

AMITY UNIVERSITY UTTAR PRADESH

Outcome Assessment Plan

Domain: Domain of Engineering & Technology/Computer Science and Applications
Name of the Institution: Amity Institute of Information Technology
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Date: 2022 - 2023

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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 several 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:*

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- ☐ Demand for broad-based, flexible education in multi/inter- disciplinary subjects.
- ☐ Emphasis on PG courses, research training and institute-industry interaction.
- ☐ 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.
- ☐ 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' feedback. 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 detailed 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 to meet the requirement of 4.0:

- (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 ASSESMENT 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. **Graduate Attributes (GAs) :** Graduate Attributes is a set of individually assessable outcomes that are indicative of the graduate's potential to acquire competencies in that programme.
3. **Educational Objectives:** The Educational Objectives are defined at Domain, Institution and Programme level. The Educational Objectives at the institution\and programme level are aligned with the domain mission. Educational Objectives are the broad statements that described what graduates are expected to attend within few years of graduation.
4. **Operational Objectives:** The Operational Objectives are defined at Domain, Institution and Programme level. The Operational Objectives at the institution and programme level are aligned with the domain mission.
5. **Outcomes:** The Outcomes are defined under the following categories:
 - **Operational Outcomes:** The operational outcomes are defined for the domain and assessed at the domain level.

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- **Programme Learning Outcomes (PLOs)** - Programme Learning Outcomes represent the knowledge, skills and attitudes a student attain at the end of the year/programme. The PLOs are defined for each programme and each PLO is assessed to identify that the established Educational Objectives are achieved.
6. **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.
 7. **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 determine the effectiveness of the programme during the programme review process.
 8. **Programme Review:** Through the review of 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 objectives** are derived from and support the institute mission
 - The **curriculum** is coherent, current and consistent and meet the requirement of Industry 4.0.
 - 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 EDUCATIONAL OBJECTIVES

-----Engineering & Technology-----

3.1 Mission Statement:

Mission Statement
To provide education at all levels in all disciplines of Computer Science Applications 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 Computer Science 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 the courage of conviction and action.

3.2 Educational Objectives at Domain /Faculty level:

S.No	Educational Objectives
1.	The students shall have the ability to apply knowledge of mathematics, science, computing and civil engineering for research, design and development of novel products and solutions as an individual / member of a team/ leader in diverse teams and as an entrepreneur
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
	Students will be able to demonstrate professional attitudes, effective communication and behavioural skills and sustain effective performance in the professional / entrepreneurial careers
4.	The student will have the ability to support and practice independent and life-long learning for professional development

3.3 Graduate Attributes and its Indicators at Domain/Faculty Level:

#	AUUP Graduate Attribute	Domain Graduate Attributes	AUUP Indicators	Domain Indicators
1.	Discipline Knowledge & Expertise	IT and Computer Science Knowledge	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To apply Discipline Specific Knowledge and expertise in the core areas. - To Demonstrate the ability to produce indented outcomes. - To convert theory into practical functioning. - To apply content Knowledge to real life situation. 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To apply the knowledge of mathematics, science, engineering fundamentals, computational techniques, and engineering specialization to solve the problems.
2.	Self-Directed and Active Learning	Self-Directed and Active Learning	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To maximize their potential by utilizing their abilities, & academic excellence. - To take personal responsibility and grasp opportunities for self-development. - To demonstrate perseverance and willingness to learn. - To Think independently, analytically and creatively through self-directed learning 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To choose self-directed and active learning through strong intellectual engagement in independent work relevant to Engineering & Technology Domain maximizing their potential by utilizing abilities and academic excellence. -To think independently, analytically and creatively through self-directed learning
3.	Research and Enquiry	Research enquiry & Design Thinking	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To create new knowledge and opportunities for learning through the process of research and enquiry. - To formulate research designs through qualitative, quantitative and mixed methods - To formulate research designs through qualitative, quantitative and mixed methods. - To exercise critical judgment and critical thinking to create new modes of understanding 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To use research-based knowledge and methods including design of experiments, analysis and interpretation of data, and synthesis of the information to arrive at valid conclusions. -To exercise critical judgment and thinking to create new systems / products / services etc.
4.	Information & Communication Technology Skills	ICT and Modern Engineering Tools Usage	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To develop self-paced learning through various tools and techniques of ICT - To locate, analyse, evaluate, and synthesise information from a wide variety of sources in a planned and timely manner - To Use and apply appropriate media, tools and methodologies to locate, access and use information for critical and creative thinking - To critically evaluate the sources, values, validity and currency of information, through ICT 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To create, select, and apply modern engineering techniques, resources, and IT tools for modelling and simulation of engineering problems. -To develop self-paced learning through various tools and techniques of ICT
5.	Critical Thinking & Problem-Solving Abilities	Critical Thinking & Problem-Solving Abilities	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To identify & conceptualize problems - To demonstrate research skills for effective problems-solving 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p>

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			- To apply critical, creative and evidence-based thinking to conceive innovative responses to future challenges.	-To apply critical, creative and evidence-based thinking for creating solutions of engineering problems and to design system components or processes that meet the specified needs with appropriate consideration for the public health, safety, cultural, societal, and environmental considerations
6.	Communication Skills	Communication Skills	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To possess a high standard of verbal, visual and written communication skills relevant to their fields of study. - To effectively use appropriate communication technologies. - To present information precisely and accurately by utilizing various information technology skills. 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To communicate effectively on engineering activities with the engineering professionals and society at large, such as, being able to comprehend and write effective reports, make effective presentations, give & receive clear instructions by utilizing various Information Technology tools and skills.
7.	Creativity, Innovation & Reflective Thinking	Creativity, Innovation & Reflective Thinking	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To demonstrate the capacity for independent, conceptual and creative thinking - To develop creative and effective responses to intellectual, professional and social challenges 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To demonstrate scientific creativity and reflective thinking to critically evaluate ideas for developing innovative processes and products relevant to industry/societal needs.
8.	Analytical & Decision-Making Ability	Analytical & Decision-Making Ability	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To determine relevant data and evaluate information in order to understand complex situations and make effective decisions - To demonstrate independent thinking and openness to new ideas in decision making - To exhibit proficiency in choosing between two or more alternatives for problem solving - To demonstrate analytical skills in making best choices among alternatives to make effective decisions 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To demonstrate analytical and decision-making skills to identify, formulate, and analyze complex engineering problems reaching substantiated conclusions using concepts of mathematics, science & engineering.
9.	Leadership & Teamwork	Leadership & Teamwork	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To Demonstrate initiativeness and leadership skills working in VUCA world - To display team working skills by engaging with trust, encouraging autonomy & participation and building collaborative culture 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To function effectively as an individual, and as a member or leader in diverse teams, VUCA world and multidisciplinary settings for making the

			<ul style="list-style-type: none"> - To influence the people in networks for making the organization resourceful - To deliver organizational goals and team goals over personal gains 	organization resourceful and achieving organisation goals.
10.	Multicultural Understanding & Global Outlook	Multicultural Understanding & Global Outlook	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To appreciate diversity (caste, ethnicity, gender and marginalization), values and beliefs of multiple cultures in a global perspective - To demonstrate sensibility, adaptability, valuing human diversity in resolving complex management situations - To explore organizational issues from different cultural perspectives and recognising the opportunities in decision making process 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To apply contextual knowledge to assess societal, health, safety, legal, cultural issues and the consequent responsibilities relevant to the professional engineering practice -To appreciate diversity (caste, ethnicity, gender and marginalization), values and beliefs of multiple cultures in a global perspective
11.	Integrity and Ethics	Integrity and Ethics	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To display integrity at work and be responsible global citizens with moral values - To demonstrate ethical practices consistent with the job roles as members of society - To practice the highest standards of ethical behaviour associated with their discipline or profession - To appreciate concerns on environment sustainability 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To demonstrate ethical practices in professional field, display integrity at workplace and be responsible global citizens -To appreciate concerns on environment sustainability
12.	Social & Emotional Skills	Social & Emotional Skills	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To demonstrate adaptability and resilience skills in during uncertain situations - To be self-aware and have the capacity to accept and give constructive feedback - To establish support to others with empathy and build interpersonal relationships 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To acquire social and emotional skills to work effectively with diverse group of people in multi-cultural environment and situations. -To demonstrate adaptability and resilience during uncertain situations
13.	Employability, Enterprise & Entrepreneurship	Employability, Enterprise & Entrepreneurship	<p>Graduates of the University will have the ability</p> <ul style="list-style-type: none"> - To develop knowledge and skills to gain employment opportunities - To improve on functional, technological and behavioural competencies to develop professionalism 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> -To demonstrate knowledge and understanding of the engineering & management principles and use these enterprising skills to bring new business

			<ul style="list-style-type: none"> - To possess enterprising skills to bring new business ideas and start a new venture - To think creatively and innovate new products and services with a social impact - To generate new ideas, design products, adopt disruptive technologies and gain patents & commercialization 	ideas and product of innovative designs with a social impact to start a new venture.
14.	Lifelong Learning	Lifelong Learning	<p>Graduates of the University will have the ability-</p> <ul style="list-style-type: none"> - To demonstrate an attitude for continuous learning and reflection furthering their understanding of the world - To appreciate change and be responsive to the scenarios - To maintain intellectual curiosity and inquiring mind throughout life for gaining knowledge - To explore new ideas and learning opportunities for self-directed learning. 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> - To develop independent thinking and life-long learning in broader context of technological changes. - To explore new ideas and learning opportunities for self-directed learning.
15.	Environment and Sustainability	Environment and Sustainability	<p>The Graduates of the University will have the ability –</p> <ul style="list-style-type: none"> - To analyse and implement the initiative to conserve natural resources and develop sustainable technologies by using knowledge and experience of their discipline. 	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <ul style="list-style-type: none"> - To understand the impact of the professional engineering solutions in societal and environmental contexts and develop sustainable technologies using engineering knowledge.

3.4 Domain Operational Objectives (Resources Required) at Domain/Faculty level:

S. No.	Graduate Attributes	Programme Operational Outcomes
1	GA1, GA3, GA4	DET intends to facilitate academically conducive environment and infrastructure to achieve excellence in teaching, learning and research.
2	GA14, GA15, GA8, GA5	DET will provide ample opportunities to its students to participate in curricular, co-curricular and extra-curricular activities for their holistic development.

3	GA10,	DET will facilitate environment for innovation and research excellence for the intellectual growth of all.
4	GA2	DET will inculcate core values and ethical conduct amongst students, faculty, and staff members.
5	GA12, GA9	DET will encourage cultural diversity and a sense of social and environmental responsibility.
6	GA14, GA2, GA6	DET will provide ample opportunities for international exposure to faculty members, and students.
7	GA11	DET will be involved in continual improvement of processes and systems and aim to attain national and international accreditations and university rankings.
8	GA3	DET will build a strong industry interaction by way of alumni networks and empanelment of expertise from industry.
9	GA10, GA7	DET will facilitate employment opportunities, and also support students to start their own ventures.
10	GA13	DET will facilitate good governance in discharge of responsibilities and execution of policies and programmes.

SECTION IV

INSTITUTION MISSION AND EDUCATIONAL OBJECTIVES

Name of the Institution: Amity Institute of Information Technology (AIIT)

4.1 Mission Statement:

Mission of Institution
To provide education at all levels in all disciplines of Computer Science Applications 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 Computer Science 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 the courage of conviction and action.

4.2 Educational Objectives at Institution Level:

S. No.	Educational Objectives
1	The students shall have the ability to apply knowledge of mathematics, science, computing and technology for research, design and development of novel products and solutions as an individual / member of a team/ leader in diverse teams and as an entrepreneur.
2	The students shall have the ability to examine the impact of computer science and application solutions in societal, health, safety, legal, cultural, and environmental contexts.
3	The student will have the ability to support and practice independent and life-long learning for professional development.
4	The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual / team member / leader in diverse teams.
5	The students will be able to demonstrate professional attitudes, effective communication, and behavioral skills and sustain effective performance in professional/entrepreneurial careers.

4.3 Graduate Attributes and its Indicators at Institute Level:

#	Domain Graduate Attributes	Domain Indicators	Graduate Attributes	Indicators
1.	Engineering & Technology Knowledge & Expertise	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <p>-To apply the knowledge of mathematics, science, engineering fundamentals, computational techniques, and engineering specialization to solve the problems.</p>	IT and Computer Science Knowledge & Expertise	<p>Graduates of the stream of Computer Science Applications will have the ability</p> <p>-To apply the knowledge of mathematics, science, computer science fundamentals, computational techniques, and computer science applications specialization to solve the problems.</p>
2.	Self-Directed and Active Learning	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <p>-To choose self-directed and active learning through strong intellectual engagement in independent work relevant to Engineering & Technology Domain maximizing their potential by utilizing abilities and academic excellence.</p> <p>-To think independently, analytically and creatively through self-directed learning</p>	Self-Directed and Active Learning	<p>Graduates of the stream of Computer Science Applications will have the ability</p> <p>-To choose self-directed and active learning through strong intellectual engagement in independent work relevant to computer science & Technology stream maximizing their potential by utilizing abilities and academic excellence.</p> <p>-To think independently, analytically and creatively through self-directed learning</p>
3.	Research enquiry & Design Thinking	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <p>-To use research-based knowledge and methods including design of experiments, analysis and interpretation of data, and synthesis of the information to arrive at valid conclusions.</p> <p>-To exercise critical judgment and thinking to create new systems / products / services etc.</p>	Research enquiry & Design Thinking	<p>Graduates of the stream of Computer Science Applications will have the ability</p> <p>-To use research-based knowledge and methods including design of experiments, analysis and interpretation of data, and synthesis of the information to arrive at valid conclusions.</p> <p>-To exercise critical judgment and thinking to create new systems / products / services etc.</p>
	ICT and Modern Engineering Tools Usage	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <p>-To create, select, and apply modern engineering techniques, resources, and IT tools for modelling and simulation of engineering problems.</p>	Information & Communication Technology Skills	<p>Graduates of the stream of Computer Science Applications will have the ability</p> <p>-To create, select, and apply modern computer science and applications techniques, resources, and IT tools for</p>

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		-To develop self-paced learning through various tools and techniques of ICT		modelling and simulation of computer science and IT problems. -To develop self-paced learning through various tools and techniques of ICT
	Critical Thinking & Problem-Solving Abilities	Graduates of the Domain of Engineering & Technology will have the ability -To apply critical, creative and evidence-based thinking for creating solutions of engineering problems and to design system components or processes that meet the specified needs with appropriate consideration for the public health, safety, cultural, societal, and environmental considerations	Critical Thinking & Problem-Solving Abilities	Graduates of the stream of Computer Science Applications will have the ability -To apply critical, creative and evidence-based thinking for creating solutions of computer science problems and to design system components or processes that meet the specified needs with appropriate consideration for the public health, safety, cultural, societal, and environmental considerations
	Communication Skills	Graduates of the Domain of Engineering & Technology will have the ability -To communicate effectively on engineering activities with the engineering professionals and society at large, such as, being able to comprehend and write effective reports, make effective presentations, give & receive clear instructions by utilizing various Information Technology tools and skills.	Communication Skills	Graduates of the stream of Computer Science Applications will have the ability -To communicate effectively on engineering activities with the engineering professionals and society at large, such as, being able to comprehend and write effective reports, make effective presentations, give & receive clear instructions by utilizing various Information Technology tools and skills.
	Creativity, Innovation & Reflective Thinking	Graduates of the Domain of Engineering & Technology will have the ability -To demonstrate scientific creativity and reflective thinking to critically evaluate ideas for developing innovative processes and products relevant to industry/societal needs.	Creativity, Innovation & Reflective Thinking	Graduates of the stream of Computer Science Applications will have the ability -To demonstrate scientific creativity and reflective thinking to critically evaluate ideas for developing innovative processes and products relevant to industry/societal needs.
	Analytical & Decision-Making Ability	Graduates of the Domain of Engineering & Technology will have the ability -To demonstrate analytical and decision-making skills to identify, formulate, and analyze complex engineering problems reaching substantiated conclusions using	Analytical & Decision-Making Ability	Graduates of the stream of Computer Science Applications will have the ability -To demonstrate analytical and decision-making skills to identify, formulate, and analyze complex computer science applications problems reaching

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		concepts of mathematics, science & engineering.		substantiated conclusions using concepts of mathematics, science & information technology.
	Leadership & Teamwork	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <p>-To function effectively as an individual, and as a member or leader in diverse teams, VUCA world and multidisciplinary settings for making the organization resourceful and achieving organization goals.</p>	Leadership & Teamwork	<p>Graduates of the stream of Computer Science Applications will have the ability</p> <p>-To function effectively as an individual, and as a member or leader in diverse teams, VUCA world and multidisciplinary settings for making the organization resourceful and achieving organization goals.</p>
	Multicultural Understanding & Global Outlook	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <p>-To apply contextual knowledge to assess societal, health, safety, legal, cultural issues and the consequent responsibilities relevant to the professional engineering practice</p> <p>-To appreciate diversity (caste, ethnicity, gender and marginalization), values and beliefs of multiple cultures in a global perspective</p>	Multicultural Understanding & Global Outlook	<p>Graduates of the stream of Computer Science Applications will have the ability</p> <p>-To apply contextual knowledge to assess societal, health, safety, legal, cultural issues and the consequent responsibilities relevant to the professional engineering practice</p> <p>-To appreciate diversity (caste, ethnicity, gender and marginalization), values and beliefs of multiple cultures in a global perspective</p>
	Integrity and Ethics	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <p>-To demonstrate ethical practices in professional field, display integrity at workplace and be responsible global citizens</p> <p>-To appreciate concerns on environment sustainability</p>	Integrity and Ethics	<p>Graduates of the stream of Computer Science Applications will have the ability</p> <p>-To demonstrate ethical practices in professional field, display integrity at workplace and be responsible global citizens</p> <p>-To appreciate concerns on environment sustainability</p>
	Social & Emotional Skills	<p>Graduates of the Domain of Engineering & Technology will have the ability</p> <p>-To acquire social and emotional skills to work effectively with diverse group of people in multi-cultural environment and situations.</p>	Social & Emotional Skills	<p>Graduates of the stream of Computer Science Applications will have the ability</p> <p>-To acquire social and emotional skills to work effectively with diverse group of</p>

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		-To demonstrate adaptability and resilience during uncertain situations		people in multi-cultural environment and situations. -To demonstrate adaptability and resilience during uncertain situations
	Employability, Enterprise & Entrepreneurship	Graduates of the Domain of Engineering & Technology will have the ability -To demonstrate knowledge and understanding of the engineering & management principles and use these enterprising skills to bring new business ideas and product of innovative designs with a social impact to start a new venture.	Employability, Enterprise & Entrepreneurship	Graduates of the stream of Computer Science Applications will have the ability -To demonstrate knowledge and understanding of the computer science & management principles and use these enterprising skills to bring new business ideas and product of innovative designs with a social impact to start a new venture.
	Lifelong Learning	Graduates of the Domain of Engineering & Technology will have the ability -To develop independent thinking and life-long learning in broader context of technological changes. -To explore new ideas and learning opportunities for self-directed learning.	Information & Communication Technology Skills	Graduates of the stream of Computer Science Applications will have the ability -To develop independent thinking and life-long learning in broader context of technological changes. -To explore new ideas and learning opportunities for self-directed learning.
	Environment and Sustainability	Graduates of the Domain of Engineering & Technology will have the ability -To understand the impact of the professional engineering solutions in societal and environmental contexts and develop sustainable technologies using engineering knowledge.	Environment and Sustainability	Graduates of the stream of Computer Science Applications will have the ability -To understand the impact of the professional engineering solutions in societal and environmental contexts and develop sustainable technologies using computer science knowledge.

4.4 Operational Objectives (Resources Required) at Institution level

S. No.	Graduate Attributes	Programme Operational Outcomes
1.	GA1, GA3, GA4	The faculty will use appropriate teaching learning resources, infrastructure and environment for excellence in teaching, learning, research and professional development of students.

2.	GA14, GA15, GA8, GA5	The faculty and staff will be engaged and make use of Programme Development Programmes to regularly upgrade their knowledge and skills and being excellence in teaching, learning and research
3.	GA10,	The curriculum is contemporary, developed in collaborative consultation with all the stakeholders, benchmarked with global standards and relevant to the industry requirements.
4.	GA2	The students will graduate in timely manner.
5.	GA12, GA9	The department will develop and maintain strong industry interaction, alumni networks and industry expertise.
6.	GA14, GA2, GA6	The students will participate in Co-Curricular and Extra Curricular activities.
7.	GA11	The department will integrate ethics to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programmes
8.	GA3	The department will develop joint research collaborations, develop student and faculty exchange programmes, invite international delegates and speakers for seminars and conferences, for providing opportunities for international exposure for its students and faculty
9.	GA10, GA7	The department will be continuously engaged in developing/ reviewing facilities, services, resources, processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
10.	GA13	The department will establish necessary support systems for the students to facilitate quality placements, pursue higher education, or join family business or start their own ventures.

SECTION V:

PROGRAMME MISSION, PEO's, PLO's and ASSESMENT PLAN FOR EACH PROGRAMME

Bachelor's-Level Programme –

- Three Years Bachelor of Computer Applications (3 Years)**
- Three Years Bachelor of Science and Technology (3 years)**
- Four Years Bachelor of Science and Technology (Honours/Research) (4 Years)**
- Four Years Bachelor of Computer Applications (Honours/Research) (4 Years)**
- Five Years Dual (Bachelors of Computer Applications + Masters of Computer Applications)**

5.1.1 Mission Statement

Programme Mission
“To equip and build competency necessary to work as software professionals in the field related to computing and/or computing applications and to develop strong foundation in mathematical , computing fundamentals, programming, management and problem solving Skills, with ability to communicate effectively with the various stakeholders, have pleasing personality and practice their profession with high regards to ethics, societal needs, diversity, constraints in the workplace, yearning of perfection and imbibe attributes of courage of conviction and action. Our aim is to serve the student by imparting computer education and generating innovative knowledge and skills required to sustain in disruptive technological environment.”

5.1.2 Programme Educational Objectives (PEOs)

S. No	Programme Educational Objectives
1	The students shall have the ability to apply knowledge of mathematics, science, computing and Information Technology for research, design and development of novel products and solutions as an individual/ member of a team/ leader in diverse teams and as an entrepreneur.
2	The students shall have the ability to examine the impact of IT 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.

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.
6	The student will be able to sustain and demonstrates skills in the environment of disruptive technological advancements.

5.1.3. Programme Operational Objectives (OGs)

S.No	Programme Operational Objectives
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 about industry 4.0 and Education 4.0 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 (PLOs):

S. No.	Graduate Attributes	Programme Learning Outcomes
1	IT and Computer Science Knowledge	The student will be able to apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

2	Self-Directed and Active Learning	The student will be able to apply their ability, take personal responsibility and demonstrate perseverance and willingness for self-directed learning to maximize their potential.
3	Research enquiry & Design Thinking	The student will be able to design, analyze, implement, and evaluate a system, process and components to meet desired needs for documenting a project.
4	ICT and Modern Engineering Tools Usage	The student will be able to apply IT Tools and Techniques to solve any Software problems.
5	Critical Thinking & Problem-Solving Abilities	The student will be able to identify, conceptualize, apply problem solving and research skills to identify and solve real life problems.
6	Communication Skills	The student will be able to communicate effectively, both written and oral, with a range of audiences using ICT tools and technology.
7	Creativity, Innovation & Reflective Thinking	The student will be able to demonstrate capacity for independent, conceptual and creative thinking to address intellectual, professional and social challenges.
8	Analytical & Decision-Making Ability	The Student will be able to demonstrate analytical skills, independent thinking, openness to new ideas in assessing and selecting appropriate solution for solving real life problems
9	Leadership & Teamwork	The student will be able to demonstrate leadership skills, ability to work in team for organization development in VUCA world.

10	Multicultural Understanding & Global Outlook	The students will function effectively on teams and also take new initiatives to achieve a common goal in global business environment.
11	Integrity and Ethics	The student will be able to exhibit professional, ethical, legal, security and social issues and responsibilities in the organization.
12	Social & Emotional Skills	The Student will be able to demonstrate adaptability and resilience skills to establish support to others with empathy and build interpersonal relationship.
13	Employability, Enterprise & Entrepreneurship	The student will be able to strategize the business plans, demonstrate the project management knowledge, design and develop plans using management theories in the construction of software systems of varying complexity.
14	Lifelong Learning	The student will be able to understand the requirement of engagement in lifelong learning in dynamic IT domain.
15	Environment and Sustainability	The Students shall be able to understand the impact of the professional IT solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

5.1.5 Programme Operational Outcomes (POOs) :

S. No.	Graduate Attributes	Programme Operational Outcomes
1.	GA1, GA3, GA4	The faculty will use appropriate teaching learning resources, infrastructure and environment for excellence in teaching, learning, research and professional development of students.
2.	GA14, GA15, GA8, GA5	The faculty and staff will be engaged and make use of Programme Development Programmes to regularly upgrade their knowledge and skills and being excellence in teaching, learning and research
3.	GA10,	The curriculum is contemporary, developed in collaborative consultation with all the stakeholders, benchmarked with global standards and relevant to the industry requirements.
4.	GA2	The students will graduate in timely manner.
5.	GA12, GA9	The department will develop and maintain strong industry interaction, alumni networks and industry expertise.
6.	GA14, GA2, GA6	The students will participate in Co-Curricular and Extra Curricular activities.
7.	GA11	The department will integrate ethics to ensure transparency and good governance while discharging various responsibilities to its stakeholders and execution of policies and programmes
8.	GA3	The department will develop joint research collaborations, develop student and faculty exchange programmes, invite international delegates and speakers for seminars and conferences, for providing opportunities for international exposure for its students and faculty
9.	GA10, GA7	The department will be continuously engaged in developing/ reviewing facilities, services, resources, processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.

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10.	GA13	The department will establish necessary support systems for the students to facilitate quality placements, pursue higher education, or join family business or start their own ventures.
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5.1.6 Mapping of Programme Learning Outcomes to Programme Educational Objectives (PEOs):

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):

<div> <div>Programme Educational Objectives (PEOs)</div> <div>Programme Learning Outcome (PLOs)</div> </div>	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO6
BACHELOR'S LEVEL PROGRAMS						
<i>BCA/B.Sc.-IT/BCA(H/R)/B.Sc.(IT)(H/R)/ Dual(BCA+MCA)</i>						
The student will be able to apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.	✓					
The student will be able to apply their ability, take personal responsibility and demonstrate perseverance and willingness for self-directed learning to maximize their potential.	✓			✓		
The student will be able to design, analyze, implement, and evaluate a system, process and components to meet desired needs for documenting a project.	✓					
The student will be able to apply IT Tools and Techniques to solve any Software problems.	✓					

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<div> <div>Programme Educational Objectives (PEOs)</div> <div>Programme Learning Outcome (PLOs)</div> </div>	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO6
The student will be able to identify, conceptualize, apply problem solving and research skills to identify and solve real life problems.	√					
The student will be able to communicate effectively, both written and oral, with a range of audiences using ICT tools and technology.		√				
The student will be able to demonstrate capacity for independent, conceptual and creative thinking to address intellectual, professional and social challenges.		√				
The Student will be able to demonstrate analytical skills, independent thinking, openness to new ideas in assessing and selecting appropriate solution for solving real life problems	√					
The student will be able to demonstrate leadership skills, ability to work in team for organization development in VUCA world.	√					√
The students will function effectively on teams and also take new initiatives to achieve a common goal in global business environment.	√					√
The student will be able to exhibit professional, ethical, legal, security and social issues and responsibilities in the organization.			√			
The Student will be able to demonstrate adaptability and resilience skills to establish support to others with empathy and build interpersonal relationship.				√		√
The student will be able to strategize the business plans, demonstrate the project management knowledge, design and develop plans using management theories in the construction of software systems of varying complexity.	√	√				
The student will be able to understand the requirement of engagement in lifelong learning in dynamic IT domain.					√	
The Students shall be able to understand the impact of the professional IT solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.				√		

Semester Wise Course Curriculum Coherence Matrix (CO-PLO Mapping):

Course Title	PLOs ->	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO1 1	PLO1 2	PLO1 3	PLO1 4	PLO1 5
Problem Solving Using Computer & Python Programming (CSIT143)	CLO 1: Explain Computer Fundamentals & develop the concept of algorithm and algorithmic thinking.	√														
	CLO 2: Apply techniques of problem-solving in real life.	√	√					√	√							
	CLO 3: Use concepts of python programming.	√	√					√	√							
	CLO 4: Demonstrate basic Python decisions and iterations.	√	√	√		√		√	√							
	CLO 5: Create basic Python programs.	√	√		√	√		√	√							
Digital Circuit Design (CSIT144)	CLO 1: Describe digital electronic circuit architectures	√	√					√							√	
	CLO 2: Apply basic techniques for analyzing digital electronic circuits.	√	√		√	√			√						√	
	CLO 3: Categorize logic gates combination.	√	√	√		√		√							√	
	CLO 4: Apply and Evaluate wide range of digital applications, selecting and critically	√	√		√	√			√						√	
	CLO 5: Judge suitable implementation methodologies.	√	√	√		√										
Principles of Operating Systems (CSIT150)	CLO 1: Explain the objectives and functions of modern operating systems.	√												√		
	CLO 2: Explain the logical structure of, and facilities provided by, a modern operating system.	√	√		√									√		
	CLO 3: Analyze the tradeoffs inherent in operating system design.	√	√	√	√	√		√	√					√		
	CLO 4: Categorize different ways of implementing virtual memory.	√	√	√	√	√		√	√					√		

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	CLO 5: Demonstrate practical experience of mechanisms for handling situations of deadlock among processes.	√	√		√	√		√	√					√		
	CLO 6: Demonstrate Linux operating system and able to write shell programs.	√	√		√			√	√					√		
Software Engineering and Software Modeling (CSIT151)	CLO 1: Explain how to determine the requirements and planning of an Information System.	√	√		√					√						
	CLO 2: Extend knowledge about design and development of various types of software projects and Information system tools.	√	√		√							√		√		
	CLO 3: Apply standard coding practice in developing a software project.	√	√	√	√	√		√	√		√			√		
	CLO 4: Apply planning and management techniques on software projects as per industry standards.	√	√	√	√	√		√	√		√			√		
	CLO 5: Examine a variety of topics such as software testing methods, costing techniques.		√		√	√		√	√			√		√		
Fundamentals of Database Management Systems (CSIT246)	CLO 1: Understands the basic concepts of database management systems.	√	√	√		√		√	√					√		
	CLO 2: Design E-R diagrams for real-world applications.	√	√	√		√		√	√					√		
	CLO: 3 Formulate relational algebraic expressions using relational data models and languages.	√	√	√	√	√		√	√							
	CLO 4: Apply normalization transaction properties and concurrency control to design database.	√	√	√		√		√	√					√		

	CLO 5: Analyze the security algorithms for database protection.	√	√	√				√	√					√		
	CLO 6: Describe and study the physical and Logical Database designs, database Modelling, relational, hierarchical and network Models.	√		√										√		
Object Oriented Programming Using Java Language (CSIT247)	CLO 1: Evaluate how to use the concepts of object-oriented programming and define Java features.	√	√		√	√		√	√							
	CLO 2: Understand the concept of use of packages and exception handling in programs.	√	√					√	√							
	CLO 3: Classify various types of constructors, wrapper classes and string functions in programming.	√	√					√	√							
	CLO 4: Describe and apply interfaces and thread in programming.	√														
	CLO 5: Develop applet based applications.	√	√		√	√		√	√							
	CLO 6: Apply DBMS connectivity and server technologies in developing real time applications.	√	√					√	√							
Advanced Web Technology (CSIT248)	CLO 1: Understand the principles of coherent web coding and how to use a digital product.	√	√					√	√							
	CLO 2: Apply the incorporation of valid standards-conformant HTML document involving a variety of element types	√	√					√	√							
	CLO 3: Design web pages using CSS to implement a variety of presentation effects in HTML and XML documents, including explicit positioning of elements	√	√					√	√					√		

	CLO 4: Demonstrate the use of both a debugger and a DOM inspector in order to understand the execution of a client-side program	√	√		√	√		√	√							
	CLO 5: Create a reasonably sophisticated web application using PHP and database connectivity using MySQL.	√	√		√	√		√	√							
	CLO 6: Evaluate the skills and project-based experience needed for entry into web application and development careers	√	√		√	√		√	√							
Android Programming and Web Applications for Mobile Devices (CSIT249)	CLO 1: Understand the concepts of Mobile Application Development Environment and Android SDK	√	√					√	√					√		
	CLO 2: Design android applications using various Views and View Groups.	√	√					√	√					√		
	CLO 3: Identify and evaluate application programming interfaces for the development of database oriented applications.	√	√		√	√		√	√					√		
	CLO 4: Analyse the concepts of Maps, Getting Location Data, Monitoring a Remote Location.	√	√					√	√					√		
	CLO 5: Apply the concepts of Threading, Networking and Security issues in android	√	√					√	√					√		
	CLO 6: Effectively use information and communication technologies, 16 including the engineering graphics, responsible for the mobile web applications development.	√						√	√					√		
Big Data and Data Mining (CSIT363)	CLO 1: Identify Big Data and its Business Implications.	√	√	√	√			√	√					√	√	
	CLO 2: Identify components of Hadoop and Hadoop Eco-System.	√	√	√	√			√	√					√	√	

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	CLO 3: Access and Process Data on Distributed File System. Manage Job Execution in Hadoop Environment.	√	√	√	√											
	CLO 4: Apply Machine Learning Techniques using Big data analytics.	√	√	√	√			√	√					√	√	
Software Testing and Software Quality Assurance (CSIT364)	CLO 1: Apply standard coding practice in developing of software project	√	√					√	√					√		
	CLO 2: Review the principles and procedures of software planning and management in the development of software projects.	√	√		√	√		√	√					√		
	CLO 3: Demonstrate the ability to perform software testing for different types of software applications.	√	√					√	√					√		
	CLO 4: Discuss the fundamentals of Test Design and Test Management.	√	√					√	√					√		
Analysis of Algorithms and Data Structures (CSIT365)	CLO 1: Apply advance Java programming techniques such as encapsulation, dynamic memory allocation, structures to developing solutions for problems.	√	√					√	√							
	CLO 2: Development of stack and queue data structures for solving real world problems.	√	√		√			√	√							
	CLO 3: Describe and implement abstract data types such as linked list, stack, queue and tree by using 'Java' for static and dynamic implementations.	√	√		√			√	√							
	CLO 4: Analyze, and evaluate appropriate abstract data types and algorithms to solve problems.	√	√	√		√		√	√							
	CLO 5: Describe and implement trees by using 'Java' for static and dynamic implementations,	√	√		√			√	√							

	CLO 6: Analyze and implement graph theory and its applications.	√	√	√		√		√	√							
Principles of Computer Graphics	CLO 1: Apply mathematics and logic to develop Computer programs for elementary graphic operations	√	√			√										
	CLO 2: Develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics	√	√			√										
	CLO 3: Develop the competency to understand the concepts related to Computer Vision and Virtual reality	√	√					√	√							
	CLO 4: Apply the logic to develop animation and gaming programs	√	√	√				√	√							
	CLO 5: Describe the logic on 2D Transformations	√	√		√	√		√	√	√	√					
Fundamentals of Data Science and Analytics (CSIT366)	CLO 1: Describe what Data Science is and the skill sets needed to be a data scientist.	√	√			√										
	CLO 2: Describe the Data Science Process and how its components interact.	√	√			√										
	CLO 3: Differentiation of semantic and discourse in terms of NLP.	√	√					√	√							
	CLO 4: Apply basic machine learning algorithms (Linear Regression, k-Nearest Neighbors (k-NN), k-means, Naive Bayes) for predictive modeling.	√	√	√				√	√							
	CLO 5: Create effective visualization of given data (to communicate or persuade).	√	√		√	√		√	√	√	√					
Principles of E-Commerce (CSIT334)	CLO 1: Identify the nature of e-Commerce	√														
	CLO 2: Recognize the business impact and potential of e-Commerce	√	√	√		√		√	√							

	CLO 3: Explain the technologies required to make e-Commerce viable	√	√					√	√							
	CLO 4: Manage the current drivers and inhibitors facing the business world in adopting and using e-Commerce	√	√		√	√		√	√							
	CLO 5: Explain the economic consequences of e-Commerce	√	√					√	√							
	CLO 6: Discuss the trends in e-Commerce and use of Internet for Communication, shopping and social networking	√	√					√	√							
Introduction to Soft Computing Techniques (CSIT368)	CLO 1: Apply basics of Fuzzy logic and neural networks.	√	√	√				√	√		√					
	CLO 2: Evaluate with genetic algorithms and other random search procedures useful while seeking global optimum in self-learning situations	√	√	√	√			√	√		√					
	CLO 3: Develop some familiarity with current research problems and research methods in Soft Computing Techniques.	√	√		√			√	√		√					
	CLO 4: Understand the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience	√	√			√										
Introduction to Data Communication and Computer Networks (CSIT369)	CLO 1: To develop understanding of computer networks and communication basics.	√	√	√		√	√									
	CLO 2: To understand design services at different layers of reference models.	√	√	√	√	√		√	√							
	CLO 3: To learn various error detection/correction techniques, routing protocols, congestion	√	√	√	√			√	√							
	CLO 4: Control algorithms, and connection establishment/release.	√	√	√	√		√									

	CLO 5: To describe and analyze related technical, administrative, and social aspects of networking.	√	√					√	√							
Cloud Computing and Services (CSIT370)	CLO 1: Explain the components of cloud computing showing how business agility in an organization can be created.	√	√		√			√	√							
	CLO 2: Compare and contrast the economic benefits delivered by various cloud models based on application requirements, economic constraints and business requirements.	√	√	√		√		√	√							
	CLO 3: Examine the consistency of services deployed from a cloud architecture	√	√	√		√		√	√							
	CLO 4: Define best practice model to apply when developing and deploying cloud based applications	√	√		√											
Cyber Security and Cyber Laws (CSIT371)	CLO 1: Recognize Cyber Crimes and Information Security Issues.	√	√													
	CLO 2: Explain existing Cyber Laws.	√	√											√		
	CLO 3: Interprets Intellectual Property Rights.	√	√					√	√			√		√		
	CLO 4: Identify standards related to information security	√	√	√	√	√		√	√		√			√		
	CLO 5: Experimental evaluation of industry-based case study	√	√	√				√	√		√	√		√		
IT Project Management and Practices (CSIT372)	CLO 1: Explain project planning, scheduling, and cost management.	√	√					√		√	√		√	√		
	CLO 2: Identify the issues and risks in a realistic project scenario	√										√				
	CLO 3: Apply IT Projects techniques, which is very useful in future as IT Professionals	√	√	√	√			√	√		√	√		√		√
	CLO 4: To develop a professional project proposal	√	√	√	√			√	√		√	√		√		√

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Introduction to IoT (CSIT373)	CLO 1: Analyze in a concise manner how the general Internet as well as Internet of Things works.	√		√		√								√		
	CLO 2: Understand constraints and opportunities of wireless and mobile networks for Internet of Things.	√	√	√		√		√	√	√	√			√	√	√
	CLO 3: Evaluate different protocols and standards associated with IoT.	√	√	√		√		√	√	√	√			√	√	√
	CLO 4: Apply knowledge of IoT to find out different application areas of IoT.	√	√					√	√		√			√	√	√
	CLO 5: Investigate different security and privacy challenges associated with IoT	√	√	√		√		√	√	√	√			√	√	√
Introduction to Artificial Intelligence and Robotics (CSIT374)	CLO 1: Describe human intelligence and AI	√												√		
	CLO 2: Explain how intelligent system works.	√	√	√	√	√								√		
	CLO 3: Understand Prepositional logic	√	√	√	√	√								√		
	CLO 4: Apply Knowledge representation and semantic in Knowledge representation.	√	√	√	√	√								√		
	CLO 5: Develop some familiarity with current research problems and research methods in AI.	√	√	√	√	√								√		
Introduction to Blockchain Technologies (CSIT375)	CLO 1: Define different types of database management system and cryptography system.	√												√		
	CLO 2: Identify the advantages of block chain network and concept of consensus.	√	√					√						√		
	CLO 3: Explain distributed consensus.	√	√					√						√		

	CLO 4: Demonstrate knowledge of block chain challenges and vulnerability issues.	√	√	√	√	√		√	√		√	√	√	√	√	
	CLO 5: Design block chain in different application areas	√	√	√	√	√		√	√		√	√	√	√	√	
Animation and Gaming (CSIT323)	CLO 1: Identify the principle Skills of Animation Artist.	√												√	√	
	CLO 2: Analyze examples of basic principles of animation.	√	√	√		√		√	√					√	√	
	CLO 3: Demonstrate the Frame by frame animation.	√	√					√	√					√	√	
	CLO 4: Demonstrate the Drawing & Modifying Shapes of objects.	√	√		√	√		√	√							
	CLO 5: Create animation on objects.	√	√					√	√							
	CLO 6: Utilize their skills by creating short animation movies	√	√					√	√							
Switched Networks (CSIT242)	CLO 1: Describe basic switching concepts and the operation of Cisco switches	√												√		
	CLO 2: Configure and troubleshoot basic operations of a small switched network	√	√	√		√		√	√					√	√	√
	CLO 3: Describe how VLANs create logically separate networks and how routing occurs between them	√	√					√	√					√	√	
	CLO 4: Configure and troubleshoot VLANs, trunking on Cisco switches, inter-VLAN routing, VTP, and RSTP	√	√		√	√		√	√					√	√	
	CLO 5: Configure and troubleshoot DHCP and DNS operations for IPv4 and IPv6	√	√					√	√		√	√	√	√	√	
	CLO 6: Describe the purpose of the components in a small wireless network	√	√					√	√		√	√	√	√	√	

	CLO 7: Configure and troubleshoot basic operations of a small wireless network	√	√	√		√		√	√					√	√	√
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5.1.7 Programme Learning Assessment for -----For UG Programmes

S.No	Attributes	PLO's	Direct	Target Performance	Indirect	Target Performance
1	IT and Computer Science Knowledge	The student will be able to apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.
			In-house Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59 . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36 -47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50%_Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students should score in less than 50%.
2	Self-Directed and Active Learning	The student will be able to apply their ability, take personal responsibility and demonstrate perseverance and willingness for self-directed learning to maximize their potential.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.
			In-house Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59 . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36 -47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50%_Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students should score in less than 50%.
3	Research enquiry & Design Thinking	The student will be able to design, analyze, implement, and evaluate a system, process and components to meet desired needs for documenting a project.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.

			Seminar/ISR/Major Project Rubrics	<p>Fully Attained (Grade A): 50% students secure marks in the range of 60-68</p> <p>Partly Attained (Grade B): 50% students secure marks in the range of 48-59.</p> <p>Needs Improvement (Grade C): 50% students secure marks in the range of 36-47</p> <p>Not Attained (Grade D): 50% students secure marks <=35.</p>	Feedback from Industry Guide	<p>Fully Attained (Grade A): 50% Students should score in the range of 80-100%.</p> <p>Partly Attained (Grade B): 50% Students should score in the range of 70-79.99%.</p> <p>Needs Improvement (Grade C): 50% Students should score in the range of 50-69.99%.</p> <p>Not Attained (Grade D): 50% Students should score in less than 50%.</p>
4	ICT and Modern Engineering Tools Usage	The student will be able to apply IT Tools and Techniques to solve any Software problems.	Comprehensive Examination	<p>Fully Attained (Grade A): For students secure marks in the range of 75% -100%</p> <p>Partly Attained (Grade B): For students secure marks in the range of 60%-74.99%.</p> <p>Needs Improvement (Grade C): For students secure marks in the range of 40-59.99%.</p> <p>Not Attained (Grade D): For students secure marks less than 40%.</p>	Student Exit Survey	<p>Fully Attained (Grade A): 50% Students give feedback in the range of 80-100%.</p> <p>Partly Attained (Grade B): 50% Students give feedback in the range of 70-79.99%.</p> <p>Needs Improvement (Grade C): 50% Students give feedback in the range of 50-69.99%.</p> <p>Not Attained (Grade D): 50% Students give feedback less than 50%.</p>
			Inhouse Project, Summer Internship, Minor Project, Major Project (Rubrics)	<p>Fully Attained (Grade A): 50% students secure marks in the range of 60-68</p> <p>Partly Attained (Grade B): 50% students secure marks in the range of 48-59.</p> <p>Needs Improvement (Grade C): 50% students secure marks in the range of 36-47</p> <p>Not Attained (Grade D): 50% students secure marks <=35.</p>	Feedback from Industry Guide	<p>Fully Attained (Grade A): 50% Students should score in the range of 80-100%.</p> <p>Partly Attained (Grade B): 50% Students should score in the range of 70-79.99%.</p> <p>Needs Improvement (Grade C): 50% Students should score in the range of 50-69.99%.</p> <p>Not Attained (Grade D): 50% Students should score in less than 50%.</p>
5	Critical Thinking & Problem-Solving Abilities	The student will be able to identify, conceptualize, apply problemsolving and research skills to identify and solve real life problems.	Comprehensive Examination	<p>Fully Attained (Grade A): For students secure marks in the range of 75% -100%</p> <p>Partly Attained (Grade B): For students secure marks in the range of 60%-74.99%.</p> <p>Needs Improvement (Grade C): For students secure marks in the range of 40-59.99%.</p> <p>Not Attained (Grade D): For students secure marks less than 40%.</p>	Student Exit Survey	<p>Fully Attained (Grade A): 50% Students give feedback in the range of 80-100%.</p> <p>Partly Attained (Grade B): 50% Students give feedback in the range of 70-79.99%.</p> <p>Needs Improvement (Grade C): 50% Students give feedback in the range of 50-69.99%.</p> <p>Not Attained (Grade D): 50% Students give feedback less than 50%.</p>
			Inhouse Project, Summer Internship, Minor Project, Major Project (Rubrics)	<p>Fully Attained (Grade A): 50% students secure marks in the range of 60-68</p> <p>Partly Attained (Grade B): 50% students secure marks in the range of 48-59.</p> <p>Needs Improvement (Grade C): 50% students secure marks in the range of 36-47</p> <p>Not Attained (Grade D): 50% students secure marks <=35.</p>	Feedback from Industry Guide	<p>Fully Attained (Grade A): 50% Students should score in the range of 80-100%.</p> <p>Partly Attained (Grade B): 50% Students should score in the range of 70-79.99%.</p> <p>Needs Improvement (Grade C): 50% Students should score in the range of 50-69.99%.</p> <p>Not Attained (Grade D): 50% Students should score in less than 50%.</p>
6	Communication Skills	The student will be able to communicate effectively, both written and oral, with a range of audiences using ICT tools and technology.	Comprehensive Examination	<p>Fully Attained (Grade A): For students secure marks in the range of 75% -100%</p> <p>Partly Attained (Grade B): For students secure marks in the range of 60%-74.99%.</p> <p>Needs Improvement (Grade C): For students secure marks in the range of 40-59.99%.</p> <p>Not Attained (Grade D): For students secure marks less than 40%.</p>	Student Exit Survey	<p>Fully Attained (Grade A): 50% Students give feedback in the range of 80-100%.</p> <p>Partly Attained (Grade B): 50% Students give feedback in the range of 70-79.99%.</p> <p>Needs Improvement (Grade C): 50% Students give feedback in the range of 50-69.99%.</p> <p>Not Attained (Grade D): 50% Students give feedback less than 50%.</p>
			Business Communication	<p>Fully Attained (Grade A): 50% students secure marks in the range of 80%-100%.</p> <p>Partly Attained (Grade B): 50%</p>	Feedback from Industry Guide	<p>Fully Attained (Grade A): 50% Students should score in the range of 80-100%.</p> <p>Partly Attained (Grade B): 50% Students should score in</p>

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				students secure marks in the range of 61% - 79% . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 41% - 60%. <u>Not Attained (Grade D):</u> 50% students secure marks <=40%		the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students should score in less than 50%.
7	Creativity, Innovation & Reflective Thinking	The student will be able to demonstrate capacity for independent, conceptual and creative thinking to address intellectual, professional and social challenges.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.
			Inhouse Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59 . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36 - 47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50%_Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students should score in less than 50%.
8	Analytical & Decision-Making Ability	The Student will be able to demonstrate analytical skills, independent thinking, openness to new ideas in assessing and selecting appropriate solution for solving real life problems	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.
			Inhouse Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59 . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36 - 47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50%_Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students should score in less than 50%.
9	Leadership & Teamwork	The student will be able to demonstrate leadership skills, ability to work in team for organization development in VUCA world.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.
			Leadership & team skills (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 80%-100%. <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 61% - 79% . <u>Needs Improvement (Grade C):</u> 50%	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50%_Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%.

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				students secure marks in the range of 41% - 60%. Not Attained (Grade D): 50% students secure marks <=40%		Not Attained (Grade D): 50%Students should score in less than 50%.
10	Multicultural Understanding & Global Outlook	The students will function effectively on teams and also take new initiatives to achieve a common goal in global business environment.	Comprehensive Examination	Fully Attained (Grade A): For students secure marks in the range of 75% -100% Partly Attained (Grade B): For students secure marks in the range of 60%-74.99%. Needs Improvement (Grade C): For students secure marks in the range of 40-59.99% Not Attained (Grade D): For students secure marks less than 40%.	Student Survey Exit	Fully Attained (Grade A): 50%_Students give feedback in the range of 80-100%. Partly Attained (Grade B): 50%_Students give feedback in the range of 70-79.99%. Needs Improvement (Grade C): 50%Students give feedback in the range of 50-69.99%. Not Attained (Grade D): 50%Students give feedback less than 50%.
			Foreign Language (Rubrics)	Fully Attained (Grade A): 50% students secure marks in the range of 80%-100%. Partly Attained (Grade B): 50% students secure marks in the range of 61% - 79% . Needs Improvement (Grade C): 50% students secure marks in the range of 41% - 60%. Not Attained (Grade D): 50% students secure marks <=40%	Feedback from Industry Guide	Fully Attained (Grade A): 50%_Students should score in the range of 80-100%. Partly Attained (Grade B): 50%_Students should score in the range of 70-79.99%. Needs Improvement (Grade C): 50%Students should score in the range of 50-69.99%. Not Attained (Grade D): 50%Students should score in less than 50%.
11	Integrity and Ethics	The student will be able to exhibit professional, ethical, legal, security and social issues and responsibilities in the organization.	Comprehensive Examination	Fully Attained (Grade A): For students secure marks in the range of 75% -100% Partly Attained (Grade B): For students secure marks in the range of 60%-74.99%. Needs Improvement (Grade C): For students secure marks in the range of 40-59.99%. Not Attained (Grade D): For students secure marks less than 40%.	Student Survey Exit	Fully Attained (Grade A): 50%_Students give feedback in the range of 80-100%. Partly Attained (Grade B): 50%_Students give feedback in the range of 70-79.99%. Needs Improvement (Grade C): 50%Students give feedback in the range of 50-69.99%. Not Attained (Grade D): 50%Students give feedback less than 50%.
			Plagiarism Checking of NTCC Report (Term Paper and Project Reports submitted during Inhouse Training, Summer Internship, Minor Project, Major Project)	Similarity Index of 100% students should be <=15%	Feedback from Industry Guide	Fully Attained (Grade A): 50%_Students should score in the range of 80-100%. Partly Attained (Grade B): 50%_Students should score in the range of 70-79.99%. Needs Improvement (Grade C): 50%Students should score in the range of 50-69.99%. Not Attained (Grade D): 50%Students should score in less than 50%.
12	Social & Emotional Skills	The Student will be able to demonstrate adaptability and resilience skills to establish support to others with empathy and build interpersonal relationship.	Comprehensive Examination	Fully Attained (Grade A): For students secure marks in the range of 75% -100% Partly Attained (Grade B): For students secure marks in the range of 60%-74.99%. Needs Improvement (Grade C): For students secure marks in the range of 40-59.99%. Not Attained (Grade D): For students secure marks less than 40%.	Student Survey Exit	Fully Attained (Grade A): 50%_Students give feedback in the range of 80-100%. Partly Attained (Grade B): 50%_Students give feedback in the range of 70-79.99%. Needs Improvement (Grade C): 50%Students give feedback in the range of 50-69.99%. Not Attained (Grade D): 50%Students give feedback less than 50%.
			Social and Emotional Skills Rubrics	Fully Attained (Grade A): 50% students secure marks in the range of 80%-100%. Partly Attained (Grade B): 50% students secure marks in the range of 61% - 79% . Needs Improvement (Grade C): 50% students secure marks in the range of 41% - 60%. Not Attained (Grade D): 50% students secure marks <=40%	Feedback from Industry Guide	Fully Attained (Grade A): 50%_Students should score in the range of 80-100%. Partly Attained (Grade B): 50%_Students should score in the range of 70-79.99%. Needs Improvement (Grade C): 50%Students should score in the range of 50-69.99%. Not Attained (Grade D): 50%Students should score in less than 50%.

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13	Employability, Enterprise & Entrepreneurship	The student will be able to strategize the business plans, demonstrate the project management knowledge, design and develop plans using management theories in the construction of software systems of varying complexity.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50% Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students give feedback less than 50%.
			Inhouse Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59. <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36-47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.	Alumni Survey	<u>Fully Attained (Grade A):</u> 50% Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students give feedback less than 50%.
14	Lifelong Learning	The student will be able to understand the requirement of engagement in lifelong learning in dynamic IT domain.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50% Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students give feedback less than 50%.
			Inhouse Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59. <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36-47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.	Alumni Survey	<u>Fully Attained (Grade A):</u> 50% Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students give feedback less than 50%.
15	Environment and Sustainability	The Students shall be able to understand the impact of the professional IT solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50% Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students give feedback less than 50%.
			Environmental Science (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 80%-100%. <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 61% - 79% . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 41% - 60%. <u>Not Attained (Grade D):</u> 50% students secure marks <=40%	Alumni Survey	<u>Fully Attained (Grade A):</u> 50% Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students give feedback less than 50%.

**5.2 5.2 MASTER’S-Level Programme : Two Years Masters of Computer Applications
Two Years MSc. (Network Technology & Management)
Two Years MSc. (Information Technology)**

5.2.1 Mission Statement

Programme Mission
"To provide education in all areas of Computer Science & Applications, 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. Our aim is to serve the student by imparting computer education and generating innovative knowledge and skills required to sustain in disruptive technological environment."

5.2.2 Programme Educational Objectives (PEOs)

S.No	Educational Objectives
1.	The students shall have the ability to apply knowledge of mathematics, science, computing and engineering for research, design and development of novel products and solutions as an individual/ member of a team/ leader in diverse teams and as an entrepreneur.
2.	The students shall have the ability to apply research knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusion
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
5.	The student will have the ability to support and practice independent and life-long learning for professional development in the era of disruptive technology and sustain from its impact professionally.
6.	Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers

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5.2.3. Programme Operational Objectives (OG)

S.No	Operational Objectives
1	The Programme of MCA 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 about industry 4.0 and Education 4. 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 (PLOs):

S.No	Graduate Attributes	Programme Learning Outcomes
1	IT and Computer Science Knowledge	The student will be able to apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.
2	Self-Directed and Active Learning	The student will be able to apply their ability, take personal responsibility and demonstrate perseverance and willingness for self-directed learning to maximize their potential.
3	Research enquiry & Design Thinking	The student will be able to use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

4	ICT and Modern Engineering Tools Usage	The students shall be able to create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.
5	Critical Thinking & Problem-Solving Abilities	The student will be able to identify, conceptualize, apply problem solving and research skills to identify and solve real life problems.
6	Communication Skills	Students shall be able to Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.
7	Creativity, Innovation & Reflective Thinking	The student will be able to demonstrate capacity for independent, conceptual and creative thinking to address intellectual, professional and social challenges.
8	Analytical & Decision-Making Ability	The Student will be able to demonstrate analytical skills, independent thinking, openness to new ideas in assessing and selecting appropriate solution for solving real life problems
9	Leadership & Teamwork	Students shall be able to function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.
10	Multicultural Understanding & Global Outlook	Students shall be able to understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.
11	Integrity and Ethics	The student will be able to exhibit professional, ethical, legal, security and social issues and responsibilities in the organization.
12	Social & Emotional Skills	The Student will be able to demonstrate adaptability and resilience skills to establish support to others with empathy and build interpersonal relationship.
13	Employability, Enterprise & Entrepreneurship	The student will be able to strategize the business plans, demonstrate the project management knowledge, design and develop plans using management theories in the construction of software systems of varying complexity.
14	Lifelong Learning	Students shall be able to recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.
15	Environment and Sustainability	The Students shall be able to understand the impact of the professional IT solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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5.2.5 Programme Operational Outcomes (POOs) :

S.No	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 Mapping of Programme Learning Outcomes to Programme Educational Objectives (PEOs):

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):

<div> <div>Programme Educational Objectives (PEOs)</div> <div>Programme Learning Outcome (PLOs)</div> </div>	PEO1	PEO 2	PEO 3	PEO 4	PEO 5	
Programme :						

The student will be able to apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.	✓	✓	✓			
The student will be able to apply their ability, take personal responsibility and demonstrate perseverance and willingness for self-directed learning to maximize their potential.	✓	✓				
The student will be able to use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	✓	✓				
The students shall be able to create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.	✓	✓				
The student will be able to identify, conceptualize, apply problem solving and research skills to identify and solve real life problems.	✓	✓				

Students shall be able to Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.					√	√
The student will be able to demonstrate capacity for independent, conceptual and creative thinking to address intellectual, professional and social challenges.			√			√
The Student will be able to demonstrate analytical skills, independent thinking, openness to new ideas in assessing and selecting appropriate solution for solving real life problems		√	√			
Students shall be able to function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.	√			√		
Students shall be able to understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.			√			
The student will be able to exhibit professional, ethical, legal, security and social issues and responsibilities in the organization.				√		
The Student will be able to demonstrate adaptability and resilience skills to establish support to others with empathy and build interpersonal relationship.						√
The student will be able to strategize the business plans, demonstrate the project management knowledge, design and develop plans using management theories in the construction of software systems of varying complexity.	√	√				
Students shall be able to recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.					√	
The Students shall be able to understand the impact of the professional IT solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.			√			

5.2.7 Direct & Indirect Measures for Programme Learning Assessment for -----PG Level Programme and Dual Degree-----

S.No	Attributes	PLO's	Direct	Target Performance	Indirect	Target Performance
1	IT and Computer Science Knowledge	The student will be able to apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50% Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.

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			In-house Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59 . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36 -47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50% Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students should score in less than 50%.
2	Self-Directed and Active Learning	The student will be able to apply their ability, take personal responsibility and demonstrate perseverance and willingness for self-directed learning to maximize their potential.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50% Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students give feedback less than 50%.
			In-house Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59 . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36 -47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50% Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students should score in less than 50%.
3	Research enquiry & Design Thinking	The student will be able to design, analyze, implement, and evaluate a system, process and components to meet desired needs for documenting a project.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50% Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students give feedback less than 50%.
			Seminar/ISR/Major Project Rubrics	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59 . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36 -47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50% Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students should score in less than 50%.
4	ICT and Modern Engineering Tools Usage	The student will be able to apply IT Tools and Techniques to solve any Software problems.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50% Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50% Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50% Students give feedback less than 50%.
			Inhouse Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50%	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50% Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50% Students should score in

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				students secure marks in the range of 48-59 . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36 - 47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.		the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students should score in less than 50%.
5	Critical Thinking & Problem-Solving Abilities	The student will be able to identify, conceptualize, apply problemsolving and research skills to identify and solve real life problems.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.
			Inhouse Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59 . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36 - 47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50%_Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students should score in less than 50%.
6	Communication Skills	The student will be able to communicate effectively, both written and oral, with a range of audiences using ICT tools and technology.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.
			Business Communication	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 80%-100%. <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 61% - 79% . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 41% - 60%. <u>Not Attained (Grade D):</u> 50% students secure marks <=40%	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50%_Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students should score in less than 50%.
7	Creativity, Innovation & Reflective Thinking	The student will be able to demonstrate capacity for independent, conceptual and creative thinking to address intellectual, professional and social challenges.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.
			Inhouse Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59 . <u>Needs Improvement (Grade C):</u> 50%	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50%_Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%.

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				students secure marks in the range of 36 - 47 Not Attained (Grade D): 50% students secure marks <=35.		Not Attained (Grade D): 50%Students should score in less than 50%.
8	Analytical & Decision-Making Ability	The Student will be able to demonstrate analytical skills, independent thinking, openness to new ideas in assessing and selecting appropriate solution for solving real life problems	Comprehensive Examination	Fully Attained (Grade A): For students secure marks in the range of 75% -100% Partly Attained (Grade B): For students secure marks in the range of 60%-74.99%. Needs Improvement (Grade C): For students secure marks in the range of 40-59.99%. Not Attained (Grade D): For students secure marks less than 40%.	Student Exit Survey	Fully Attained (Grade A): 50%_Students give feedback in the range of 80-100%. Partly Attained (Grade B): 50%_Students give feedback in the range of 70-79.99%. Needs Improvement (Grade C): 50%Students give feedback in the range of 50-69.99%. Not Attained (Grade D): 50%Students give feedback less than 50%.
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9	Leadership & Teamwork	The student will be able to demonstrate leadership skills, ability to work in team for organization development in VUCA world.	Comprehensive Examination	Fully Attained (Grade A): For students secure marks in the range of 75% -100% Partly Attained (Grade B): For students secure marks in the range of 60%-74.99%. Needs Improvement (Grade C): For students secure marks in the range of 40-59.99%. Not Attained (Grade D): For students secure marks less than 40%.	Student Exit Survey	Fully Attained (Grade A): 50%_Students give feedback in the range of 80-100%. Partly Attained (Grade B): 50%_Students give feedback in the range of 70-79.99%. Needs Improvement (Grade C): 50%Students give feedback in the range of 50-69.99%. Not Attained (Grade D): 50%Students give feedback less than 50%.
			Leadership & team skills (Rubrics)	Fully Attained (Grade A): 50% students secure marks in the range of 80%-100%. Partly Attained (Grade B): 50% students secure marks in the range of 61% - 79% . Needs Improvement (Grade C): 50% students secure marks in the range of 41% - 60%. Not Attained (Grade D): 50% students secure marks <=40%	Feedback from Industry Guide	Fully Attained (Grade A): 50%_Students should score in the range of 80-100%. Partly Attained (Grade B): 50%_Students should score in the range of 70-79.99%. Needs Improvement (Grade C): 50%Students should score in the range of 50-69.99%. Not Attained (Grade D): 50%Students should score in less than 50%.
10	Multicultural Understanding & Global Outlook	The students will function effectively on teams and also take new initiatives to achieve a common goal in global business environment.	Comprehensive Examination	Fully Attained (Grade A): For students secure marks in the range of 75% -100% Partly Attained (Grade B): For students secure marks in the range of 60%-74.99%. Needs Improvement (Grade C): For students secure marks in the range of 40-59.99%. Not Attained (Grade D): For students secure marks less than 40%.	Student Exit Survey	Fully Attained (Grade A): 50%_Students give feedback in the range of 80-100%. Partly Attained (Grade B): 50%_Students give feedback in the range of 70-79.99%. Needs Improvement (Grade C): 50%Students give feedback in the range of 50-69.99%. Not Attained (Grade D): 50%Students give feedback less than 50%.
			Foreign Language (Rubrics)	Fully Attained (Grade A): 50% students secure marks in the range of 80%-100%. Partly Attained (Grade B): 50% students secure marks in the range of 61% - 79% . Needs Improvement (Grade C): 50% students secure marks in the range of 41% - 60%. Not Attained (Grade D): 50% students	Feedback from Industry Guide	Fully Attained (Grade A): 50%_Students should score in the range of 80-100%. Partly Attained (Grade B): 50%_Students should score in the range of 70-79.99%. Needs Improvement (Grade C): 50%Students should score in the range of 50-69.99%. Not Attained (Grade D): 50%Students should score in less than 50%.

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				secure marks <=40%		
1 1	Integrity and Ethics	The student will be able to exhibit professional, ethical, legal, security and social issues and responsibilities in the organization.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.
			Plagiarism Checking of NTCC Report (Term Paper and Project Reports submitted during Inhouse Training, Summer Internship, Minor Project, Major Project)	Similarity Index of 100% students should be <=15%	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50%_Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students should score in less than 50%.
12	Social & Emotional Skills	The Student will be able to demonstrate adaptability and resilience skills to establish support to others with empathy and build interpersonal relationship.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.
			Social and Emotional Skills Rubrics	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 80%-100%. <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 61% - 79% . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 41% - 60%. <u>Not Attained (Grade D):</u> 50% students secure marks <=40%	Feedback from Industry Guide	<u>Fully Attained (Grade A):</u> 50%_Students should score in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students should score in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students should score in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students should score in less than 50%.
13	Employability, Enterprise & Entrepreneurship	The student will be able to strategize the business plans, demonstrate the project management knowledge, design and develop plans using management theories in the construction of software systems of varying complexity.	Comprehensive Examination	<u>Fully Attained (Grade A):</u> For students secure marks in the range of 75% -100% <u>Partly Attained (Grade B):</u> For students secure marks in the range of 60%-74.99%. <u>Needs Improvement (Grade C):</u> For students secure marks in the range of 40-59.99%. <u>Not Attained (Grade D):</u> For students secure marks less than 40%.	Student Exit Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.
			Inhouse Project, Summer Internship, Minor Project, Major Project (Rubrics)	<u>Fully Attained (Grade A):</u> 50% students secure marks in the range of 60-68 <u>Partly Attained (Grade B):</u> 50% students secure marks in the range of 48-59 . <u>Needs Improvement (Grade C):</u> 50% students secure marks in the range of 36 - 47 <u>Not Attained (Grade D):</u> 50% students secure marks <=35.	Alumni Survey	<u>Fully Attained (Grade A):</u> 50%_Students give feedback in the range of 80-100%. <u>Partly Attained (Grade B):</u> 50%_Students give feedback in the range of 70-79.99%. <u>Needs Improvement (Grade C):</u> 50%Students give feedback in the range of 50-69.99%. <u>Not Attained (Grade D):</u> 50%Students give feedback less than 50%.

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14	Lifelong Learning	The student will be able to understand the requirement of engagement in lifelong learning in dynamic IT domain.	Comprehensive Examination	Fully Attained (Grade A): For students secure marks in the range of 75% -100% Partly Attained (Grade B): For students secure marks in the range of 60%-74.99%. Needs Improvement (Grade C): For students secure marks in the range of 40-59.99%. Not Attained (Grade D): For students secure marks less than 40%.	Student Exit Survey	Fully Attained (Grade A): 50% Students give feedback in the range of 80-100%. Partly Attained (Grade B): 50% Students give feedback in the range of 70-79.99%. Needs Improvement (Grade C): 50% Students give feedback in the range of 50-69.99%. Not Attained (Grade D): 50% Students give feedback less than 50%.
			Inhouse Project, Summer Internship, Minor Project, Major Project (Rubrics)	Fully Attained (Grade A): 50% students secure marks in the range of 60-68 Partly Attained (Grade B): 50% students secure marks in the range of 48-59 . Needs Improvement (Grade C): 50% students secure marks in the range of 36 - 47 Not Attained (Grade D): 50% students secure marks <=35.	Alumni Survey	Fully Attained (Grade A): 50% Students give feedback in the range of 80-100%. Partly Attained (Grade B): 50% Students give feedback in the range of 70-79.99%. Needs Improvement (Grade C): 50% Students give feedback in the range of 50-69.99%. Not Attained (Grade D): 50% Students give feedback less than 50%.
15	Environment and Sustainability	The Students shall be able to understand the impact of the professional IT solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	Comprehensive Examination	Fully Attained (Grade A): For students secure marks in the range of 75% -100% Partly Attained (Grade B): For students secure marks in the range of 60%-74.99%. Needs Improvement (Grade C): For students secure marks in the range of 40-59.99%. Not Attained (Grade D): For students secure marks less than 40%.	Student Exit Survey	Fully Attained (Grade A): 50% Students give feedback in the range of 80-100%. Partly Attained (Grade B): 50% Students give feedback in the range of 70-79.99%. Needs Improvement (Grade C): 50% Students give feedback in the range of 50-69.99%. Not Attained (Grade D): 50% Students give feedback less than 50%.
			Environmental Science (Rubrics)	Fully Attained (Grade A): 50% students secure marks in the range of 80%-100%. Partly Attained (Grade B): 50% students secure marks in the range of 61% - 79% . Needs Improvement (Grade C): 50% students secure marks in the range of 41% - 60%. Not Attained (Grade D): 50% students secure marks <=40%	Alumni Survey	Fully Attained (Grade A): 50% Students give feedback in the range of 80-100%. Partly Attained (Grade B): 50% Students give feedback in the range of 70-79.99%. Needs Improvement (Grade C): 50% Students give feedback in the range of 50-69.99%. Not Attained (Grade D): 50% Students give feedback less than 50%.

5.2.8 Assessment of Program Learning Outcomes through Comprehensive Examination

Course Title	PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PLO13	PLO14	PLO15
Computer Graphics and Animation	CLO 1: Understand fundamental terms of computer graphics	√	√					√							√	
	CLO 2: Evaluate concepts of computer graphics such as geometrical transformations, illumination models,	√	√		√	√			√						√	

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	removal of hidden surfaces and rendering															
	CLO 3: Analyze the ideas in some fundamental algorithms for computer graphics and to some extent be able to compare and evaluate them understand some of the modeling software tools.	√	√	√		√		√							√	
	CLO 4: Remember the software tools /API to build simple 3D objects.	√	√		√	√			√						√	
Graph Theory and Combinatorics	CLO 1: Understand and explain the basic concepts of graph theory.	√												√		
	CLO 2: Apply the basic concepts of mathematical logic.	√	√		√									√		
	CLO 3: Analyze the basic concepts of mathematical logic	√	√	√	√	√		√	√					√		
	CLO 4: Evaluate some real time problems using concepts of graph theory	√	√	√	√	√		√	√					√		
Core Java	CLO 1: Understand fundamentals of object-oriented programming in Java	√	√		√					√						
	CLO 2: Write a computer program to solve specified problems.	√	√		√							√		√		
	CLO 3: Use the Java SDK environment to create, debug and run simple Java programs	√	√	√	√	√		√	√		√			√		
	CLO 4: Write a computer program to solve specified problems	√	√	√	√	√		√	√		√			√		
ADVANCED DATABASE	CLO 1: Identify advance database	√	√	√		√		√	√					√		

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MANAGEMENT SYSTEMS	concepts and database models.															
	CLO 2: Apply and analyze various terms related to transaction management in centralized, parallel and distributed database.	√	√	√		√		√	√					√		
	CLO 3: Produce data modeling and database development process for object –oriented DBMS.	√	√	√	√	√		√	√							
	CLO 4: Analyze and Implement the concept of object-relational database in development of various real time software.	√	√	√		√		√	√					√		
	CLO 5: Explain the issues related to multimedia and mobile database performance.	√	√	√				√	√					√		
ADVANCED SOFTWARE ENGINEERING PRINCIPLES	CLO 1: Analyze the software life cycle models;	√	√		√	√		√	√							
	CLO 2: Identify the importance of the software development process;	√	√					√	√							
	CLO 3: Analyze the importance of CASE tools;	√	√					√	√							
	CLO 4: Design and develop correct and robust software products using advanced software engineering techniques;	√														
	CLO 5: Able to understand business requirements pertaining to software development.	√	√		√	√		√	√							
Introduction to Data Analytics	CLO 1: Describe what Data Science is and the skill sets needed to be a data scientist.	√	√					√	√							

	CLO 2: Explain in basic terms what Statistical Inference means. Identify probability distributions commonly used as foundations for statistical modeling. Fit a model to data.	√	√					√	√							
	CLO 3: Explain the significance of exploratory data analysis (EDA) in data science.	√	√					√	√					√		
	CLO 4: Describe the Data Science Process and how its components interact.	√	√		√	√		√	√							
	CLO 5: Apply basic machine learning algorithms (Linear Regression, k-Nearest Neighbors (k-NN), k-means, Naive Bayes) for predictive modeling.	√	√		√	√		√	√							
Routing and Switching Essentials	CLO 1: <u>Plan</u> and effectively manage any LAN network using Switching.	√	√					√	√					√		
	CLO 2: <u>Deploy</u> and effectively manage the LAN.	√	√					√	√					√		
	CLO 3: <u>Analyze</u> how a router learns about remote networks and determines the best path to those networks.	√	√		√	√		√	√					√		
	CLO 4: <u>Describe</u> the relationship between router interfaces, directly connected networks and the routing table.	√	√					√	√					√		
	CLO 5: <u>Categorize</u> various dynamic routing protocols.	√	√					√	√					√		
	CLO 6: <u>Analyze</u> DHCP protocols and	√						√	√					√		

	Network Address Translation															
Statistics using R-Programming	CLO 1: Learned or remember all the tools, packages, and functions of R which are used to solve the statistics	√	√	√	√			√	√					√	√	
	CLO 2: Understand the method of solving statistical problems using R tools and packages	√	√	√	√			√	√					√	√	
	CLO 3: Apply the tools and functions of R to solve real world problems	√	√	√	√											
	CLO 4: Evaluate various tools which they study in R for statistics															
	CLO 5: Create new statistical model for solving real world problem using data sets	√	√	√	√			√	√					√	√	
Network Security and Cryptography	CLO1: Analyze multiple operating systems, systems software, network services and security. Evaluate and compare systems software and emerging technologies	√	√					√	√					√		
	CLO2: Evaluate solutions for networking and security problems, balancing business concerns, technical issues, and security.	√	√		√	√		√	√					√		
	CLO 3: Creating concepts and theories of networking and apply them to various situations, classifying networks, analyzing performance, and implementing new technologies	√	√					√	√					√		

SCALING NETWORKS	CLO 1: Understand, configure and troubleshoot enhanced switching technologies such as VLANs, Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Plus Protocol (PVST+), and Ether Channel	√	√					√	√							
	CLO 2: Understand, configure, and troubleshoot first hop redundancy protocols (HSRP) in a switched network	√	√		√			√	√							
	CLO 3: Understand, configure, and troubleshoot wireless routers and wireless clients	√	√		√			√	√							
	CLO4: Configure and troubleshoot routers in a complex √ routed IPv4 or IPv6 network using single-area OSPF, multi area OSPF, and Enhanced Interior Gateway Routing Protocol (EIGRP)	√	√	√		√		√	√							
	CLO 5: Manage Cisco IOS Software licensing and configuration files	√	√		√			√	√							
Research Methodologies	CLO 1: Recognize the various steps involved in research.	√	√			√										
	CLO 2: Collect data from samples, Examine and Analyze the data.	√	√			√										
	CLO 3: Develop models for problems.	√	√					√	√							
	CLO 4: Explain the entire process in the form of a report.	√	√	√				√	√							
Artificial Intelligence and Robotics	CLO 1: Analyze human intelligence and AI	√	√			√										

	CLO 2: Understand how intelligent system works.	√	√			√										
	CLO 3: apply Knowledge representation and semantic in Knowledge representation.	√	√					√	√							
	CLO 4: Develop some familiarity with current research problems and research methods in AI.	√	√	√				√	√							
	CLO5: Demonstrate and Illustrate about functionalities of Robots and Robotics.	√	√		√	√		√	√	√	√					
Foundation of Cloud IoT Edge ML	CLO1: Identify relevant technologies (IoT, ML and Cloud) for various emerging computing paradigms of Edge Computing.	√														
	CLO2: in-depth understanding of terminologies and the core concepts behind Cloud-IoT-Edge problems, applications, systems and the techniques, that underlie today's cutting-edge technologies.	√	√	√		√		√	√							
	CLO3 Apply to some of the start-of-the-art IoT and wireless networks, edge and virtualization technologies, recent trends in computer hardware for artificial intelligence, spatial localization and detection, tensor processing unit for fast and affordable artificial intelligence (AI).	√	√					√	√							
	CLO4: Understand the concepts and techniques used in	√	√		√	√		√	√							

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	Cloud, IOT, Edge Computing.															
Advanced Computer Networks	CLO1: understand concept of high performance computing	√	√	√				√	√		√					
	CLO2: Apply concept of software defined network	√	√	√	√			√	√		√					
	CLO3 Understand network function virtualization	√	√		√			√	√		√					
	CLO4: Understand the concepts of Content Naming, Routing and Caching, Security in Named Data Networking	√	√			√										
Artificial Intelligence: Knowledge Representation And Reasoning	CLO1: Explore a variety of representation formalisms and the associated algorithms for reasoning	√	√	√		√	√									
	CLO2: Understand simple language of propositions, and first order logic	√	√	√	√	√		√	√							
	CLO3: Apply representations for reasoning about action, change, situations, and about other agents in incomplete information situations.	√	√	√	√			√	√							
	CLO4: Generated Rule Based system	√	√	√	√		√									
Privacy and Security in Online Social Media	CLO1: Understand structure and working of social media	√	√		√			√	√							
	CLO2: Understand concept of privacy disclosure in social media	√	√	√		√		√	√							
	CLO3 Understand fraudulent entity on social media	√	√	√		√		√	√							
	CLO4: Apply concept in research paper	√	√		√											

Course Title	PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PLO13	PLO14	PLO15
WIRELESS COMMUNICATIONS (PRINCIPLES AND PRACTICES)	CLO 1: Explain the concept of the principles, algorithms and technologies used in transmission information in wireless mobile channels. Apply the concept of hand-off of voice calls between the cells	√	√					√							√	
	CLO 2: Plan and design Cellular Networks	√	√		√	√			√						√	
	CLO 3: Derive expressions for error performance and capacity for various transmission schemes	√	√	√		√		√							√	
	CLO 4: Analyze the performance of various technologies such as GSM, GPRS, CDMA, W-CDMA, DECT, Satellite Based Cellular Communication, UMTS, LMDS, and MMDS.	√	√	√		√		√							√	
	CLO 5: Apply research findings on increasing the channel efficiency	√	√	√		√		√							√	
Computer Fundamentals and C Programming	CLO 1: Apply the fundamental of programming language such as variables, values, types, assignment, control flow, handling files.	√												√		
	CLO 2: Create program with C programming	√	√		√									√		
	CLO 3: Analyze the principles of an imperative, functional, logic oriented programming language.	√	√	√	√	√		√	√					√		
	CLO 4: Evaluate programming languages critically and in a scientific manner.	√	√	√	√	√		√	√					√		
DATA COMMUNICATION AND NETWORKING FUNDAMENTALS	CLO 1: Recognize and Describe about the working of Computer Networks.	√	√		√					√						
	CLO 2: Illustrate reference models with layers, protocols and interfaces.	√	√		√							√		√		
	CLO 3: Summarize functionalities of different Layers.	√	√	√	√	√		√	√		√			√		

	CLO 4: Combine and distinguish functionalities of different Layers. Model the LAN and WAN configuration using different media.	√	√		√					√						
	CLO 5: Examine problems of a computer networks.	√	√		√					√						
Computer Organization Architecture and Assembly Language	CLO 1: Explain the basic knowledge of the design of digital logic circuits and apply to computer organization.	√	√	√		√		√	√					√		
	CLO2: Understand the digital components like flip flops, registers, counters.	√	√	√		√		√	√					√		
	CLO 3: Describe the functional units of the processor such as the register file and arithmetic-logical unit.	√	√	√	√	√		√	√							
	CLO4: Analyze the representation of data, addressing modes, instructions sets and the computer arithmetic.	√	√	√		√		√	√					√		
	CLO 5: Apply the concepts of the basic parallel, pipelined, superscalar, and RISC/CISC architectures.	√	√	√				√	√					√		
Research Methodologies	CLO1: Recognize the various steps involved in research.	√	√		√	√		√	√							
	CLO2: Collect data from samples, Examine and Analyze the data.	√	√					√	√							
	CLO3: Develop models for problems.	√	√					√	√							
	CLO4: Explain the entire process in the form of a report.	√														
Operating System - Theories and Practices	CLO 1: explain the objectives and functions of modern operating systems.	√	√					√	√							
	CLO 2: describe the logical structure of, and facilities provided by, a modern operating system.	√	√					√	√							
	CLO 3: analyze the tradeoffs inherent in operating system design.	√	√					√	√					√		
	CLO 4: differentiate between the concepts of processes, threads and multithreading.	√	√		√	√		√	√							
	CLO5:demonstrate practical experience of mechanisms for handling situations of deadlock among processes.	√	√		√	√		√	√							

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RELATIONAL DATABASE MANAGEMENT SYSTEM	CLO1:After completion of this course, student will be able to:	√	√					√	√					√		
	CLO2: Identify the basic goals and functions of databases and their applications.	√	√					√	√					√		
	CLO3:Illustrate the concept of normalization to develop database for solving real life problem.	√	√		√	√		√	√					√		
	CLO4:Analyze the design of Database using concept of data modeling and normalization.	√	√					√	√					√		
	CLO5:Apply SQL to develop software application based on database management project.	√	√					√	√					√		
	CLO6:Formulate the concept of database security, transaction management and data recovery	√						√	√					√		
Data Structures Using C Language	CLO1: Explore how to use the concepts of data structures and its execution in actual environment.	√	√	√	√			√	√					√	√	
	CLO2: apply advance C programming techniques such as pointers, dynamic memory allocation, structures to developing solutions for particular problems.	√	√	√	√			√	√					√	√	
	CLO3: Design and implement abstract data types such as linked list, stack, queue and tree by using for static and dynamic implementations.	√	√	√	√											
	CLO4: Analyze, and evaluate appropriate abstract data types and algorithms to solve problems.															
Computer Graphics and Animation	CLO1: Understand fundamental terms of computer graphics	√	√					√	√					√		
	CLO2:evaluate concepts of computer graphics such as geometrical transformations, illumination models, removal of hidden surfaces and rendering analyze the ideas in some fundamental algorithms for computer graphics and to some extent be able to compare and evaluate them	√	√		√	√		√	√					√		
	CLO3: understand some of the modeling software tools.	√	√		√					√						

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	CLO4: remember the software tools /API to build simple 3D objects.	√	√		√					√						
Internet of Everything	CLO1:Describe the Evolution of IOE and its benefits	√	√					√	√							
	CLO2:Explain the process of interconnection of people, process and data.	√	√		√			√	√							
	CLO3:Implementation of IOE and connection of IOE	√	√		√			√	√							
	CLO4:Describe the process of transition to the IOE	√	√	√		√		√	√							
	CLO5: Demonstration of different types of IOE Model.															
Core Java	CLO1:Understand fundamentals of object-oriented programming in Java	√	√			√										
	CLO2: Write a computer program to solve specified problems.	√	√			√										
	CLO 3: Use the Java SDK environment to create, debug and run simple Java programs	√	√					√	√							
	CLO 4:Write a computer program to solve specified problems	√	√	√				√	√							
CLOUD INFRASTRUCTURE AND SERVICES	CLO 1: <u>Analyze</u> the components of cloud computing showing how business agility in an organization can be created.	√	√			√										
	CLO 2: <u>Analyze</u> the local and global impact of Information Technology on individuals, organizations and society .	√	√			√										
	CLO3: <u>Evaluate</u> the development of web services from cloud architecture	√	√					√	√							
	CLO4: <u>Critique</u> the consistency of services deployed from a cloud architecture	√	√	√				√	√							
	CLO 5: <u>Compare and contrast</u> the economic benefits delivered by various cloud models based on application requirements, economic constraints and business requirements.	√	√		√	√		√	√	√	√					

SECTION VI:
OPERATIONAL OUTCOMES & OPERATIONAL ASSESSMENT PLAN
For Domain Engineering & Technology

6. Operational Assessment

6.1 Operational Outcomes

S. No.	Operational Outcomes
1.	DET 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 DET will graduate in timely manner.
4.	DET shall maintain appropriate academic facilities and technological Resources for teaching and learning.
5.	The students of DET 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 DET will integrate ethics and values in teaching, theory and practice, develop and retain excellent students, faculty and staff.
8.	DET will facilitate joint research collaborations; invite international delegates and speakers for seminars and conferences and various other opportunities for global exposure.
9.	DET will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies.
10.	DET 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.

6.2 Operational Outcome Assessment Plan

S. No.	Operational Objectives	Operational Outcomes	Assessment Measures/Methods for Operational Outcomes	Performance Objectives (Targets/Criteria)
1	DET intends to facilitate academically conducive environment and infrastructure to achieve excellence in teaching, learning and research.	<ul style="list-style-type: none"> DET will encourage faculty to use appropriate methodology and pedagogical tools for teaching, learning and development of students. The students of DET will graduate in timely manner. 	<ul style="list-style-type: none"> 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) 	<ul style="list-style-type: none"> All faculty shall have a minimum criterion 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	DET will provide ample opportunities to its students to participate in curricular, co-curricular and extracurricular activities for their holistic development.	<ul style="list-style-type: none"> The students of DET will participate in Co-Curricular and Extra Curricular activities 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Every student shall be a part of at least one Club or Committee or inter institutional competition.
3	DET will facilitate environment for innovation and research excellence for the intellectual growth of faculty.	<ul style="list-style-type: none"> DET shall maintain appropriate academic facilities and technological Resources for teaching and learning. 	<p>Faculty data about Research work and other Scholar activities such as:</p> <ul style="list-style-type: none"> Scholarship of teaching; published and unpublished articles, manuscripts, books, curriculum 	

			<p>review and evaluation of teaching material.</p> <ul style="list-style-type: none"> • 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	DET will inculcate core values and ethical conduct amongst students, faculty and staff.	<ul style="list-style-type: none"> • The DET will integrate ethics and values in teaching, theory and practice, develop and retain excellent students, faculty and staff. 	<ul style="list-style-type: none"> • Attrition Rate • Courses embedded in curriculum such as Behavioral Science Courses, Human Values and Community Outreach, etc. • Plagiarism check. • Feedback system. 	<ul style="list-style-type: none"> • 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	DET will encourage cultural diversity and a sense of social and environmental responsibility.	<ul style="list-style-type: none"> • DET will facilitate joint research collaborations; invite international delegates and speakers for seminars and conferences 	<ul style="list-style-type: none"> • List of community/ social sector projects/ activities/ engagements. • Organizing Cultural programmes. • Day of Belongingness. 	<ul style="list-style-type: none"> • Atleast 80% faculty and students should be engaged in organizing/ participating the various events and activities

		and various other opportunities for global exposure.	<ul style="list-style-type: none"> • Celebration of festivals for culturally diverse group of students. 	
6	DET will provide ample opportunities for international exposure to faculty and students.		<ul style="list-style-type: none"> • Study Abroad Programme • Exchange Programs for students. • Conferences/ Seminars organized by national and international speakers and delegates. • Collaborative Research. 	<ul style="list-style-type: none"> • 100% students and faculty of DET shall be offered an opportunity for international exposure through various programs designed for the purpose.
7	DET will be involved in continual improvement of processes and systems and aim to attain national and international accreditations and university rankings.	<ul style="list-style-type: none"> • The curriculum is contemporary, developed in collaborative consultation with all the stakeholders, benchmarked with global standards and relevant to the industry requirements • DET will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies 	<ul style="list-style-type: none"> • Ranking in national and international ranking agencies. • Accreditation at institutions and programme levels. 	<ul style="list-style-type: none"> • Continuous review and enhancement of all the required systems and processes to upgrade/ maintain high standards
8	DET will build a strong industry interaction by way of alumni networks and empanelment of expertise from industry.	<ul style="list-style-type: none"> • DET will develop and maintain strong relationship with corporate and support all the students for quality placements or 		

9	DET will facilitate employment opportunities and also support students to start their own ventures.	join family business or start their own venture.		
10	DET will facilitate good governance in discharge of responsibilities and execution of policies and programs.	<ul style="list-style-type: none"> • DET will be continuously engaged in developing/ reviewing processes, policies and systems to achieve prestigious accreditations from various national, international bodies and ranking bodies. 		

SECTION VII:

7.1 Linkage of Outcomes Assessment with Strategic Planning

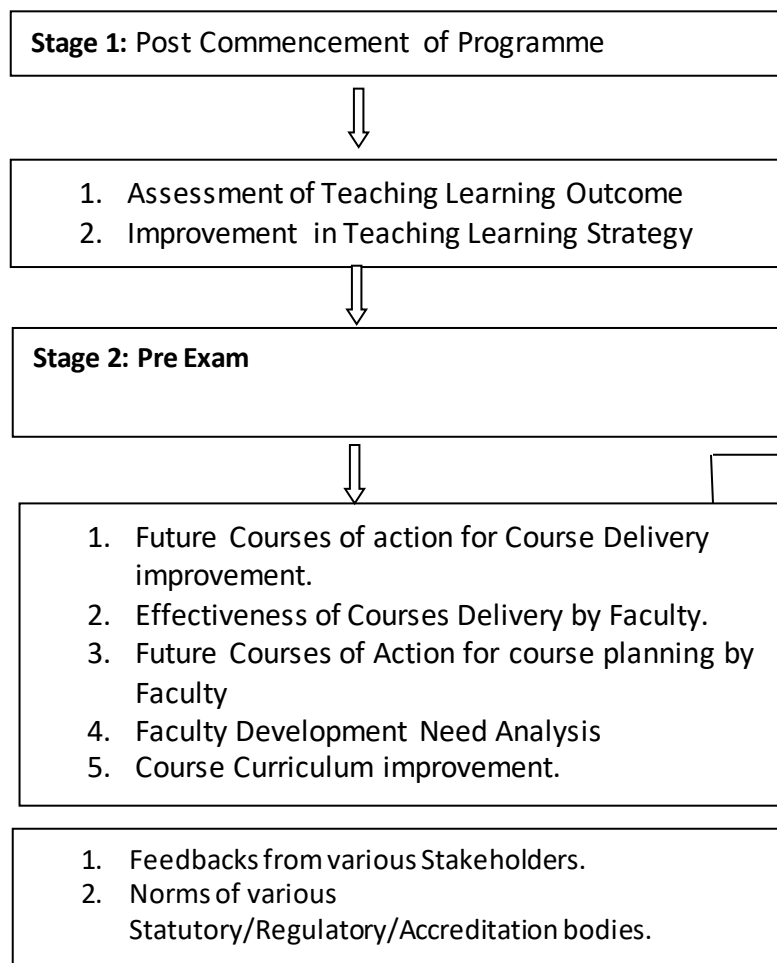
Faculty of Engineering and Technology

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

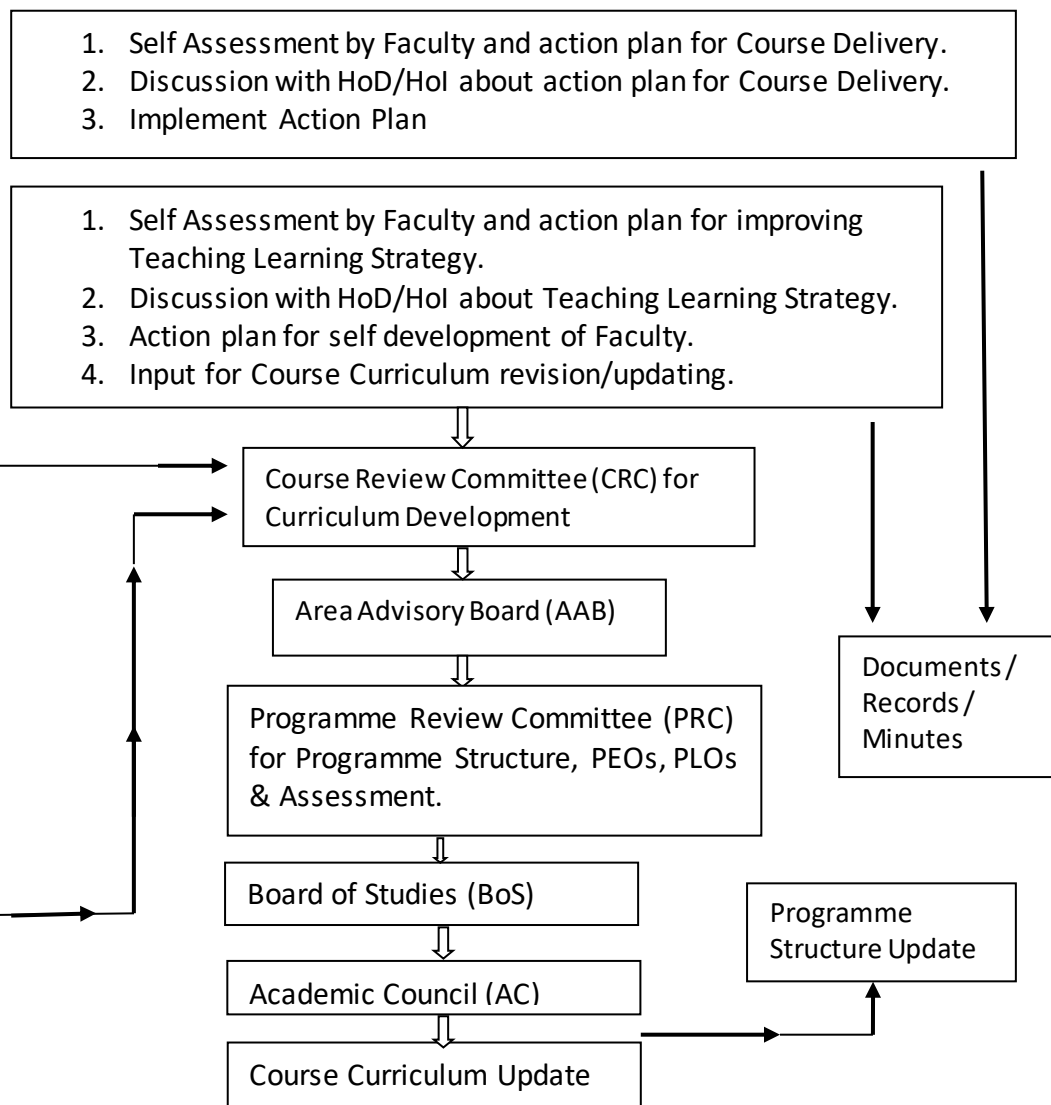
STRATEGIC PROCESS OF CONTINUOUS IMPROVEMENTS

Outcome Assessment Plan – 2022-2023

Student Feedback



Action Plan



8. Appendices : Format of Assessment Tools (To be Added)

Outcome Assessment Plan – 2022-2023

9. Domain Leadership & Assessment Team

1	Programme Review And Outcome Assessment Committee	Chairman	Prof (Dr.) Rekha Agarwal Prof (Dr.) Sapna Sinha (Coordinator)
	(PROAC)BCA + BCA (Evening) +BCA (H/R)	Coordinator	Dr. Komal Saxena
		Members	Dr. Rachna Jain Dr. Alka Chaudhary Dr. Gurpreet Kaur Dr. Misbah Anjum Dr. S. K. Singh – AIITL
	(PROAC)BSc.(IT) + B.Sc. (IT)(H/R) + B.Sc.(AI&DA)	Coordinator	Dr. Rashmi Vashisth
		Members	Dr. Nidhi Sindhwani Dr. Seema Rani Dr. Rajbala Simon Dr. Sudhriti Sen Gupta Dr. S. K. Singh – AIITL
	(PROAC)BCA+MCA (DUAL)	Coordinator	Dr. Mayank Sharma
		Members	Dr. Sakshi Gupta Dr. Reshu Agarwal Dr. Deepa Gupta Ms. Ruchika Bathla
	(PROAC)MCA	Coordinator	Dr. Monika Sharma
		Members	Dr. Himanshu Gupta Dr. Deepak Kumar Dr. Ajay Vikram Singh Dr. Suchi Sethi Dr. S. K. Singh – AIITL
	(PROAC) M.Sc (IT) +M.Sc.(AI&DA)	Coordinator	Dr. Monika Sharma
		Members	Dr. Sarika Jain Dr. Neetu Mittal

Outcome Assessment Plan – 2022-2023

		Dr. Sonu Mittal Dr. Prashant Shrivastava Dr. Sandhya Verma
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