exam .	Student Exit Survey	UG/PLO/ID/ ES	70% students response range between 4-5 on the Likert Scale in the Student Exit Survey.
						Alumni Survey	UG/PLO/ID/ AS	70% students response range between 4-5 on the Likert Scale in the Alumni Survey.

			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .
11	Project Management & Finance	PLO11	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .

12	Lifelong Learning	PLO12	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)

5.6. BACHELOR'S-Level Programme –

B.Tech Electronics & Communication Engineering
B.Tech Electronics & Communication Engineering Evening

5.6.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Electronics & Communication Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.6.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per industry and societal requirements. 2. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. 5. The student will have the ability to support and practice independent and life-long learning for professional development.

5.6.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme of B.Tech ECE will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs.
8	The Programme will create opportunities for international exposure for its students and faculty.

5.6.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Electronics and Communication Engineering. 2. The student will identify, formulate research literature and analyze Electronics and Communication Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions. 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practices as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, economic, global, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5.6.5Programme Operational Outcomes

Operational Outcomes
1. The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2. The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3. The student will graduate in timely manner.
4. The student and faculty shall have academic facilities, technological resources for teaching and learning.
5. The student will earn achievements in inter-university Extra Curricular activities.
6. The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7. The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8. The faculty will facilitate cultivation of cross cultural humanitarian values.
9. The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10. The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11. The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12. The faculty will support all the students for quality placements or join family business or start their own venture.

5.6.6 Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)

The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
BACHELOR'S LEVEL PROGRAMS					
Name of the programme					
Learning Outcome 1	√				
Learning Outcome 2	√				
Learning Outcome 3	√				
Learning Outcome 4	√				

Broad-Based Student Learning Goals (PEOs) Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			
Learning Outcome 8			√		
Learning Outcome 9				√	
Learning Outcome 10				√	
Learning Outcome 11				√	
Learning Outcome 12					√

5.6.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will demonstrate the knowledge of mathematics, science, engineering fundamentals, and domain knowledge in Electronics and Communication Engineering to the solution of complex engineering problems.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will demonstrate an ability to identify, formulate, research	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		literature, and analyze complex engineering problems reaching substantiated conclusions using principles of mathematics, natural sciences, and engineering sciences with focus in Electronics and Communication Engineering.	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
3	Design/Development of Solutions	The student will demonstrate an ability to design	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration public health and safety, economical, cultural, societal, and environmental considerations.	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

4	Problem Analysis	The student will demonstrate the research-based knowledge and research methods including design and conduct of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above			
5	Modern Tool Usage	The student will create, select, and apply appropriate techniques, resources, and	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
6	The Engineer & Society	The student will be able to apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility

		engineering practice.			environment, society, ethics, health, safety, legal and cultural issues			towards environment, society, ethics, health, safety, legal and cultural issues

7	Environment & Sustainability	The student will be able to understand the impact of the professional engineering solutions in political, global, economic, societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will demonstrate ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% of the students shall qualify the exam.	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
9	Individual and Team Work	The student will be able to function effectively as an	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% of the students shall	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A'

		individual, and as a member or leader in diverse teams, and in multidisciplinary settings.			qualify the exam.			(>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
10	Communication	The student will be able to 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,	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% of the students shall qualify the exam.	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry feedback	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall			

		make effective presentations, and give and receive clear instructions.			obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	The student will be able to demonstrate knowledge and understanding of Engineering and Management Principles as an individual, and as a member or leader in diverse teams considering economical and financial factors. Also, The student will be able to participate and succeed in competitive examinations.	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry feedback	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

12	Lifelong Learning	The student will understand the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological changes and contemporary issues.	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry feedback	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above

5. 7 Master's-Level Programme-

M.Tech.(Structural Engineering)

5.7.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Structural Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.7.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements. 2. The students shall have the ability to apply research knowledge and methods to solve engineering problems 3. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 4. Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur 5. The student will have the ability to support and practice independent and life-long learning for professional development. 6. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.7.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.7.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will effectively apply knowledge of mathematics, applied sciences and engineering to solve complex problems using concepts of Structural Engineering 2. The student will identify, analyze research literature and formulate Structural Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for complex Structural Engineering problems and design system components or processes that meet the specifications with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. 4. The student will carry out investigations of complex problems using 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. The student will create, select, and apply appropriate techniques, resources, and modern engineering tools including prediction and modeling to different Structural Engineering activities as per the Industrial trends with an understanding of the limitations 6. The student will 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. The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for the sustainable development. 8. The student will apply ethical principles and demonstrate professional ethics, responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader in teams and in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for and will engage in independent and life-long learning in the broadest context of technological change.

5.7.5 Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.

Operational Outcomes	
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.7.6 PEO's – PLO mapping-Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)

The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
M.Tech Structural Engineering						
Learning Outcome 1	√	√				

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				
Learning Outcome 5	√	√				
Learning Outcome 6			√			
Learning Outcome 7			√			
Learning Outcome 8				√		
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 12						√

5.7.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	Student will effectively apply knowledge of mathematics, applied sciences and engineering to solve complex problems.	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, analyze research literature and formulate Computer Network & Information Security problems reaching substantiated conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		using first principles of mathematics, natural sciences, and engineering sciences.			marked satisfactory			
3	Design/Development of Solutions	The student will create solutions for complex Computer Network & Information Security problems and design system components or processes that meet the specifications with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
4	Problem Analysis	The student will carry out investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	

		data, and synthesis of the information to provide valid conclusions.	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory			Atleast 40% of the students shall obtain a grade 'A' or above
5	Modern Tool Usage	The student will create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to different structural engineering activities as per the Industrial trends with an understanding of the limitations	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
6	The Engineer & Society	The student will apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall

		professional engineering practice.			satisfactory or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues			obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues
7	Environment &Sustainbility	Student will recognize the impact of the professional Computer Network & Information Security solutions in societal and environmental contexts and demonstrate the knowledge of and need for the sustainable development.	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory or above 100% of the students shall pursue their responsibility towards	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment,

					environment, society, ethics, health, safety, legal and cultural issues			society, ethics, health, safety, legal and cultural issues
8	Ethics	The student will apply ethical principles and demonstrate professional ethics, responsibilities and norms of the engineering practice.	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% students shall qualify the exam	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader in teams and in multidisciplinary settings.	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory			
10	Communication	The student will use effective communication to cater to both technical and	Business Communication Rubrics	UG/PLO10/D/BC	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)

		non-technical audiences.	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)			
11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments.	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

12	Lifelong Learning	The student will recognise the need for and will engage in independent and life-long learning in the broadest context of technological change.	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above

5. 8 Master's-Level Programme-

M.Tech.(Environmental Engineering)

5.8.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Environmental Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.8.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements. 2. The students shall have the ability to apply research knowledge and methods to solve engineering problems 3. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 4. Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur 5. The student will have the ability to support and practice independent and life-long learning for professional development. 6. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.8.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.8.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will effectively apply knowledge of mathematics, applied sciences and engineering to solve complex problems using concepts of Environmental Engineering 2. The student will identify, analyze research literature and formulate Environmental Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for complex Environmental Engineering problems and design system components or processes that meet the specifications with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. 4. The student will carry out investigations of complex problems using 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. The student will create, select, and apply appropriate techniques, resources, and modern engineering tools including prediction and modeling to different civil engineering activities as per the Industrial trends with an understanding of the limitations. 6. The student will 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. The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for the sustainable development. 8. The student will apply ethical principles and demonstrate professional ethics, responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader in teams and in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for and will engage in independent and life-long learning in the broadest context of technological change.

5.8.5 **Programme Operational Outcomes**

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.

Operational Outcomes	
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.8.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)
The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Program Learning Goals (PEOs) Intended Program Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
MASTER'S LEVEL PROGRAMS					
Name of the programme: M.Tech (Environmental Engineering)					

Broad-Based Program Learning Goals (PEQs) Intended Program Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 1	√				
Learning Outcome 2	√				
Learning Outcome 3	√				
Learning Outcome 4	√				
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			
Learning Outcome 8			√		
Learning Outcome 9				√	
Learning Outcome 10				√	

Broad-Based Program Learning Goals (PEQs) Intended Program Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 11				√	
Learning Outcome 12					√

5.8.7 Student Learning Assessment for M.Tech.(Environmental Engineering)

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	PLO1	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	PLO2	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
3	Design/Development of Solutions	PLO3	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
4	Problem Analysis	PLO4	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	

			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory			Atleast 40% of the students shall obtain a grade 'A' or above
5	Modern Tool Usage	PLO5	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
6	The Engineer & Society	PLO6	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall

					satisfactory or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues			obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues
7	Environment & Sustainbility	PLO7	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory or above 100% of the students shall pursue their responsibility towards	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment,

					environment, society, ethics, health, safety, legal and cultural issues			society, ethics, health, safety, legal and cultural issues
8	Ethics	PLO8	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% students shall qualify the exam	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

9	Individual and Team Work	PLO9	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory			
10	Communication	PLO10	Business Communication Rubrics	UG/PLO10/D/BC	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)

			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marked satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	PLO11	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
12	Life long learning	PLO12	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

					marked satisfactory			

5.9 Bachelor's-Level Programme –

B.Tech.(Mechanical & Automation Engineering/ Mechanical Engineering/ Automobile Engineering),

B.Tech (Mechanical & Automation Engineering– Evening/ Mechanical Engineering- Evening)

5.9.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Mechanical Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.9.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per industry and societal requirements. 2. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. 5. The student will have the ability to support and practice independent and life-long learning for professional development

5.9.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.9.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of mechanical & automation engineering. 2. The student will identify, formulate research literature and analyze mechanical & automation engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for mechanical & automation engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for Engineering practice as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, global, economic, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change.

5.9.5 **Programme Operational Outcomes**

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.9.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs). The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcome (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
BACHELOR'S LEVEL PROGRAMS					
B.TECH					
Learning Outcome 1	√				
Learning Outcome 2	√				
Learning Outcome 3	√				
Learning Outcome 4	√				
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			
Learning Outcome 8			√		
Learning Outcome 9				√	
Learning Outcome 10				√	

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcome (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 11				√	
Learning Outcome 12					√

5.9.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of mechanical & automation engineering	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze mechanical & automation engineering problems reaching substantiated	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		conclusions using first principles of mathematics, natural sciences, and engineering sciences						grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions for mechanical & automation engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above			
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for engineering practice as per the Industrial trends with an understanding	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		of the limitations						
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal

								and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	*Atleast 85% students shall qualify the exam*	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to	Foreign Business Language Rubrics	UG/PLO9/D/FBL	*Atleast 85% students shall qualify the exam*	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		undertake a common goal in multidisciplinary settings				Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	*Atleast 85% students shall qualify the exam*	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students	Industry Internship	UG/PLO/ID/II	Atleast 40% of the

		of technological change			shall obtain a grade ‘A’ or above			students shall obtain a grade ‘A’ or above

5. 10 Master's-Level Programme –

M.Tech.(Automobile Engineering)

B.Tech + M.Tech (AME)- Integrated

5.10.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Automobile Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.10.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements. 2. The students shall have the ability to apply research knowledge and methods to solve engineering problems 3. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 4. Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur 5. The student will have the ability to support and practice independent and life-long learning for professional development. 6. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.10.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme of M.Tech Automobile Engineering will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.10.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve complex problems using concepts of computer science & engineering. 2. The student will identify, formulate research literature and analyze complex automobile engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences 3. The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations 4. The student will carry out investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions 5. The student will create, select and apply appropriate techniques, resources and modern engineering tools including prediction and modelling to different automobile engineering activities as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change

5.10.5 **Programme Operational Outcomes**

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.10.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs). The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
Name of the programme						
Learning Outcome 1	√	√				
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				
Learning Outcome 5	√	√				
Learning Outcome 6			√			
Learning Outcome 7			√			
Learning Outcome 8				√		

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	
Learning Outcome 12						√

5.10.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of automobile engineering	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze automobile engineering problems reaching substantiated conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		using first principles of mathematics, natural sciences, and engineering sciences						grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions automobile engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory			
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and tools, necessary for engineering practice as per the Industrial trends with an understanding	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		of the limitations						
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal

								and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	*Atleast 85% students shall qualify the exam*	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to	Foreign Business Language Rubrics	UG/PLO9/D/FBL	*Atleast 85% students shall qualify the exam*	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)

		undertake a common goal in multidisciplinary settings				Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	*Atleast 85% students shall qualify the exam*	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			

11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above

5.11 Masters

M.Tech.(Industrial & Production Engineering)

5.11.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Industrial & Production Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.11.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives

1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements.
2. The students shall have the ability to apply research knowledge and methods to solve engineering problems
3. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts.
4. Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur
5. The student will have the ability to support and practice independent and life-long learning for professional development.
6. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.11.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme of M.Tech Industrial & Production Engineering will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.

6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.11.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve complex problems using concepts of industrial & production engineering. 2. The student will identify, formulate research literature and analyze complex industrial & production engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences 3. The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations 4. The student will carry out investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions 5. The student will create, select and apply appropriate techniques, resources and modern engineering tools including prediction and modelling to different engineering activities as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change

5.11.5 **Programme Operational Outcomes**

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.11.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs). The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
Name of the programme						
Learning Outcome 1	√	√				
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				
Learning Outcome 5	√	√				
Learning Outcome 6			√			
Learning Outcome 7			√			
Learning Outcome 8				√		

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	
Learning Outcome 12						√

5.11.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of industrial & production engineering	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze industrial & production engineering problems reaching substantiated	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		conclusions using first principles of mathematics, natural sciences, and engineering sciences						grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions automobile engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory			
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and tools, necessary for engineering practice as per the Industrial trends with an understanding	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		of the limitations						
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal

								and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	*Atleast 85% students shall qualify the exam*	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to	Foreign Business Language Rubrics	UG/PLO9/D/FBL	*Atleast 85% students shall qualify the exam*	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)

		undertake a common goal in multidisciplinary settings				Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	*Atleast 85% students shall qualify the exam*	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			

11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above

5.12 Masters

M.Tech.(Mechatronics Engineering)

5.12.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Mechatronics Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.12.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives

1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements.
2. The students shall have the ability to apply research knowledge and methods to solve engineering problems
3. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts.
4. Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur
5. The student will have the ability to support and practice independent and life-long learning for professional development.
6. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.12.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme of M.Tech Mechatronics Engineering will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.

6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.12.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve complex problems using concepts of Mechatronics Engineering 2. The student will identify, formulate research literature and analyze complex Mechatronics Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences 3. The student will create solutions for Mechatronics Engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations 4. The student will carry out investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions 5. The student will create, select and apply appropriate techniques, resources and modern engineering tools including prediction and modelling to different engineering activities as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change

5.12.5 **Programme Operational Outcomes**

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.12.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs). The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
Name of the programme						
Learning Outcome 1	√	√				
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				
Learning Outcome 5	√	√				
Learning Outcome 6			√			
Learning Outcome 7			√			
Learning Outcome 8				√		

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	
Learning Outcome 12						√

5.12.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Mechatronics Engineering	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze Mechatronics Engineering problems reaching substantiated conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		using first principles of mathematics, natural sciences, and engineering sciences						grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions Mechatronics Engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory			
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and tools, necessary for computing practice as per the Industrial trends with an understanding	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		of the limitations						
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal

								and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	*Atleast 85% students shall qualify the exam*	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to	Foreign Business Language Rubrics	UG/PLO9/D/FBL	*Atleast 85% students shall qualify the exam*	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)

		undertake a common goal in multidisciplinary settings				Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	*Atleast 85% students shall qualify the exam*	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			

11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above

5.13 M.Tech.(Thermal & Fluid Sciences)

5.13.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Thermal & Fluid Sciences as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.13.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements. 2. The students shall have the ability to apply research knowledge and methods to solve engineering problems 3. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 4. Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur 5. The student will have the ability to support and practice independent and life-long learning for professional development. 6. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.13.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme of M.Tech Thermal & Fluid Sciences will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.13.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve complex problems using concepts of Thermal & Fluid Sciences. 2. The student will identify, formulate research literature and analyze complex automobile engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences 3. The student will create solutions for engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations 4. The student will carry out investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions 5. The student will create, select and apply appropriate techniques, resources and modern engineering tools including prediction and modelling to different engineering activities as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change

5.13.5 **Programme Operational Outcomes**

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.13.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs). The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
Name of the programme						
Learning Outcome 1	√	√				
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				
Learning Outcome 5	√	√				
Learning Outcome 6			√			
Learning Outcome 7			√			
Learning Outcome 8				√		

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	
Learning Outcome 12						√

5.13.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of thermal and fluid sciences	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze engineering problems reaching substantiated conclusions using first	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		principles of mathematics, natural sciences, and engineering sciences						grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory			
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and tools, necessary for engineering practice as per the Industrial trends with an understanding	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		of the limitations						
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal

								and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Comprehensive Examination	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	*Atleast 85% students shall qualify the exam*	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to	Foreign Business Language Rubrics	UG/PLO9/D/FBL	*Atleast 85% students shall qualify the exam*	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)

		undertake a common goal in multidisciplinary settings				Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	*Atleast 85% students shall qualify the exam*	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade ‘A’ (>=75-100%)			

11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change	Comprehensive Exam	UG/PLO/D/CE	Atleast 40% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 80% of the students shall be marks satisfactory	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above

5.14 Master's-Level Programme –

M. Tech (Electronics & Communication Engineering)

5.14.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Electronics & Communication as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5. 14.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per industry and societal requirements. 2. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. 5. The student will have the ability to support and practice independent and life-long learning for professional development.

5. 14.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5. 14.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Electronics and Communication Engineering. 2. The student will identify, formulate research literature and analyze Electronics and Communication Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions. 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practices as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, economic, global, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5. 14.5Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5. 14.6 Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)

The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
Name of the programme						
Learning Outcome 1	√	√				
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 5	√	√				
Learning Outcome 6			√			
Learning Outcome 7			√			
Learning Outcome 8				√		
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	
Learning Outcome 12					√	√

5. 14.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	PLO1	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	PLO2	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

								grade ‘A’ or above
3	Design/Development of Solutions	PLO3	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
4	Problem Analysis	PLO4	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a			

					grade ‘A’ or above			grade ‘A’ or above
5	Modern Tool Usage	PLO5	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
6	The Engineer & Society	PLO6	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

					grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues			grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues
7	Environment & Sustainability	PLO7	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their

					responsibility towards environment, society, ethics, health, safety, legal and cultural issues			responsibility towards environment, society, ethics, health, safety, legal and cultural issues
8	Ethics	PLO8	Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			

			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% of the students shall qualify the exam.	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
9	Individual and Team Work	PLO9	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% of the students shall qualify the exam.	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above			

10	Communication	PLO10	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% of the students shall qualify the exam.	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	PLO11	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’

								(>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
12	Lifelong Learning	PLO12	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

5.15 Master's-Level Programme –

M. Tech (Wireless Communication)

5.15.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Wireless Communication as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.15.2 Programme Educational Objectives (PEOs)

Educational Goals
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements. 2. The students shall have the ability to apply research knowledge and methods to solve engineering problems 3. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 4. Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur 5. The student will have the ability to support and practice independent and life-long learning for professional development. 6. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.15.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.15.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Electronics and Communication Engineering. 2. The student will identify, formulate research literature and analyze Electronics and Communication Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions. 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practices as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, economic, global, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5.15.5Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.15.6 Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)

The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
Name of the programme						
Learning Outcome 1	√	√				
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 5	√	√				
Learning Outcome 6			√			
Learning Outcome 7			√			
Learning Outcome 8				√		
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	
Learning Outcome 12					√	√

5.15.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	PLO1	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	PLO2	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

								grade ‘A’ or above
3	Design/Development of Solutions	PLO3	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
4	Problem Analysis	PLO4	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a			

					grade ‘A’ or above			grade ‘A’ or above
5	Modern Tool Usage	PLO5	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
6	The Engineer & Society	PLO6	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

					grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues			grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues
7	Environment & Sustainability	PO7	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their

					responsibility towards environment, society, ethics, health, safety, legal and cultural issues			responsibility towards environment, society, ethics, health, safety, legal and cultural issues
8	Ethics	PLO8	Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			

			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% of the students shall qualify the exam.	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
9	Individual and Team Work	PLO9	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% of the students shall qualify the exam.	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above			

10	Communication	PLO10	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% of the students shall qualify the exam.	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	PLO11	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’

								(>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
12	Lifelong Learning	PLO12	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

5.16 Master's-Level Programme –

M. Tech (VLSI)

5.16.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Very Large Scale Integration as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.16.2 Programme Educational Objectives (PEOs)

Educational Goals
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements. 2. The students shall have the ability to apply research knowledge and methods to solve engineering problems 3. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 4. Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur 5. The student will have the ability to support and practice independent and life-long learning for professional development. 6. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.16.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.16.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Electronics and Communication Engineering. 2. The student will identify, formulate research literature and analyze Electronics and Communication Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions. 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practices as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, economic, global, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5.16.5Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.16.6 Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)

The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
Name of the programme						
Learning Outcome 1	√	√				
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				
Learning Outcome 5	√	√				

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 6			√			
Learning Outcome 7			√			
Learning Outcome 8				√		
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	
Learning Outcome 12					√	√

5.16.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	PLO1	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	PLO2	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

								grade ‘A’ or above
3	Design/Development of Solutions	PLO3	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
4	Problem Analysis	PLO4	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a			

					grade ‘A’ or above			grade ‘A’ or above
5	Modern Tool Usage	PLO5	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
6	The Engineer & Society	PLO6	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

					grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues			grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues
7	Environment & Sustainability	PLO7	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their

					responsibility towards environment, society, ethics, health, safety, legal and cultural issues			responsibility towards environment, society, ethics, health, safety, legal and cultural issues
8	Ethics	PLO8	Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			

			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% of the students shall qualify the exam.	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
9	Individual and Team Work	PLO9	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% of the students shall qualify the exam.	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above			

10	Communication	PLO10	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% of the students shall qualify the exam.	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	PLO11	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’

								(>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
12	Lifelong Learning	PLO12	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubrics	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

5.17 BACHELOR'S-Level Programme–

Bachelor of Technology in Electrical & Electronics Engineering

5.17.1 Mission Statement

ProgrammeMission
"To provide education in the futuristic and emerging frontier areas of Electrical & Electronics Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per industry and societal requirements. 2. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. 5. The student will have the ability to support and practice independent and life-long learning for professional development.

5.17.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.17.4 Programme Learning Outcomes

Learning Outcomes	
1.	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Electrical & Electronics Engineering.
2.	The student will identify, formulate research literature and analyze electrical & electronics engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
3.	The student will create solutions for electrical & electronics engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations..
4.	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
5.	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for engineering practice as per Industrial trends with an understanding of the limitations.
6.	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice.
7.	The student will recognize the impact of the professional engineering solutions in political, global, economic, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development.
8.	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice.
9.	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings.
10.	The student will use effective communication to cater to both technical and non-technical audiences.
11.	The student will 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 as well as to manage projects in multidisciplinary environments.
12.	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5.17.5 Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.17.6 Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
BACHELOR'S LEVEL PROGRAMS					
Name of the programme					
Learning Outcome 1	√				
Learning Outcome 2	√				
Learning Outcome 3	√				
Learning Outcome 4	√				
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			

Broad-Based Student Learning Goals (PEOs) Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 8			√		
Learning Outcome 9				√	
Learning Outcome 10				√	
Learning Outcome 11				√	
Learning Outcome 12					√

5.17.7 Student Learning Assessment for B.Tech in Electrical & Electronics Engineering

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Electrical & Electronics Engineering.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze electrical & electronics engineering problems reaching substantiated	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		conclusions using first principles of mathematics, natural sciences, and engineering sciences			grade ‘A’ or above			grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions for electrical & electronics engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
4	Problem Analysis	The student will carry out investigations of problems using	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a

		research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.			‘A’ (>=75-100%)			grade‘A’ (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for engineering practice as per Industrial trends with an understanding of the limitations.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		global, economic, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues
8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below

			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% students shall qualify the exam	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			

			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			

11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above

5.18 Bachelor of Technology in Electronics & Instrumentation Engineering

5.18. 1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Electronics & Instrumentation Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.18.2 Programme Educational Objectives (PEOs)

Educational Goals
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per industry and societal requirements. 2. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. 5. The student will have the ability to support and practice independent and life-long learning for professional development.

5.18.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.18.4 Programme Learning Outcomes

Learning Outcomes	
1.	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Electronics & Instrumentation Engineering.
2.	The student will identify, formulate research literature and analyze Electronics & Instrumentation engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
3.	The student will create solutions for Electronics & Instrumentation engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations..
4.	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
5.	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for engineering practice as per the Industrial trends with an understanding of the limitations.
6.	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice.
7.	The student will recognize the impact of the professional engineering solutions in political, global, economic, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development.
8.	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice.
9.	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings.
10.	The student will use effective communication to cater to both technical and non-technical audiences.
11.	The student will 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 as well as to manage projects in multidisciplinary environments.

12.	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5.18.5 Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.

Operational Outcomes	
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.18.6 Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
BACHELOR'S LEVEL PROGRAMS					
Name of the programme					
Learning Outcome 1	√				
Learning Outcome 2	√				

Broad-Based Student Learning Goals (PEOs) Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 3	√				
Learning Outcome 4	√				
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			
Learning Outcome 8			√		
Learning Outcome 9				√	
Learning Outcome 10				√	
Learning Outcome 11				√	
Learning Outcome 12					√

5.18.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Electronics & Instrumentation Engineering.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze Electronics & Instrumentation Engineering problems reaching substantiated conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		using first principles of mathematics, natural sciences, and engineering sciences			grade ‘A’ or above			grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions for Electronics & Instrumentation Engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
4	Problem Analysis	The student will carry out investigations of problems using	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a

		research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.			‘A’ (>=75-100%)			grade‘A’ (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for engineering practice as per the Industrial trends with an understanding of the limitations.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		global, economic, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues
8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below

			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% students shall qualify the exam	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			

			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			

11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubric	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above

5.19 Master's-Level Programme–

Master of Technology in Power Systems

5.19.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Power Systems as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.19.2 Programme Educational Objectives (PEOs)

Educational Goals
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements. 2. The students shall have the ability to apply research knowledge and methods to solve engineering problems 3. The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 4. Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur 5. The student will have the ability to support and practice independent and life-long learning for professional development. 6. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.19.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.19.4 Programme Learning Outcomes

Programme Learning Outcomes	
1.	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Power Systems Engineering.
2.	The student will identify, formulate research literature and analyze Power Systems Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
3.	The student will create solutions for Power Systems Engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations..
4.	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
5.	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for engineering practice as per the Industrial trends with an understanding of the limitations.
6.	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice.
7.	The student will recognize the impact of the professional engineering solutions in political, global, economic, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development.
8.	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice.
9.	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings.
10.	The student will use effective communication to cater to both technical and non-technical audiences.

11.	The student will 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 as well as to manage projects in multidisciplinary environments.
12.	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues

5.19.5Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.19.6 Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
Name of the programme						
Learning Outcome 1	√	√				
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				
Learning Outcome 5	√	√				
Learning Outcome 6			√			

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 7			√			
Learning Outcome 8				√		
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	
Learning Outcome 12						√

5.19.7 **Student Learning Assessment for M.Tech Power Systems**

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Power System engineering.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze Power System engineering problems reaching substantiated	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		conclusions using first principles of mathematics, natural sciences, and engineering sciences			grade ‘A’ or above			grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions for Power System engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)

		modern engineering and IT tools including prediction and modelling to different power system engineering activities as per the Industrial trends with an understanding of the limitations.	Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their

					towards environment, society, ethics, health, safety, legal and cultural issues			responsibility towards environment, society, ethics, health, safety, legal and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety,	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health,

					legal and cultural issues			safety, legal and cultural issues
8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/ BS	Atleast 85% students shall qualify the exam	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings	Foreign Business Language Rubrics	UG/PLO9/D/F BL	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above			
10	Communication	The student will use effective communication to cater to both technical and	Business Communication Rubrics	UG/PLO10/D/BC	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)

		non-technical audiences	Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplina	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

		ry environments						
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

5.20

Master of Technology in Control Systems

5.20.1Mission Statement

ProgrammeMission
"To provide education in the futuristic and emerging frontier areas of Electrical Engineering and Control Systems as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.20.2 Programme Educational Objectives (PEOs)

	Educational Goals
1.	The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products through research and provide solutions as per industry and societal requirements.
2.	The students shall have the ability to apply research knowledge and methods to solve engineering problems
3.	The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts.
4.	Students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur
5.	The student will have the ability to support and practice independent and life-long learning for professional development.
6.	Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

5.20.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.20.4 Programme Learning Outcomes

	Programme Learning Outcomes
1.	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Control Systems Engineering.
2.	The student will identify, formulate research literature and analyze Control Systems Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
3.	The student will create solutions for Control Systems Engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations..
4.	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
5.	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for engineering practice as per the Industrial trends with an understanding of the limitations.
6.	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice.
7.	The student will recognize the impact of the professional engineering solutions in political, global, economic, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development.
8.	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice.
9.	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings.
10	The student will use effective communication to cater to both technical and non-technical audiences.

11	The student will 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 as well as to manage projects in multidisciplinary environments.
12	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5.20.5 Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.20.6 Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
MASTER'S LEVEL PROGRAMS						
Name of the programme						
Learning Outcome 1	√	√				
Learning Outcome 2	√	√				
Learning Outcome 3	√	√				
Learning Outcome 4	√	√				
Learning Outcome 5	√	√				
Learning Outcome 6			√			

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
Learning Outcome 7			√			
Learning Outcome 8				√		
Learning Outcome 9					√	
Learning Outcome 10					√	
Learning Outcome 11					√	
Learning Outcome 12						√

5.20.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Control system engineering	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze Control system engineering problems reaching substantiated conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		using first principles of mathematics, natural sciences, and engineering sciences						grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions for Control system engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Summer Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above			
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to different control system engineering activities as per the Industrial trends with an	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		understanding of the limitations.						
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibilit y towards environment, society, ethics, health, safety, legal

								and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibilit y towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% students shall qualify the exam	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)

		common goal in multidisciplinary settings				Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Dissertation Rubric	UG/PLO/D/DN	Atleast 40% of the students	Industry Internship	UG/PLO/ID/II	Atleast 40% of the

		technological change			shall obtain a grade ‘A’ or above			students shall obtain a grade ‘A’ or above

5.21 Bachelor's Level Programmes

B.Tech (Computer Science & Engineering – 3C)

5.21.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Computer Science & Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To provide international exposure and acquaint the students to the global best practices in their field and thus prepare them for global competent workforce. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.21.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per industry and societal requirements, globally. 2. The students shall have the ability to examine the impact of global engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers.

5. The student will have the ability to support and practice independent and life-long learning for professional development.

5.21.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.21.4 Programme Learning Outcomes

Programme Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of computer science & engineering. 2. The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions. 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practices as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, economic, global, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5.21.5 Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.21.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs). The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcome (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
BACHELOR'S LEVEL PROGRAMS					
B.TECH					
Learning Outcome 1	√				
Learning Outcome 2	√				
Learning Outcome 3	√				
Learning Outcome 4	√				
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			
Learning Outcome 8			√		
Learning Outcome 9				√	
Learning Outcome 10				√	

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcome (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 11				√	
Learning Outcome 12					√

5.21.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of computer science & engineering	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		conclusions using first principles of mathematics, natural sciences, and engineering sciences						grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practices as	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		per the Industrial trends with an understanding of the limitations.						
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal

								and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% of the students shall qualify the exam	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% of the students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)

		undertake a common goal in multidisciplinary settings				Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above			
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% of the students shall qualify the exam	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students	Industry Internship	UG/PLO/ID/II	Atleast 40% of the

		of technological change			shall obtain a grade ‘A’ or above			students shall obtain a grade ‘A’ or above
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

Bachelor's-Level Programme –

B.Tech (Computer Science & Engineering – International)

5.22.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Computer Science & Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To provide opportunity to pursue their education in the best international higher educational institutions to understand new cultures and a discipline from a global perspective. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.22.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per international industry and societal requirements. 2. The students shall have the ability to examine the impact of global engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers.

5. The student will have the ability to support and practice independent and life-long learning for professional development.

5.22.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.22.4 Programme Learning Outcomes

Programme Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of computer science & engineering. 2. The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions. 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practices as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, economic, global, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5.22.5 Programme Operational Outcomes

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.22.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs). The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcome (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
BACHELOR'S LEVEL PROGRAMS					
B.TECH					
Learning Outcome 1	√				
Learning Outcome 2	√				
Learning Outcome 3	√				
Learning Outcome 4	√				
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			
Learning Outcome 8			√		
Learning Outcome 9				√	
Learning Outcome 10				√	

Broad-Based Student Learning Goals (PEOs) / Programme Learning Outcome (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 11				√	
Learning Outcome 12					√

5.22.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of computer science & engineering	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a

		conclusions using first principles of mathematics, natural sciences, and engineering sciences						grade ‘A’ or above
3	Design/Development of Solutions	The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above

4	Problem Analysis	The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
5	Modern Tool Usage	The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practices as	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		per the Industrial trends with an understanding of the limitations.						
6	The Engineer & Society	The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal

								and cultural issues
7	Environment & Sustainability	The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% of the students shall qualify the exam	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
9	Individual and Team Work	The student will demonstrate effectiveness as an individual and as a member	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% of the students shall	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A'

		or leader of team assembled to undertake a common goal in multidisciplinary settings			qualify the exam				(>=75-100%)
						Industry Internship		UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
10	Communication	The student will use effective communication to cater to both technical and non-technical audiences	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% of the students shall qualify the exam	Student Exit Survey		UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship		UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain				

					grade ‘A’ (>=75-100%)			
11	Project Management & Finance	The student will 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 as well as to manage projects in multidisciplinary environments	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
12	Lifelong Learning	The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a

					a grade ‘A’ or above			grade ‘A’ or above
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

5.23 BACHELOR'S-Level Programme –

B.Tech Electronics & Communication Engineering – 3 Continent

5.23.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Electronics & Communication Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To provide international exposure and acquaint the students to the global best practices in their field and thus prepare them for global competent workforce. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.23.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per industry and societal requirements, globally. 2. The students shall have the ability to examine the impact of global engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. 5. The student will have the ability to support and practice independent and life-long learning for professional development.

5.23.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme of B.Tech ECE will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs.
8	The Programme will create opportunities for international exposure for its students and faculty.

5.23.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Electronics and Communication Engineering. 2. The student will identify, formulate research literature and analyze Electronics and Communication Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for computer science & engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions. 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practices as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, economic, global, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues.

5.23.5Programme Operational Outcomes

Operational Outcomes
1. The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2. The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3. The student will graduate in timely manner.
4. The student and faculty shall have academic facilities, technological resources for teaching and learning.
5. The student will earn achievements in inter-university Extra Curricular activities.
6. The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7. The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8. The faculty will facilitate cultivation of cross cultural humanitarian values.
9. The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10. The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
11. The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12. The faculty will support all the students for quality placements or join family business or start their own venture.

5.23.6 Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)

The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
BACHELOR'S LEVEL PROGRAMS					
Name of the programme					
Learning Outcome 1	√				
Learning Outcome 2	√				
Learning Outcome 3	√				
Learning Outcome 4	√				

Broad-Based Student Learning Goals (PEOs) / Intended Student Learning Outcomes (SLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			
Learning Outcome 8			√		
Learning Outcome 9				√	
Learning Outcome 10				√	
Learning Outcome 11				√	
Learning Outcome 12					√

5.6.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	The student will demonstrate the knowledge of mathematics, science, engineering fundamentals, and domain knowledge in Electronics and Communication Engineering to the solution of complex engineering problems.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
2	Investigation	The student will demonstrate an ability to identify, formulate, research literature, and analyze complex engineering problems	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		reaching substantiated conclusions using principles of mathematics, natural sciences, and engineering sciences with focus in Electronics and Communication Engineering.						
3	Design/Development of Solutions	The student will demonstrate an ability to design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration public health and safety,	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above

		economical, cultural, societal, and environmental considerations.						
4	Problem Analysis	The student will demonstrate the research-based knowledge and research methods including design and conduct of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
5	Modern Tool Usage	The student will create, select, and apply appropriate techniques,	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)

		resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
6	The Engineer & Society	The student will be able to apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment,	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above 100% of the students shall pursue their responsibility towards environment,

		engineering practice.			society, ethics, health, safety, legal and cultural issues			society, ethics, health, safety, legal and cultural issues

7	Environment & Sustainability	The student will be able to understand the impact of the professional engineering solutions in political, global, economic, societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall pursue their responsibility towards environment, society, ethics, health, safety, legal and cultural issues

8	Ethics	The student will demonstrate ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above 100% of the students shall have plagiarism 15% or below	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%) 100% of the students shall have plagiarism 15% or below
			Comprehensive Exam	UG/PLO/D/CE Framework	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)			
			Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 85% of the students shall qualify the exam.	Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade 'A' or above
9	Individual and Team Work	The student will be able to function effectively as an	Foreign Business Language Rubrics	UG/PLO9/D/FBL	Atleast 85% of the students shall	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A'

		individual, and as a member or leader in diverse teams, and in multidisciplinary settings.			qualify the exam.			(>=75-100%)
						Industry Internship	UG/PLO/ID/ II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)			
10	Communication	The student will be able to 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,	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 85% of the students shall qualify the exam.	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry feedback	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above
			Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall			

		make effective presentations, and give and receive clear instructions.			obtain grade ‘A’ (>=75-100%)			
11	Project Management & Finance	The student will be able to demonstrate knowledge and understanding of Engineering and Management Principles as an individual, and as a member or leader in diverse teams considering economical and financial factors. Also, The student will be able to participate and succeed in competitive examinations.	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade‘A’ (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry feedback	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade ‘A’ or above

12	Lifelong Learning	The student will understand the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological changes and contemporary issues.	Comprehensive Exam	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>=75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade'A' (>=75-100%)
			Major Project Rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry feedback	UG/PLO/ID/II	Atleast 40% of the students shall obtain a grade 'A' or above

5.24 Bachelor's-Level Programme –

B.Tech.(Civil Engineering – 3 Continent)

5.24.1 Mission Statement

Programme Mission
"To provide education in the futuristic and emerging frontier areas of Civil Engineering as per latest technologies of Industry 4.0 through knowledge, learning, research and innovation. To provide international exposure and acquaint the students to the global best practices in their field and thus prepare them for global competent workforce. To develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals with regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action"

5.24.2 Programme Educational Objectives (PEOs)

Programme Educational Objectives
1. The students shall have the ability to apply knowledge of science, engineering & technology to design and develop innovative products/ solutions as per industry and societal requirements, globally. 2. The students shall have the ability to examine the impact of global engineering solutions in societal, health, safety, legal, cultural and environmental contexts. 3. The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and as an entrepreneur. 4. Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. 5. The student will have the ability to support and practice independent and life-long learning for professional development.

5.24.3 Programme Operational Objectives

S.No	Operational Goals
1	The Programme will create appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students
2	The Programme will provide Professional development programmes/opportunities to the faculty and staff to regularly upgrade their knowledge and skills and bring excellence in teaching, learning and research
3	The Programme will demonstrate sensitivity to the diverse needs of students and accordingly develop facilities and services.
4	The Programme will continuously strive to build strong industry interaction, alumni networks and empanelment of expertise from industry.
5	The Programme will continually improve the quality of facilities, services, resources and processes with an aim to attain national and international accreditations and institutional ranking.
6	The Programme will arrange all necessary support system for the students to facilitate campus recruitment, higher education or starting their own ventures.
7	The Programme will act ethically to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programs
8	The Programme will create opportunities for international exposure for its students and faculty.

5.24.4 Programme Learning Outcomes

Intended Learning Outcomes
1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of Civil Engineering. 2. The student will identify, formulate research literature and analyse Civil Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, economical, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions 5. The student will create, select and apply appropriate techniques, resources and modern engineering and Civil Engineering tools, necessary for engineering practice as per the Industrial trends with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in political, global, economic, societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will 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 as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change and contemporary issues

5.24.5 **Programme Operational Outcomes**

Operational Outcomes	
1	The faculty will use appropriate methodology and pedagogical tools for teaching, learning and development.
2	The curriculum will be contemporary and relevant to meet industry requirements and benchmarked on global standards by incorporating feedback from all the stakeholders.
3	The student will graduate in timely manner.
4	The student and faculty shall have academic facilities, technological resources for teaching and learning.
5	The student will earn achievements in inter-university Extra Curricular activities.
6	The faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7	The faculty and students will integrate ethics and values in teaching and Learning, in theory and practice.
8	The faculty will facilitate cultivation of cross cultural humanitarian values.
9	The faculty will facilitate joint research collaborations, invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure..
10	The faculty will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.

Operational Outcomes	
11	The faculty shall develop and maintain strong relationship with corporate and maintain lifelong alumni network and keep the curriculum responsive to industry needs.
12	The faculty will support all the students for quality placements or join family business or start their own venture.

5.24.6 PEO's – PLO mapping

Mapping of Intended Programme Learning Outcomes to Broad-Based Programme Educational Objectives (PEOs)
The broad-based student learning goals identified in Section I above encompass the intended student learning outcomes as articulated in this section, and are general composites or summaries of these outcomes. These relationships are summarized in the outcomes-to-goals mapping below (**Note: √ in a given cell of the table indicates the intended learning outcome in that row is associated with the learning goal in that column**.):

Broad-Based Program Learning Goals (PEOs) / Intended Program Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
BACHELOR'S LEVEL PROGRAMS					

Broad-Based Program Learning Goals (PEOs) Intended Program Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Name of the programme: B.Tech					
Learning Outcome 1	√				
Learning Outcome 2	√				
Learning Outcome 3	√				
Learning Outcome 4	√				
Learning Outcome 5	√				
Learning Outcome 6		√			
Learning Outcome 7		√			
Learning Outcome 8			√		
Learning Outcome 9				√	

Broad-Based Program Learning Goals (PEOs) Intended Program Learning Outcomes (PLOs)	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
Learning Outcome 10				√	
Learning Outcome 11				√	
Learning Outcome 12					√

5.24.7 Student Learning Assessment

S.No	Attributes	PLO's	Direct	Tool No for Direct Assessment	Target Performance	Indirect	Tool No for Indirect Assessment	Target Performance
1	Engineering Knowledge	PLO1	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade 'A' (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade 'A' or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade 'A' or above. .
2	Investigation	PLO2	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade 'A' (>= 75-100%)

			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .
3	Design/Development of Solutions	PLO3	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .

4	Problem Analysis	PLO4	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .
5	Modern Tool Usage	PLO5	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above.

								.
6	The Engineer & Society	PLO6	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .
7	Environment & Sustainbility	PLO7	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .

8	Ethics	PLO8	Plagiarism Checking of NTCC Report		100% Students are checked for plagiarism in NTCC report submissions and are allowed to appear for vivavoce upon obtaining plagiarism % below 15%.	Feedback of Industry Internship Guide	UG/PLO/ID/ II	60% students are rated between 4-5 range on the Likert Scale in the feedback by Industry guides.
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade 'A' (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade 'A' (>= 75-100%)
9	Individual and Team Work	PLO9	Behavioural Science Rubrics	UG/PLO9/D/BS	Atleast 80% of the students shall pass the exam .	Student Exit Survey	UG/PLO/ID/ ES	70% students response range between 4-5 on the Likert Scale in the Student Exit Survey.

						Alumni Survey	UG/PLO/ID/ AS	70% students response range between 4-5 on the Likert Scale in the Alumni Survey.
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey Industry Internship	UG/PLO/ID/ ES UG/PLO/ID/ II	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)

			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above			40% of the students shall obtain a grade ‘A’ or above. .
10	Communication	PLO10	Business Communication Rubrics	UG/PLO10/D/ BC	Atleast 80% of the students shall pass the exam .	Student Exit Survey	UG/PLO/ID/ ES	70% students response range between 4-5 on the Likert Scale in the Student Exit Survey.
						Alumni Survey	UG/PLO/ID/ AS	70% students response range between 4-5 on the Likert Scale in the Alumni Survey.
			Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above.

								.
11	Project Management & Finance	PLO11	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)
			Major Project rubrics	UG/PLO/D/P2	Atleast 40% of the students shall obtain a grade ‘A’ or above	Industry Internship	UG/PLO/ID/ II	40% of the students shall obtain a grade ‘A’ or above. .

12	Lifelong Learning	PLO12	Comprehensive Examination	UG/PLO/D/CE	Atleast 20% of the students shall obtain grade ‘A’ (>= 75-100%)	Student Exit Survey	UG/PLO/ID/ ES	Atleast 85% of the students shall give a grade ‘A’ (>= 75-100%)

Section VI

Domain Operational Outcomes & Operational Outcome Assessment Plan

6.1 Operational Assessment

#	Broad-Based Operational Goals	Intended Operational Outcomes for the Domain	Assessment Measures/Methods for Intended Operational Outcomes	Performance Objectives (Targets/Criteria)
1	FET intends to facilitate academically conducive environment and infrastructure to achieve excellence in teaching, learning and research.	• FET will encourage faculty to use appropriate methodology and pedagogical tools for teaching, learning and development of students. • The students of FET will graduate in timely manner.	• Student feedback of course faculty. • Faculty qualification and experience files. • Graduation rate in convocation report. - on completion of Registration period (N) during extended period (N+1+1 for PG and N+2+1 for UG)	• All faculty shall have a minimum criteria of greater than 70% overall score in student feedback. • All faculty to be either M.Tech/PhD or shall have industry experience. • At least 80% students shall graduate on completion of Registration period (N)

				• 80% of remaining students shall pass during extended period (N+1+1 for PG and N+2+1 for UG)
2	FET will provide ample opportunities to its students to participate in curricular, co-curricular and extracurricular activities for their holistic development.	• The students of FET will participate in Co-Curricular and Extra Curricular activities	• Functional and area specific club, Committees, Sports Events, co-curricular and extracurricular activities and student's participation in inter institutional competition. • List of Award winners	• Every student shall be a part of at least one Club or Committee or inter institutional competition. • .
3	FET will facilitate environment for innovation and research excellence for the intellectual growth of faculty.	• FET shall maintain appropriate academic facilities and technological Resources for teaching and learning.	Faculty data about Research work and other Scholar activities such as: • Scholarship of teaching; published and unpublished articles, manuscripts, books, curriculum review and evaluation of teaching material. • Scholarship of Discovery: published articles, manuscripts, papers	

			presented, dissertations/ thesis, • Scholarship of Integration: published articles, manuscripts, papers presented, dissertations/ thesis, conference and workshops attended. • Scholarship of application: published articles, manuscripts, papers presented, consultations, policy analysis, programme evaluation. • Professional activities: Routine consulting, conference, workshop, professional meeting attendance, professional membership.	
4	FET will inculcate core values and ethical conduct amongst students, faculty and staff.	• The FET will integrate ethics and values in teaching, theory and practice, develop and retain excellent students, faculty and staff.	• Attrition Rate • Courses embedded in curriculum such as Behavioral Science Courses, Human Values and Community Outreach, etc. • Plagiarism check. • Feedback system.	• Attrition rate shall be below 10% annually • Faculty Feedback shall be taken for each course. • 80% faculty shall have 4 or 5 on 5 point Likert Scale.

5	FET will encourage cultural diversity and a sense of social and environmental responsibility.	• FET will facilitate joint research collaborations; invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure.	• List of community/ social sector projects/ activities/ engagements. • Organizing Cultural programmes. • Day of Belongingness. • Celebration of festivals for culturally diverse group of students.	• Atlease 80% faculty and students should be engaged in organizing/ participating the various events and activities
6	FET will provide ample opportunities for international exposure to faculty and students.		• Study Abroad Programme • Exchange Programs for students. • Conferences/ Seminars organized by national and international speakers and delegates. • Collaborative Research.	• 100% students and faculty of FET shall be offered an opportunity for international exposure through various programs designed for the purpose.
7	FET will be involved in continual improvement of processes and systems and aim to attain national and international accreditations and university rankings.	• The curriculum is contemporary, developed in collaborative consultation with all the stakeholders, benchmarked with global standards and relevant to the industry requirements	• Ranking in national and international ranking agencies. • Accreditation at institutions and programme levels.	• Continuous review and enhancement of all the required systems and processes to upgrade/ maintain high standards

		• FET will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies		
8	FET will build a strong industry interaction by way of alumni networks and empanelment of expertise from industry.	• FET will develop and maintain strong relationship with corporate and support all the students for quality placements or join family business or start their own venture.		
9	FET will facilitate employment opportunities and also support students to start their own ventures.			
10	FET will facilitate good governance in discharge of responsibilities and execution of policies and programs.	• FET will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.		

6.2 Operational Outcomes

	Intended Operational Outcomes
1.	FET will encourage faculty to use appropriate methodology and pedagogical tools for teaching, learning and development of students.
2.	The curriculum is contemporary, developed in collaborative consultation with all the stakeholders, benchmarked with global standards and relevant to the industry requirements.
3.	The students of FET will graduate in timely manner.
4.	FET shall maintain appropriate academic facilities and technological Resources for teaching and learning.
5.	The students of FET will participate in Co Curricular and Extra Curricular activities.
6.	Faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.
7.	The FET will integrate ethics and values in teaching, theory and practice, develop and retain excellent students, faculty and staff.

8.	FET will facilitate joint research collaborations; invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure.
9.	FET will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
10.	FET will develop and maintain strong relationship with corporate and support all the students for quality placements or join family business or start their own venture.

6.3 Operational Outcome Assessment Plan

- *Faculty will be engaged in scholarly and professional activities in order to enhance their competencies and to contribute to the existing Body of Knowledge.*

Section VII

Linkage of Outcomes Assessment with Strategic Planning

Provide a narrative that describes the ways in which the results from implementing your outcomes assessment plan (i.e., changes and improvements needed) are linked to the strategic planning processes of the academic business unit and the institution.

Faculty of Engineering & Technology

- Goals set by University Planning Committee
- Objectives with high priority in strategic planning for desired outcomes

STRATEGIC PROCESS OF CONTINUOUS IMPROVEMENTS