

CRITERION 1	Outcome-based Curriculum	120 Marks
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1.1. Vision, Mission and Program Educational Objectives (PEOs) (35 Marks)

1.1.1. State the Vision and Mission of the Institute and the Department. (5 Marks)

Institute Vision

To be a world-class centre for engineering, technology and management, empowering individuals ethically to lead, innovate and thrive in an ever-evolving global landscape and create socially responsible citizens.

Institute Mission

- To foster a culture of academic excellence, intellectual and personal growth and practical training** that includes hands-on experience in the fields of engineering, technology, and management.
- To advance knowledge and drive innovation** through cutting-edge research and development in engineering, technology and management.
- To bridge the gap between academia and industry** by offering industry aligned programs, practical experience and hands-on training in engineering, technology and management that prepare students to lead, innovate and thrive in an ever-evolving global landscape.
- To prioritise health, safety, diversity, equity and inclusion** to create a welcoming and inclusive environment that produces socially responsible citizens.
- To prepare students for successful careers and fulfilling lives** by equipping them with the knowledge, skills and ethical principles needed to lead, innovate and thrive in their chosen fields, while emphasising hands-on training as a vital component of their education.

Department Vision

To be a world-class hub of excellence in Information Technology, fostering higher-level learning, cutting-edge research, and innovative technologies.

Department Mission

- DELIVER** high-quality IT education that aligns with student aspirations and potential, equipping them with cutting-edge skills for a dynamic digital world.
- INSPIRE** a passion for learning and innovation by fostering creativity, problem-solving, and hands-on experience with emerging technologies.
- TRANSFORM** talents into socially responsible IT professionals who leverage technology to address real-world challenges and serve society ethically.

1.1.2. State PEOs of the Program (5 Marks)

1. **Graduates will have a sound foundation** in the mathematical, scientific and engineering fundamentals to formulate, solve, and analyze problems related to Information and Technology.
2. **Graduates will have employment** in IT industries, and will be socially responsible and integrated with professional and ethical skills.
3. **Graduates will be involved** in research, higher studies and/or will become entrepreneurs in the long run.

1.1.3. Process of Defining Vision, Mission and PEOs (10 Marks)

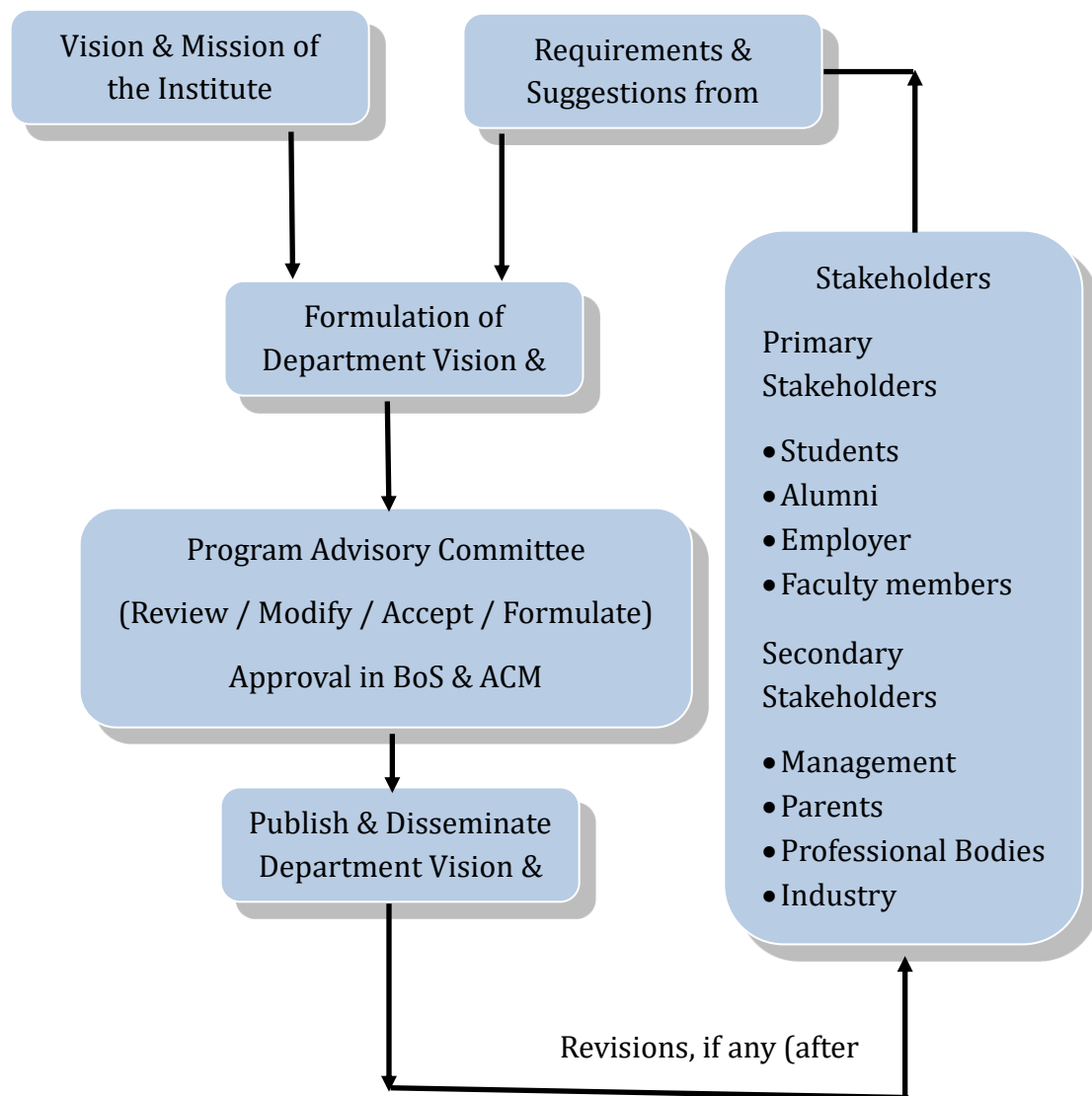


Fig.1.1.3 (a) Department Vision & Mission framing: Strategic plan

The formulation of the Department's Vision and Mission, along with the Program Educational Objectives (PEOs), is a strategic and multi-stage process designed to ensure relevance, ambition, and stakeholder alignment. The entire workflow can be visualized as follows:

Phase 1: Foundational Inputs and Context Setting

This initial phase is about gathering the necessary information and understanding the broader context.

1. **Anchor to Institutional Framework:** The process begins by thoroughly reviewing the **Institute's Vision and Mission**. The department's statements must be a direct and coherent extension of the parent institution's core values and aspirations.

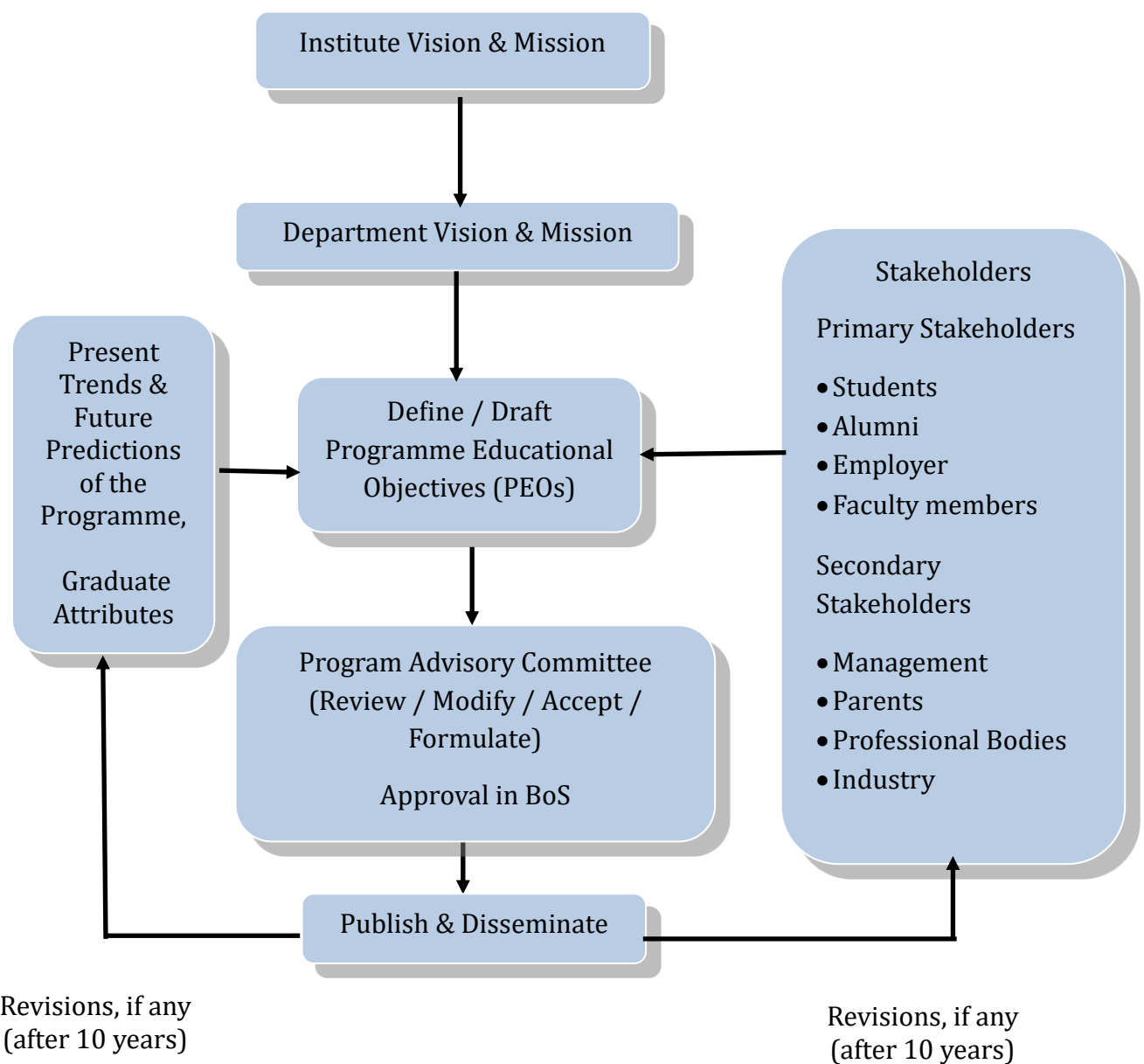


Fig.1.1.3 (b) Department PEOs Framing: Strategic Plan

2. **Environmental Scanning (SWOT Analysis):** A structured SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis is conducted for the department.

- **Strengths:** Existing faculty expertise, research facilities, successful alumni, strong industry connections.
- **Weaknesses:** Resource limitations, skill gaps in emerging areas, high student-faculty ratio.
- **Opportunities:** New technological trends (e.g., AI, Cybersecurity), potential for new industry partnerships, government funding schemes.
- **Threats:** Competition from other institutions, rapidly changing industry demands, economic downturns affecting placements.

Phase 2: Stakeholder Collaboration and Drafting

This is the core collaborative phase where inputs are gathered from all key stakeholders.

1. **Formation of a Committee:** A dedicated Program Advisory Committee is formed, comprising the Department Head, senior faculty, young faculty, academic and industry expert advisors along with students, alumni and parents as stakeholders.

2. **Stakeholder Consultations:**

- **Faculty:** Provide insights on academic rigor, research focus, and curriculum capabilities.
- **Students, Parents & Alumni:** Offer perspective on student aspirations, career outcomes, and the relevance of their education to their professional lives. Alumni success stories are particularly valuable for PEOs.
- **Industry Partners:** Provide critical input on current and future skill demands, ethical practices in the workplace, and the qualities they seek in graduates. This is crucial for making PEOs relevant to employment (e.g., PEO 2).
- **Program Advisory Committee :** A high-level board comprising industry leaders and academic experts' reviews and validates the drafts.

3. **Drafting the Statements:**

- **Vision Drafting:** The committee brainstorms aspirational, long-term goals. The vision is crafted to be inspirational and forward-looking (e.g., "To be a world-class hub of excellence...").
- **Mission Drafting:** The mission is derived from the vision. It outlines the actionable path to achieve the vision, focusing on the department's core activities like delivering education, inspiring innovation, and serving society.
- **PEO Formulation:** PEOs are specific statements about what graduates are expected to achieve 3-5 years after graduation. They are drafted based directly on stakeholder feedback:

- **PEO 1 (Technical Competence):** Derived from faculty and industry input on necessary fundamentals.
- **PEO 2 (Professional & Ethical Employment):** Directly influenced by industry partners and alumni, emphasizing social responsibility and ethical skills.
- **PEO 3 (Lifelong Learning & Entrepreneurship):** Captures the aspirations for higher studies, research, and innovation, often inspired by the success of past alumni.

Phase 3: Alignment, Integration, and Formal Approval

1. **Internal Alignment Check:** The drafted Vision, Mission, and PEOs are checked for internal consistency. The PEOs must directly support the Department Mission, which in turn must align with the Department Vision and the Institute's overarching statements.
2. **Iterative Refinement:** The drafts are shared with a wider group of stakeholders for feedback and refined through several iterations to ensure clarity, consensus, and comprehensiveness.
3. **Formal Approval:** The final versions are presented to the Program Advisory Committee, Board of Studies and the Institute's Academic Council for formal ratification and approval.

Phase 4: Implementation, Communication, and Review

1. **Publication and Communication:** Once approved, the Vision, Mission, and PEOs are published on the department's website, in brochures, and within the curriculum. They are communicated to all incoming students and faculty.
2. **Operationalization:** The PEOs are mapped to Program Outcomes (POs)/Graduate Attributes, which then inform the course curriculum, teaching methodologies, and assessment processes. This ensures that the daily academic activities are directly contributing to the achievement of the long-term objectives.
3. **Periodic Review and Revision:** This is a critical, ongoing phase. The Vision, Mission, and PEOs are not static. They are reviewed periodically (e.g., every 3-5 years) based on:
 - Feedback from fresh stakeholder surveys.
 - Analysis of alumni career trajectories.
 - Changes in the technological landscape and industry requirements.
 - New opportunities and strategic directions for the institute.

This structured and inclusive process ensures that the Department's guiding statements are not just decorative but are living, breathing documents that actively guide the program's development and ensure its graduates are well-prepared for future challenges.

1.1.4. Dissemination of Vision, Mission and PEOs (5 Marks)

The Vision, Mission and PEOs are published and disseminated among various internal stakeholders (Management, Governing Council members, Faculty members and Students) and External stakeholders (Parents, Employers/Industries, Professional Bodies and Alumni) through various modes and occasions as mentioned in the following tables 1.1.4 (a) & (b):

Table 1.1.4 (a) Publishing Modes of Vision, Mission and PEOs

➤ **PUBLISHING MODES**

Vision Mission PEOs	Level	Modes of Publishing	Internal Stake Holders	External Stake Holders
	Institute Level	1. College Website (www.easacollege.com)	√	√
		2. Academic Calendar	√	-
		3. College Brochure	√	√
		4. Administrative Notice Board	√	√
		5. College Placement Brochure	-	√
		6. Curriculum Book	√	-
		7. First Year Orientation Program	√	√
	Department Level	1. Department Magazine	√	√
		2. Notice Board	√	√
		3. Department Office	√	√
		4. Department Placement Brochure	-	√
		5. Laboratory Manuals	√	-
		6. Course File	√	-
		7. Curriculum Book	√	√

Table 1.1.4 (b) Disseminating Modes of Vision, Mission and PEOs

➤ **DISSEMINATION MODES**

Vision Mission PEOs	Level	Modes of Publishing	Internal Stake Holders	External Stake Holders
	Institute & Department Levels	1. Conferences	√	-
		2. Students Orientation	√	√
		3. College Programs	√	√
		4. Parent Teacher Meetings	√	√
		5. Meetings With HR	√	√
		6. Alumni Meetings	√	√
		7. Association Activities	√	√
		8. Students Prologue	√	√
		9. Industry visits by Faculty members	√	√
		10. HR Conclaves	√	√

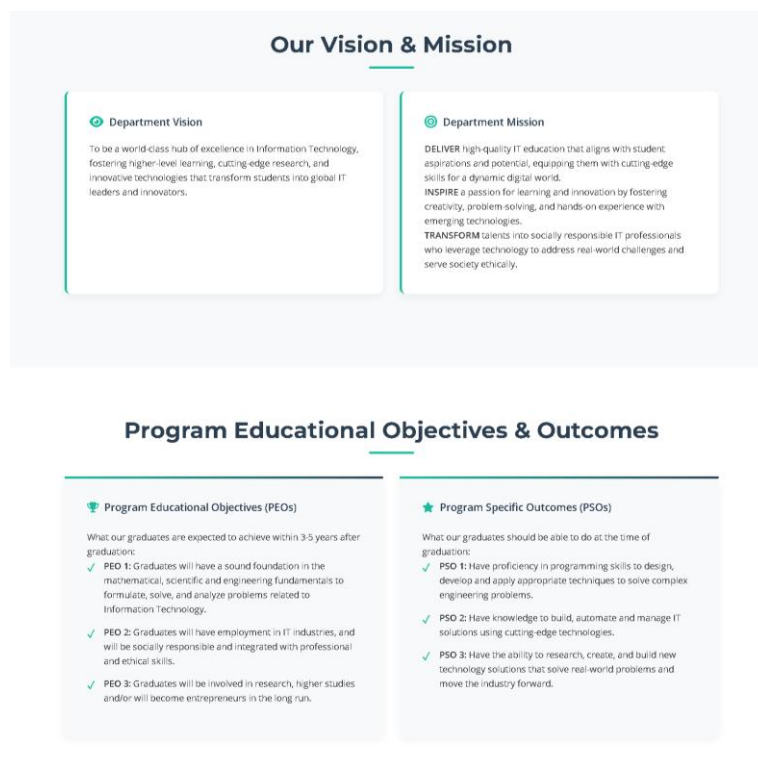


Fig.1.1.4 (a) Publishing & Disseminating Modes for Vision, Mission, PEOs

1.1.5. Mapping of PEOs with Mission (10 Marks)

(Generate a Mission of the Department–PEOs matrix with justification and rationale of the mapping.)

Table No.1.1.5.1: Mapping of PEOs with Mission

PEO Statements	M ₁	M ₂	M ₃
PEO1: Graduates will have a sound foundation in the mathematical, scientific and engineering fundamentals to formulate, solve, and analyze problems related to Information and Technology.	3	2	1
PEO2: Graduates will have employment in IT industries, and will be socially responsible and integrated with professional and ethical skills.	3	2	3
PEO3: Graduates will be involved in research, higher studies and/or will become entrepreneurs in the long run.	2	3	1

Justification and Rationale for Mapping

The mapping is based on a direct analysis of how each departmental mission activity contributes to achieving the long-term graduate objectives.

Mapping for PEO1 (Sound Foundation)

- **M₁ (DELIVER) - Strong (3):** This is the most direct relationship. A "sound foundation" is the primary outcome of the mission to **DELIVER** high-quality, fundamental IT education. The curriculum, teaching, and assessment are all designed specifically for this purpose.
- **M₂ (INSPIRE) - Moderate (2):** While inspiring passion is not the main driver for building fundamentals, the "hands-on experience" mentioned in M₂ reinforces and deepens the understanding of fundamental concepts, providing a moderate level of support.
- **M₃ (TRANSFORM) - Weak (1):** The transformation into a socially responsible professional, while crucial, does not directly contribute to building core engineering fundamentals. The connection is indirect and therefore weak.

Mapping for PEO2 (Employment & Social Responsibility)

- **M₁ (DELIVER) - Strong (3):** Employability is heavily dependent on possessing the "cutting-edge skills" delivered by the program. A strong technical foundation is a primary requirement for gaining employment in the IT industry.
- **M₂ (INSPIRE) - Moderate (2):** A passion for learning and innovation makes a graduate more adaptable and valuable to employers, thus moderately supporting employment. However, it is not as direct as skill delivery.
- **M₃ (TRANSFORM) - Strong (3):** This is a direct and strong correlation. The mission to **TRANSFORM** students into "socially responsible IT professionals who serve society ethically" is the exact mechanism for achieving the social responsibility and ethical skills component of PEO2.

Mapping for PEO3 (Research, Higher Studies & Entrepreneurship)

- **M₁ (DELIVER) - Moderate (2):** A sound foundation (from M₁) is a necessary prerequisite for pursuing higher studies and research. However, delivery of knowledge alone does not guarantee a drive for innovation or entrepreneurship.
- **M₂ (INSPIRE) - Strong (3):** This is the most critical relationship for PEO3. The mission to **INSPIRE** a "passion for learning and innovation" and foster "creativity" is the fundamental driver that leads graduates to pursue research, higher studies, and entrepreneurial ventures.
- **M₃ (TRANSFORM) - Weak (1):** While a sense of social responsibility might guide the *area* of research or entrepreneurship, the transformation process itself does not directly create the aspiration for it. The connection is tangential.

1.2. Curriculum Structure and Features (30 Marks)

1.2.1. State the Process for Developing/Revising the Program Curriculum (10 Marks)

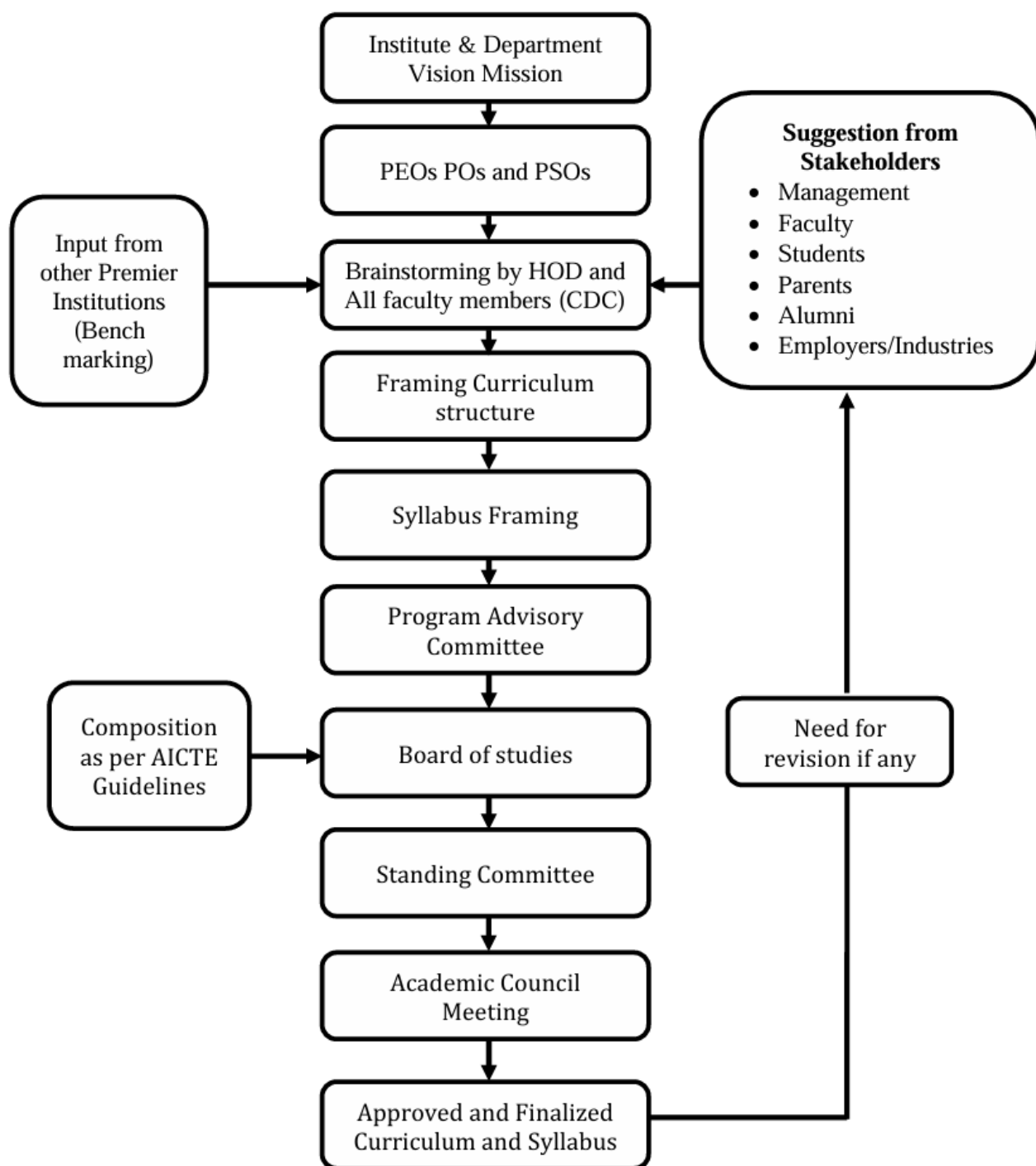


Fig.1.2.1 (a) Process for Developing / Revising the Program Curriculum

1.2.2. Curriculum Structure (10 Marks)

Table No.1.2.2.1: Details of various courses presented in terms of teaching and learning scheme

R2024- CURRICULUM STRUCTURE

Course Code	Course Titles	Teaching & Learning Scheme					
		Classroom Instruction (CI) (in hours per semester)		Lab instruction (LI) (in hours per semester)	Term Work (TW) and Self Learning (SL) (TW + SL) (in hours per semester)	Total no. of Hours per semester	Total Credits* (Total Hours / 30)
		L	T	P	SL		
U24EN101	Professional English - I	50	0	0	40	90	90/30=3
U24MA101	Engineering Mathematics - I	60	20	0	40	120	120/30=4
U24PH101	Engineering Physics	50	0	0	40	90	90/30=3
U24CH101	Engineering Chemistry	50	0	0	40	90	90/30=3
U24CS101	Problem Solving and Python Programming	50	0	0	40	90	90/30=3
U24TM101	தமிழர் மரபு / Heritage of Tamils	20	0	0	10	30	30/30=1
U24CS1L1	Problem Solving and Python Programming Laboratory	0	0	45	15	60	60/30=2
U24BS1L1	Physics and Chemistry Laboratory	0	0	45	15	60	60/30=2
U24EN1L1	English Laboratory	0	0	20	10	30	30/30=1
U24EN201	Professional English - II	40	0	0	20	60	60/30=2
U24MA201	Engineering Mathematics - II	60	20	0	40	120	120/30=4
U24PH201	Applied Physics	50	0	0	40	90	90/30=3
U24ME201	Engineering Graphics	40	40	0	40	120	120/30=4
U24TM201	தமிழரும் தொழில்நுட்பமும் / Tamils & Technology	20	0	0	10	30	30/30=1
U24EE203	Basic Electrical and Electronics Engineering	50	0	0	40	90	90/30=3
U24CS201	Programming in C	50	0	0	40	90	90/30=3
U24ME2L1	Engineering Practices Laboratory	0	0	45	15	60	60/30=2
U24EN2L1	Communication Skills Laboratory	0	0	45	15	60	60/30=2
U24CS2L1	Programming in C Laboratory	0	0	45	15	60	60/30=2
U24MA301	Engineering Mathematics - III	60	20	0	40	120	120/30=4

U24IT301	Foundations of Data Science	50	0	0	40	90	90/30=3
U24IT302	Data Structures and Algorithms	50	0	0	40	90	90/30=3
U24CS303	Object Oriented Programming	50	0	0	40	90	90/30=3
U24CS301	Digital Principles and Computer Organization	45	0	60	15	120	120/30=4
U24IT3L1	Data Structures and Algorithms Laboratory	0	0	30	15	45	45/30=1.5
U24CS3L2	Object Oriented Programming Laboratory	0	0	30	15	45	45/30=1.5
U24IT3L2	Data Science Laboratory	0	0	45	15	60	60/30=2
U24CS401	Theory of Computation	3	1	0		120	120/30=4
U24CS403	Database Management Systems	50	0	0	40	90	90/30=3
U24BS401	Environmental Sciences and Sustainability	50	0	0	40	90	90/30=3
U24CS405	Introduction to Operating Systems	50	0	0	40	90	90/30=3
U24CS402	Foundations of Artificial Intelligence and Machine Learning	45	0	60	15	120	120/30=4
U24IT401	Web Essentials	45	0	60	15	120	120/30=4
U24CS4L1	Operating Systems Laboratory	0	0	30	15	45	45/30=1.5
U24CS4L2	Database Management Systems Laboratory	0	0	30	15	45	45/30=1.5
U24TP402	Microsoft Essentials	0	0	20	10	30	30/30=1
U24CS504	Distributed Computing	50	0	0	40	90	90/30=3
U24IT501	Full Stack Web Development	50	0	0	40	90	90/30=3
U24YYOEX	Open Elective – I	50	0	0	40	90	90/30=3
U24CS501	Computer Networks	45	0	60	15	120	120/30=4
U24CS602	Embedded Systems and IoT	45	0	60	15	120	120/30=4
U24DS503	Big Data Analytics	40	0	40	10	90	90/30=3
U24YYPXX	Professional Elective – I	40	0	40	10	90	90/30=3
U24IT5L1	Full Stack Web Development Laboratory	0	0	45	15	60	60/30=2
U24TP5XX	Technical Training Course - I	0	0	20	10	30	30/30=1
U24YYOEX	Open Elective – II	50	0	0	40	90	90/30=3
U24CS601	Object Oriented Software Engineering	45	0	60	15	120	120/30=4
U24IT601	DevOps	40	0	40	10	90	90/30=3

U24YYPXX	Professional Elective – II	40	0	40	10	90	90/30=3
U24EM601	Mini Project	0	0	30	30	30	30/30=1
U24TP6XX	Technical Training Course - II	0	0	30	30	30	30/30=1
U24BA701	Professional Ethics and Managerial Skills	45	0	0	15	60	60/30=2
U24YYOEX	Open Elective – III	50	0	0	40	90	90/30=3
U24YYOEX	Open Elective – IV	50	0	0	40	90	90/30=3
U24YYPXX	Professional Elective – III	40	0	40	10	90	90/30=3
U24YYPXX	Professional Elective – IV	40	0	40	10	90	90/30=3
U24EM701	Internship			4 week	60	60	60/30=2
U24EM801	Project Work	0	0	180	180	360	360/30=12

R 2021 - CURRICULUM STRUCTURE

Course Code	Course Titles	Teaching & Learning Scheme					
		Classroom Instruction (CI) (in hours per semester)		Lab instruction (LI) (in hours per semester)	Term Work (TW) and Self Learning (SL) (TW + SL) (in hours per semester)	Total no. of Hours per semester	Total Credits* (Total Hours / 30)
		L	T	P	SL		
HS3152	Professional English - I	50	0	0	40	90	90/30=3
MA3151	Matrices and Calculus	60	20	0	40	120	120/30=4
PH3151	Engineering Physics	50	0	0	40	90	90/30=3
CY3151	Engineering Chemistry	50	0	0	40	90	90/30=3
GE3151	Problem Solving and Python Programming	50	0	0	40	90	90/30=3
GE3152	தமிழர் மரபு /Heritage of Tamils	20	0	0	10	30	30/30=1
GE3171	Problem Solving and Python Programming Laboratory	0	0	45	15	60	60/30=2
BS3171	Physics and Chemistry Laboratory	0	0	45	15	60	60/30=2
GE3172	English Laboratory	0	0	20	10	30	30/30=1
HS3252	Professional English - II	40	0	0	20	60	60/30=2
MA3251	Statistics and Numerical Methods	60	20	0	40	120	120/30=4
PH3256	Physics for Information Science	50	0	0	40	90	90/30=3

BE3251	Basic Electrical and Electronics Engineering	50	0	0	40	90	90/30=3
GE3251	Engineering Graphics	40	40	0	40	120	120/30=4
CS3251	Programming in C	50	0	0	40	90	90/30=3
GE3252	தமிழரும் தொழில்நுட்பமும் Tamils and Technology	20	0	0	10	30	30/30=1
GE3271	Engineering Practices Laboratory	0	0	45	15	60	60/30=2
CS3271	Programming in C Laboratory	0	0	45	15	60	60/30=2
GE3272	Communication Laboratory / Foreign Language	0	0	45	15	60	60/30=2
MA3354	Discrete Mathematics	60	20	0	40	120	120/30=4
CS3351	Digital Principles and Computer Organization	45	0	60	15	120	120/30=4
CS3352	Foundations of Data Science	50	0	0	40	90	90/30=3
CD3291	Data Structures	50	0	0	40	90	90/30=3
CS3391	Object Oriented Programming	50	0	0	40	90	90/30=3
CD3281	Data Structures Laboratory	0	0	45	15	60	60/30=2
CS3381	Object Oriented Programming Laboratory	0	0	30	15	45	45/30=1.5
CS3361	Data Science Laboratory	0	0	45	15	60	60/30=2
GE3361	Professional Development	20	0	0	10	30	30/30=1
CS3452	Theory of Computation	50	0	0	40	90	90/30=3
CS3491	Artificial Intelligence and Machine Learning	45	0	60	15	120	120/30=4
CS3492	Database Management Systems	50	0	0	40	90	90/30=3
IT3401	Web Essentials	45	0	60	15	120	120/30=4
CS3451	Introduction to Operating Systems	50	0	0	40	90	90/30=3
GE3451	Environmental Sciences and Sustainability	40	0	0	20	60	60/30=2
CS3461	Operating Systems Laboratory	0	0	30	15	45	45/30=1.5
CS3481	Database Management Systems Laboratory	0	0	30	15	45	45/30=1.5
CS3591	Computer Networks	45	0	60	15	120	120/30=4
IT3501	Full Stack Web Development	50	0	0	40	90	90/30=3
CS3551	Distributed Computing	50	0	0	40	90	90/30=3
CS3691	Embedded Systems and IoT	45	0	60	15	120	120/30=4

CCS366	Professional Elective I - Software testing and automation	40	0	40	10	90	90/30=3
CCS331	Professional Elective II - 3D printing and Design	40	0	40	10	90	90/30=3
IT3511	Full Stack Web Development Laboratory	0	0	45	15	60	60/30=2
CCS356	Object Oriented Software Engineering	45	0	60	15	120	120/30=4
OEE351	Open Elective – I* - Renewable Energy Systems	50	0	0	40	90	90/30=3
CCS335	Professional Elective III -Cloud computing	40	0	40	10	90	90/30=3
CCS372	Professional Elective IV - Virtualization	40	0	40	10	90	90/30=3
CCS370	Professional Elective V - UI/UX Design	40	0	40	10	90	90/30=3
CCS365	Professional Elective VI - Software Defined Networks	40	0	40	10	90	90/30=3
IT3681	Mobile Applications Development Laboratory	0	0	30	15	45	45/30=1.5
GE3791	Human Values and Ethics	40	0	0	20	60	60/30=2
GE3751	Elective - Management# - Principles of Management	50	0	0	40	90	90/30=3
AI3021	Open Elective – II** - IT in Agriculture Systems	50	0	0	40	90	90/30=3
OME352	Open Elective – III** - Additive Manufacturing	50	0	0	40	90	90/30=3
AU3008	Open Elective – IV** - Sensors and Actuators	50	0	0	40	90	90/30=3
IT3711	Summer Internship			4 week	60	60	60/30=2
IT3681	Project Work Internship	0	0	150	150	300	300/30=10

1.2.3. Components of Curriculum (5 Marks)

Table No.1.3.3.1: Program curriculum grouping based on curriculum components

R2024 - CURRICULUM STRUCTURE COMPONENTS

Curriculum Component	Curriculum Content (% total number of credits of the program)	Total number of contact hours	Total number of credits
Basic Sciences	16	780	26
Basic Engineering	11	540	18
Humanities and Social Sciences	7	360	12
Program Core	41	1980	66
Program Electives	7	360	12
Open Electives	7	360	12
Project(s)	7	360	12
Internships/Seminars	4	180	6
Any other (please specify)	0		0
Total number of Credits:			164

R2021 - CURRICULUM STRUCTURE COMPONENTS

Curriculum Component	Curriculum Content (% total number of credits of the program)	Total number of contact hours	Total number of credits
Basic Sciences	15.43	780	25
Basic Engineering	11.11	540	18
Humanities and Social Sciences	7.41	360	12
Program Core	37.65	1980	61
Program Electives	11.11	360	18
Open Electives	7.41	360	12
Project(s)	6.17	300	10
Internships/Seminars	1.23	60	2
Any other (please specify) -EEC	2.47	120	4
Total number of Credits:			162

1.2.4. Strategies for Education Reforms (5 Marks)

The institution has developed a comprehensive strategy to implement the National Education Policy (NEP) 2020 guidelines by redesigning the curriculum to be more flexible, student-centric, and aligned with national frameworks. The plan is multi-faceted, focusing on curriculum structure, credit management, and student identity.

1. Curriculum Design: Infusing Multidisciplinary and Interdisciplinary Approaches

Objective: To move beyond siloed learning and foster holistic problem-solving skills.

Activity Mapping in Curriculum:

- **Core Courses:** Provide deep knowledge in the primary discipline (e.g., Computer Science).
- **Disciplinary Electives:** Offer specialized tracks within the major (e.g., AI, IoT).
- **Multidisciplinary Courses (MDCs):** Mandate courses from unrelated fields to broaden perspectives. For example:

A CS student takes a course in "Design Thinking" (from Design) or "Entrepreneurship Fundamentals" (from Management).

Activity: Mapping these to "Individual and team work" (PO8) and "Communication" (PO9).

Interdisciplinary Courses (IDCs): Offer courses that merge two or more disciplines to create new knowledge domains. For example: "CSE (CS)" (CS + Cybersecurity)

Activity: Mapping these to "Problem analysis" (PO2) and "Design/development of solutions" (PO3).

Value-Added Courses: Include modules on digital literacy, soft skills, and environmental science, mapped to relevant POs like "Ethics" (PO7) and "Life-long learning" (PO11).

2. Establishment of an Academic Bank of Credits (ABC)

Objective: To enable student-centric learning by providing flexibility and mobility.

Implementation Plan:

- **ABC Registration:** Mandate all students to register on the national ABC portal at the time of university enrollment.
- **Credit Digitization:** The university's examination wing will be responsible for digitally depositing the credits earned from every course (core, elective, MDC, IDC) into the student's unique ABC account.
- **Credit Validity & Redemption:** Credits will be valid for a stipulated period (e.g., 7 years). Students can redeem these credits upon completion of the program to receive their degree. This allows for multiple entry and exit points.

- **Lateral Entry/Flexibility:** Students who have earned credits from other ABC-registered institutions (e.g., from a online SWAYAM course) can request a credit transfer, which will be verified and accepted as per university norms, enriching their learning pathway.

3. Integration of APAAR (One Nation One Student ID)

Objective: To create a unified and verified record of a student's academic journey.

Implementation Plan:

- **Centralized Identity:** APAAR ID will be the single, permanent reference number for every student from school onwards.
- **Seamless Data Linkage:** The institution's administrative system will be integrated with the APAAR ecosystem. This will automate the process of updating the ABC with earned credits and populating the student's Digital Locker.
- **Holistic Portfolio:** The APAAR ID will not just store academic credits but also link to co-curricular achievements (e.g., "Parakram" points for sports, skills badges, internship certificates). This provides a comprehensive picture of the student's capabilities to potential employers and higher education institutions.

4. Collaboration and Industry/Research Partnerships

- Leveraging MOUs with industry and other institutions to provide guest lectures, joint projects, internships, industrial visits for interdisciplinary exposure.
- Establishing Centers of Excellence or labs where interdisciplinary work is encouraged (e.g., robotics, IoT, smart agriculture, renewable energy).
- Encouraging faculty-led interdisciplinary research, and embed research-infused learning into the curriculum.

5. Continuous Improvement

- Continuously monitor curriculum delivery, collect feedback, conduct audits and refine modules.
- In each semester's plan include review points: mapping of activities vs outcomes, evaluation of student engagement, mapping of interdisciplinary exposure, industry relevance.

1.3. PO, PSO and their Mapping with Courses (20 Marks)

1.3.1. POs and PSOs (5 Marks)

PROGRAMME OUTCOMES

PO1 Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2 Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development.

PO3 Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required.

PO4 Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis interpretation of data to provide valid conclusions.

PO5 Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems.

PO6 The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment.

PO7 Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws.

PO8 Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9 Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10 Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11 Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES

Graduates should be able to:

PSO1. Have proficiency in programming skills to design, develop and apply appropriate techniques, to solve complex engineering problems.

PSO2. Have knowledge to build, automate and manage IT solutions using cutting-edge technologies.

PSO3. Have the ability to research, create, and build new technology solutions that solve real-world problems and move the industry forward.

1.3.2. Mapping between the Courses and POs/PSOs (15 Marks)

Table No.1.3.1: Connection of courses with POs/PSOs

R2024- MAPPING OF COURSES WITH PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES

PO Number	List of Courses	
PO1:	U24MA101	Engineering Mathematics – I
	U24PH101	Engineering Physics
	U24CH101	Engineering Chemistry
	U24CS101	Problem Solving and Python Programming
	U24CS1L1	Problem Solving and Python Programming Laboratory
	U24BS1L1	Physics and Chemistry Laboratory
	U24MA201	Engineering Mathematics – II
	U24PH201	Applied Physics
	U24ME201	Engineering Graphics
	U24EE203	Basic Electrical and Electronics Engineering
	U24CS201	Programming in C
	U24ME2L1	Engineering Practices Laboratory
	U24CS2L1	Programming in C Laboratory
	U24MA301	Engineering Mathematics – III
	U24IT301	Foundations of Data Science
	U24IT302	Data Structures and Algorithms
	U24CS303	Object Oriented Programming
	U24CS301	Digital Principles and Computer Organization
	U24IT3L1	Data Structures and Algorithms Laboratory
	U24CS3L2	Object Oriented Programming Laboratory
	U24IT3L2	Data Science Laboratory
	U24CS401	Theory of Computation
	U24CS403	Database Management Systems
	U24CS405	Introduction to Operating Systems
	U24CS402	Foundations of Artificial Intelligence and Machine Learning
	U24IT401	Web Essentials
	U24CS4L1	Operating Systems Laboratory
	U24CS4L2	Database Management Systems Laboratory
PO2:	U24MA101	Engineering Mathematics – I

	U24PH101 Engineering Physics U24CH101 Engineering Chemistry U24CS101 Problem Solving and Python Programming U24CS1L1 Problem Solving and Python Programming Laboratory U24BS1L1 Physics and Chemistry Laboratory U24MA201 Engineering Mathematics – II U24PH201 Applied Physics U24ME201 Engineering Graphics U24EE203 Basic Electrical and Electronics Engineering U24CS201 Programming in C U24ME2L1 Engineering Practices Laboratory U24CS2L1 Programming in C Laboratory U24MA301 Engineering Mathematics – III U24IT301 Foundations of Data Science U24IT302 Data Structures and Algorithms U24CS303 Object Oriented Programming U24CS301 Digital Principles and Computer Organization U24IT3L1 Data Structures and Algorithms Laboratory U24CS3L2 Object Oriented Programming Laboratory U24IT3L2 Data Science Laboratory U24CS401 Theory of Computation U24CS403 Database Management Systems U24CS405 Introduction to Operating Systems U24CS402 Foundations of Artificial Intelligence and Machine Learning U24IT401 Web Essentials U24CS4L1 Operating Systems Laboratory U24CS4L2 Database Management Systems Laboratory U24TP401 Career Enhancement Course - II
PO3:	U24MA101 Engineering Mathematics – I U24CS101 Problem Solving and Python Programming U24CS1L1 Problem Solving and Python Programming Laboratory U24BS1L1 Physics and Chemistry Laboratory U24MA201 Engineering Mathematics – II U24ME201 Engineering Graphics U24EE203 Basic Electrical and Electronics Engineering U24CS201 Programming in C U24CS2L1 Programming in C Laboratory U24MA301 Engineering Mathematics – III U24IT301 Foundations of Data Science U24IT302 Data Structures and Algorithms U24CS303 Object Oriented Programming U24CS301 Digital Principles and Computer Organization U24IT3L1 Data Structures and Algorithms Laboratory U24CS3L2 Object Oriented Programming Laboratory U24IT3L2 Data Science Laboratory U24CS401 Theory of Computation U24CS403 Database Management Systems U24CS405 Introduction to Operating Systems U24CS402 Foundations of Artificial Intelligence and Machine Learning U24IT401 Web Essentials U24CS4L1 Operating Systems Laboratory U24CS4L2 Database Management Systems Laboratory
PO4:	U24MA101 Engineering Mathematics – I U24PH101 Engineering Physics U24CS101 Problem Solving and Python Programming

	U24CS1L1	Problem Solving and Python Programming Laboratory
	U24BS1L1	Physics and Chemistry Laboratory
	U24PH201	Applied Physics
	U24CS201	Programming in C
	U24CS2L1	Programming in C Laboratory
	U24IT301	Foundations of Data Science
	U24IT302	Data Structures and Algorithms
	U24CS303	Object Oriented Programming
	U24CS301	Digital Principles and Computer Organization
	U24IT3L1	Data Structures and Algorithms Laboratory
	U24CS3L2	Object Oriented Programming Laboratory
	U24IT3L2	Data Science Laboratory
	U24CS401	Theory of Computation
	U24CS403	Database Management Systems
	U24CS405	Introduction to Operating Systems
	U24CS402	Foundations of Artificial Intelligence and Machine Learning
	U24IT401	Web Essentials
	U24CS4L1	Operating Systems Laboratory
	U24CS4L2	Database Management Systems Laboratory
PO5:	U24EN101	Professional English – I
	U24CS101	Problem Solving and Python Programming
	U24CS1L1	Problem Solving and Python Programming Laboratory
	U24EN1L1	English Laboratory
	U24EN201	Professional English – II
	U24MA201	Engineering Mathematics – II
	U24ME201	Engineering Graphics
	U24CS201	Programming in C
	U24ME2L1	Engineering Practices Laboratory
	U24EN2L1	Communication Skills Laboratory
	U24CS2L1	Programming in C Laboratory
	U24IT301	Foundations of Data Science
	U24IT302	Data Structures and Algorithms
	U24CS303	Object Oriented Programming
	U24CS301	Digital Principles and Computer Organization
	U24IT3L1	Data Structures and Algorithms Laboratory
	U24CS3L2	Object Oriented Programming Laboratory
	U24IT3L2	Data Science Laboratory
	U24CS401	Theory of Computation
	U24CS403	Database Management Systems
	U24CS405	Introduction to Operating Systems
	U24CS402	Foundations of Artificial Intelligence and Machine Learning
	U24CS4L1	Operating Systems Laboratory
	U24CS4L2	Database Management Systems Laboratory
PO6:	U24EN101	Professional English – I
	U24PH101	Engineering Physics
	U24CH101	Engineering Chemistry
	U24TM101	தமிழர் மரபு / Heritage of Tamils
	U24EN1L1	English Laboratory
	U24MC101	Induction Program
	U24EN201	Professional English – II
	U24PH201	Applied Physics
	U24TM201	தமிழரும் தொழில்நுட்பமும்/ Tamils & Technology
	U24CS201	Programming in C
	U24ME2L1	Engineering Practices Laboratory

	U24EN2L1 U24CS2L1 U24IT301 U24CS301 U24MC301 U24BS401 U24MC401 U24TP402	Communication Skills Laboratory Programming in C Laboratory Foundations of Data Science Digital Principles and Computer Organization Indian Traditional Knowledge Environmental Sciences and Sustainability Indian Constitution Microsoft Essentials
PO7:	U24EN101 U24TM101 U24EN1L1 U24MC101 U24EN201 U24TM201 U24EE203 U24CS201 U24EN2L1 U24MC201 U24CS301 U24BS401 U24MC401 U24TP402	Professional English – I தமிழர் மரபு / Heritage of Tamils English Laboratory Induction Program Professional English – II தமிழரும் தொழில்நுட்பமும்/ Tamils & Technology Basic Electrical and Electronics Engineering Programming in C Communication Skills Laboratory Universal Human Values Digital Principles and Computer Organization Environmental Sciences and Sustainability Indian Constitution Microsoft Essentials
PO8:	U24EN101 U24EN1L1 U24MC101 U24EN201 U24CS201 U24EN2L1 U24CS2L1 U24IT301 U24IT302 U24CS303 U24CS301 U24IT3L1 U24CS3L2 U24IT3L2 U24CS401 U24CS403 U24CS405 U24CS402 U24CS4L1 U24CS4L2	Professional English – I English Laboratory Induction Program Professional English – II Programming in C Communication Skills Laboratory Programming in C Laboratory Foundations of Data Science Data Structures and Algorithms Object Oriented Programming Digital Principles and Computer Organization Data Structures and Algorithms Laboratory Object Oriented Programming Laboratory Data Science Laboratory Theory of Computation Database Management Systems Introduction to Operating Systems Foundations of Artificial Intelligence and Machine Learning Operating Systems Laboratory Database Management Systems Laboratory
PO9:	U24EN101 U24EN1L1 U24MC101 U24EN201 U24ME201 U24EN2L1 U24CS2L1 U24IT301 U24CS303 U24CS301 U24IT3L1 U24CS3L2	Professional English – I English Laboratory Induction Program Professional English – II Engineering Graphics Communication Skills Laboratory Programming in C Laboratory Foundations of Data Science Object Oriented Programming Digital Principles and Computer Organization Data Structures and Algorithms Laboratory Object Oriented Programming Laboratory

	U24IT3L2 U24CS401 U24CS403 U24CS405 U24CS402 U24CS4L1 U24CS4L2 U24TP401	Data Science Laboratory Theory of Computation Database Management Systems Introduction to Operating Systems Foundations of Artificial Intelligence and Machine Learning Operating Systems Laboratory Database Management Systems Laboratory Career Enhancement Course - II
PO10:	U24EN101 U24CS101 U24CS1L1 U24EN1L1 U24MC101 U24EN201 U24CS201 U24EN2L1 U24CS2L1 U24IT301 U24IT302 U24CS303 U24CS301 U24IT3L1 U24CS3L2 U24IT3L2 U24CS401 U24CS403 U24CS405 U24CS402 U24CS4L1 U24CS4L2 U24TP401	Professional English – I Problem Solving and Python Programming Problem Solving and Python Programming Laboratory English Laboratory Induction Program Professional English – II Programming in C Communication Skills Laboratory Programming in C Laboratory Foundations of Data Science Data Structures and Algorithms Object Oriented Programming Digital Principles and Computer Organization Data Structures and Algorithms Laboratory Object Oriented Programming Laboratory Data Science Laboratory Theory of Computation Database Management Systems Introduction to Operating Systems Foundations of Artificial Intelligence and Machine Learning Operating Systems Laboratory Database Management Systems Laboratory Career Enhancement Course - II
PO11:	U24EN101 U24MA101 U24CH101 U24CS101 U24TM101 U24CS1L1 U24EN1L1 U24EN201 U24ME201 U24TM201 U24EE203 U24CS201 U24ME2L1 U24EN2L1 U24CS2L1 U24MC201 U24MA301 U24IT301 U24IT302 U24CS303 U24CS301 U24IT3L1 U24CS3L2	Professional English – I, Engineering Mathematics – I Engineering Chemistry Problem Solving and Python Programming தமிழர் மரபு / Heritage of Tamils Problem Solving and Python Programming Laboratory English Laboratory Professional English – II Engineering Graphics தமிழரும் தொழில்நுட்பமும்/ Tamils & Technology Basic Electrical and Electronics Engineering Programming in C Engineering Practices Laboratory Communication Skills Laboratory Programming in C Laboratory Universal Human Values Engineering Mathematics – III Foundations of Data Science Data Structures and Algorithms Object Oriented Programming Digital Principles and Computer Organization Data Structures and Algorithms Laboratory Object Oriented Programming Laboratory

	U24IT3L2	Data Science Laboratory
	U24MC301	Indian Traditional Knowledge
	U24CS401	Theory of Computation
	U24CS403	Database Management Systems
	U24BS401	Environmental Sciences and Sustainability
	U24CS405	Introduction to Operating Systems
	U24CS402	Foundations of Artificial Intelligence and Machine Learning
	U24IT401	Web Essentials
	U24CS4L1	Operating Systems Laboratory
	U24CS4L2	Database Management Systems Laboratory
	U24MC401	Indian Constitution
	U24TP401	Career Enhancement Course – II
	U24TP402	Microsoft Essentials
PSO1:	U24CS101	Problem Solving and Python Programming
	U24CS1L1	Problem Solving and Python Programming Laboratory
	U24ME201	Engineering Graphics
	U24CS201	Programming in C
	U24ME2L1	Engineering Practices Laboratory
	U24CS2L1	Programming in C Laboratory
	U24IT301	Foundations of Data Science
	U24IT302	Data Structures and Algorithms
	U24CS303	Object Oriented Programming
	U24CS301	Digital Principles and Computer Organization
	U24IT3L1	Data Structures and Algorithms Laboratory
	U24CS3L2	Object Oriented Programming Laboratory
	U24IT3L2	Data Science Laboratory
	U24CS401	Theory of Computation
	U24CS403	Database Management Systems
	U24CS405	Introduction to Operating Systems
	U24CS402	Foundations of Artificial Intelligence and Machine Learning
	U24CS4L1	Operating Systems Laboratory
	U24CS4L2	Database Management Systems Laboratory
PSO2:	U24CS101	Problem Solving and Python Programming
	U24CS1L1	Problem Solving and Python Programming Laboratory
	U24ME201	Engineering Graphics
	U24CS201	Programming in C
	U24ME2L1	Engineering Practices Laboratory
	U24CS2L1	Programming in C Laboratory
	U24IT301	Foundations of Data Science
	U24IT302	Data Structures and Algorithms
	U24CS303	Object Oriented Programming
	U24CS301	Digital Principles and Computer Organization
	U24IT3L1	Data Structures and Algorithms Laboratory
	U24CS3L2	Object Oriented Programming Laboratory
	U24IT3L2	Data Science Laboratory
	U24CS401	Theory of Computation
	U24CS403	Database Management Systems
	U24CS405	Introduction to Operating Systems
	U24CS402	Foundations of Artificial Intelligence and Machine Learning
	U24IT401	Web Essentials
	U24CS4L1	Operating Systems Laboratory
	U24CS4L2	Database Management Systems Laboratory
PSO3:	U24ME2L1	Engineering Practices Laboratory
	U24CS2L1	Programming in C Laboratory

	U24IT301	Foundations of Data Science
	U24IT302	Data Structures and Algorithms
	U24CS303	Object Oriented Programming
	U24CS301	Digital Principles and Computer Organization
	U24IT3L1	Data Structures and Algorithms Laboratory
	U24CS3L2	Object Oriented Programming Laboratory
	U24IT3L2	Data Science Laboratory
	U24CS401	Theory of Computation
	U24CS403	Database Management Systems
	U24CS405	Introduction to Operating Systems
	U24CS402	Foundations of Artificial Intelligence and Machine Learning
	U24IT401	Web Essentials
	U24CS4L1	Operating Systems Laboratory
	U24CS4L2	Database Management Systems Laboratory

R2021 - MAPPING OF COURSES WITH PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES

PO Number	List of Courses	
PO1:	HS3152	Professional English – I
	MA3151	Matrices and Calculus
	PH3151	Engineering Physics
	CY3151	Engineering Chemistry
	GE3151	Problem Solving and Python Programming
	GE3171	Problem Solving and Python Programming Laboratory
	BS3171	Physics and Chemistry Laboratory
	GE3172	English Laboratory
	HS3252	Professional English – II
	MA3251	Statistics and Numerical Methods
	PH3256	Physics for Information Science
	BE3251	Basic Electrical and Electronics Engineering
	GE3251	Engineering Graphics
	CS3251	Programming in C
	GE3271	Engineering Practices Laboratory
	CS3271	Programming in C Laboratory
	GE3272	Communication Laboratory / Foreign Language
	MA3354	Discrete Mathematics
	CS3351	Digital Principles and Computer Organization
	CS3352	Foundations of Data Science
	CD3291	Data Structures and Algorithms
	CS3391	Object Oriented Programming
	CD3281	Data Structures and Algorithms Laboratory
	CS3381	Object Oriented Programming Laboratory
	CS3361	Data Science Laboratory
	GE3361	Professional Development
	CS3452	Theory of Computation
	CS3491	Artificial Intelligence and Machine Learning
	CS3492	Database Management Systems
	IT3401	Web Essentials
	CS3451	Introduction to Operating Systems
	GE3451	Environmental Sciences and Sustainability
	CS3461	Operating Systems Laboratory
	CS3481	Database Management Systems Laboratory

	CS3591 Computer Networks IT3501 Full Stack Web Development CS3551 Distributed Computing CS3691 Embedded Systems and IoT IT3511 Full Stack Web Development Laboratory CCS356 Object Oriented Software Engineering IT3681 Mobile Applications Development Laboratory GE3791 Human Values and Ethics IT3711 Summer Internship IT3811 Project Work / Internship Professional Elective I - CCS366: Software Testing and Automation Professional Elective II - CCS331: 3D Printing and Design Professional Elective III - CCS335: Cloud Computing Professional Elective IV - CCS372: Virtualization Professional Elective V - CCS370: UI and UX Design Professional Elective VI - CCS365: Software Defined Networks Open Elective I - OEE351: Renewable Energy Systems Open Elective II - AI3021: IT in Agricultural Systems Open Elective III - OME352: Additive Manufacturing Open Elective IV - AU3008: Sensors and Actuators
PO2:	HS3152 Professional English – I MA3151 Matrices and Calculus PH3151 Engineering Physics CY3151 Engineering Chemistry GE3151 Problem Solving and Python Programming GE3171 Problem Solving and Python Programming Laboratory BS3171 Physics and Chemistry Laboratory GE3172 English Laboratory HS3252 Professional English – II MA3251 Statistics and Numerical Methods PH3256 Physics for Information Science BE3251 Basic Electrical and Electronics Engineering GE3251 Engineering Graphics CS3251 Programming in C GE3271 Engineering Practices Laboratory CS3271 Programming in C Laboratory GE3272 Communication Laboratory / Foreign Language MA3354 Discrete Mathematics CS3351 Digital Principles and Computer Organization CS3352 Foundations of Data Science CD3291 Data Structures and Algorithms CS3391 Object Oriented Programming CD3281 Data Structures and Algorithms Laboratory CS3381 Object Oriented Programming Laboratory CS3361 Data Science Laboratory CS3452 Theory of Computation CS3491 Artificial Intelligence and Machine Learning CS3492 Database Management Systems IT3401 Web Essentials CS3451 Introduction to Operating Systems CS3461 Operating Systems Laboratory CS3481 Database Management Systems Laboratory CS3591 Computer Networks IT3501 Full Stack Web Development CS3551 Distributed Computing

	CS3691 Embedded Systems and IoT IT3511 Full Stack Web Development Laboratory CCS356 Object Oriented Software Engineering IT3681 Mobile Applications Development Laboratory Professional Elective I - CCS366: Software Testing and Automation Professional Elective II - CCS331: 3D Printing and Design Professional Elective III - CCS335: Cloud Computing Professional Elective IV - CCS372: Virtualization Professional Elective V - CCS370: UI and UX Design Professional Elective VI - CCS365: Software Defined Networks Open Elective I - OEE351: Renewable Energy Systems Open Elective II - AI3021: IT in Agricultural Systems Open Elective III - OME352: Additive Manufacturing Open Elective IV - AU3008: Sensors and Actuators
PO3:	HS3152 Professional English – I MA3151 Matrices and Calculus PH3151 Engineering Physics CY3151 Engineering Chemistry GE3151 Problem Solving and Python Programming GE3171 Problem Solving and Python Programming Laboratory BS3171 Physics and Chemistry Laboratory GE3172 English Laboratory HS3252 Professional English – II MA3251 Statistics and Numerical Methods PH3256 Physics for Information Science BE3251 Basic Electrical and Electronics Engineering GE3251 Engineering Graphics CS3251 Programming in C GE3271 Engineering Practices Laboratory CS3271 Programming in C Laboratory GE3272 Communication Laboratory / Foreign Language MA3354 Discrete Mathematics CS3351 Digital Principles and Computer Organization CS3352 Foundations of Data Science CD3291 Data Structures and Algorithms CS3391 Object Oriented Programming CD3281 Data Structures and Algorithms Laboratory CS3381 Object Oriented Programming Laboratory CS3361 Data Science Laboratory CS3452 Theory of Computation CS3491 Artificial Intelligence and Machine Learning CS3492 Database Management Systems IT3401 Web Essentials CS3451 Introduction to Operating Systems CS3461 Operating Systems Laboratory CS3481 Database Management Systems Laboratory CS3591 Computer Networks IT3501 Full Stack Web Development CS3551 Distributed Computing CS3691 Embedded Systems and IoT IT3511 Full Stack Web Development Laboratory CCS356 Object Oriented Software Engineering IT3681 Mobile Applications Development Laboratory Professional Elective I - CCS366: Software Testing and Automation Professional Elective II - CCS331: 3D Printing and Design

	Professional Elective III - CCS335: Cloud Computing Professional Elective IV - CCS372: Virtualization Professional Elective V - CCS370: UI and UX Design Professional Elective VI - CCS365: Software Defined Networks Open Elective I - OEE351: Renewable Energy Systems Open Elective II - AI3021: IT in Agricultural Systems Open Elective III - OME352: Additive Manufacturing Open Elective IV - AU3008: Sensors and Actuators
PO4:	HS3152 Professional English – I MA3151 Matrices and Calculus PH3151 Engineering Physics CY3151 Engineering Chemistry GE3151 Problem Solving and Python Programming GE3171 Problem Solving and Python Programming Laboratory BS3171 Physics and Chemistry Laboratory GE3172 English Laboratory HS3252 Professional English – II MA3251 Statistics and Numerical Methods PH3256 Physics for Information Science BE3251 Basic Electrical and Electronics Engineering CS3251 Programming in C GE3271 Engineering Practices Laboratory CS3271 Programming in C Laboratory GE3272 Communication Laboratory / Foreign Language MA3354 Discrete Mathematics CS3351 Digital Principles and Computer Organization CS3352 Foundations of Data Science CD3291 Data Structures and Algorithms CS3391 Object Oriented Programming CD3281 Data Structures and Algorithms Laboratory CS3381 Object Oriented Programming Laboratory CS3361 Data Science Laboratory CS3452 Theory of Computation CS3491 Artificial Intelligence and Machine Learning CS3492 Database Management Systems IT3401 Web Essentials CS3451 Introduction to Operating Systems GE3451 Environmental Sciences and Sustainability CS3461 Operating Systems Laboratory CS3481 Database Management Systems Laboratory CS3591 Computer Networks IT3501 Full Stack Web Development CS3551 Distributed Computing CS3691 Embedded Systems and IoT IT3511 Full Stack Web Development Laboratory CCS356 Object Oriented Software Engineering IT3681 Mobile Applications Development Laboratory Professional Elective I - CCS366: Software Testing and Automation Professional Elective II - CCS331: 3D Printing and Design Professional Elective III - CCS335: Cloud Computing Professional Elective IV - CCS372: Virtualization Professional Elective V - CCS370: UI and UX Design Professional Elective VI - CCS365: Software Defined Networks
PO5:	HS3152 Professional English – I MA3151 Matrices and Calculus

	PH3151	Engineering Physics
	CY3151	Engineering Chemistry
	GE3151	Problem Solving and Python Programming
	GE3171	Problem Solving and Python Programming Laboratory
	BS3171	Physics and Chemistry Laboratory
	GE3172	English Laboratory
	HS3252	Professional English – II
	MA3251	Statistics and Numerical Methods
	PH3256	Physics for Information Science
	BE3251	Basic Electrical and Electronics Engineering
	GE3251	Engineering Graphics
	CS3251	Programming in C
	GE3271	Engineering Practices Laboratory
	CS3271	Programming in C Laboratory
	GE3272	Communication Laboratory / Foreign Language
	CS3351	Digital Principles and Computer Organization
	CS3352	Foundations of Data Science
	CD3291	Data Structures and Algorithms
	CS3391	Object Oriented Programming
	CD3281	Data Structures and Algorithms Laboratory
	CS3381	Object Oriented Programming Laboratory
	CS3361	Data Science Laboratory
	GE3361	Professional Development
	CS3452	Theory of Computation
	CS3491	Artificial Intelligence and Machine Learning
	CS3492	Database Management Systems
	IT3401	Web Essentials
	CS3451	Introduction to Operating Systems
	CS3461	Operating Systems Laboratory
	CS3481	Database Management Systems Laboratory
	CS3591	Computer Networks
	IT3501	Full Stack Web Development
	CS3551	Distributed Computing
	CS3691	Embedded Systems and IoT
	IT3511	Full Stack Web Development Laboratory
	CCS356	Object Oriented Software Engineering
	IT3681	Mobile Applications Development Laboratory
	Professional Elective I - CCS366: Software Testing and Automation	
	Professional Elective II - CCS331: 3D Printing and Design	
	Professional Elective III - CCS335: Cloud Computing	
	Professional Elective IV - CCS372: Virtualization	
	Professional Elective V - CCS370: UI and UX Design	
	Professional Elective VI - CCS365: Software Defined Networks	
	Open Elective III - OME352: Additive Manufacturing	
	Open Elective IV - AU3008: Sensors and Actuators	
PO6:	HS3152	Professional English – I
	PH3151	Engineering Physics
	CY3151	Engineering Chemistry
	GE3172	English Laboratory
	HS3252	Professional English – II
	PH3256	Physics for Information Science
	CS3251	Programming in C
	GE3271	Engineering Practices Laboratory
	CS3271	Programming in C Laboratory
	GE3272	Communication Laboratory / Foreign Language

	MA3354 Discrete Mathematics CS3351 Digital Principles and Computer Organization CS3352 Foundations of Data Science GE3361 Professional Development GE3451 Environmental Sciences and Sustainability IT3501 Full Stack Web Development IT3511 Full Stack Web Development Laboratory Open Elective I - OEE351: Renewable Energy Systems Open Elective II - AI3021: IT in Agricultural Systems Open Elective III - OME352: Additive Manufacturing Open Elective IV - AU3008: Sensors and Actuators GE3751 Principles of Management
PO7:	HS3152 Professional English – I CY3151 Engineering Chemistry GE3172 English Laboratory HS3252 Professional English – II PH3256 Physics for Information Science CS3251 Programming in C GE3271 Engineering Practices Laboratory GE3272 Communication Laboratory / Foreign Language CS3351 Digital Principles and Computer Organization CS3352 Foundations of Data Science GE3451 Environmental Sciences and Sustainability IT3501 Full Stack Web Development IT3511 Full Stack Web Development Laboratory Open Elective I - OEE351: Renewable Energy Systems Open Elective II - AI3021: IT in Agricultural Systems
PO8:	HS3152 Professional English – I GE3172 English Laboratory HS3252 Professional English – II CS3251 Programming in C GE3272 Communication Laboratory / Foreign Language CS3351 Digital Principles and Computer Organization CS3452 Theory of Computation IT3501 Full Stack Web Development IT3511 Full Stack Web Development Laboratory GE3791 Human Values and Ethics GE3751 Principles of Management
PO9:	HS3152 Professional English – I MA3151 Matrices and Calculus GE3172 English Laboratory HS3252 Professional English – II MA3251 Statistics and Numerical Methods BE3251 Basic Electrical and Electronics Engineering CS3251 Programming in C GE3272 Communication Laboratory / Foreign Language CS3351 Digital Principles and Computer Organization CS3352 Foundations of Data Science CD3291 Data Structures and Algorithms CS3391 Object Oriented Programming CD3281 Data Structures and Algorithms Laboratory CS3381 Object Oriented Programming Laboratory CS3361 Data Science Laboratory CS3452 Theory of Computation

	CS3491 CS3492 IT3401 CS3451 CS3461 CS3481 IT3501 CS3551 IT3511 CCS356 IT3681 GE3751	Artificial Intelligence and Machine Learning Database Management Systems Web Essentials Introduction to Operating Systems Operating Systems Laboratory Database Management Systems Laboratory Full Stack Web Development Distributed Computing Full Stack Web Development Laboratory Object Oriented Software Engineering Mobile Applications Development Laboratory Principles of Management
PO10:	HS3152 MA3151 GE3172 HS3252 MA3251 CS3251 GE3272 MA3354 CS3351 CS3352 CD3291 CS3391 CD3281 CS3381 CS3361 CS3452 CS3491 CS3492 IT3401 CS3451 CS3461 CS3481 CS3551 IT3511 CCS356 GE3751	Professional English – I Matrices and Calculus English Laboratory Professional English – II Statistics and Numerical Methods Programming in C Communication Laboratory / Foreign Language Discrete Mathematics Digital Principles and Computer Organization Foundations of Data Science Data Structures and Algorithms Object Oriented Programming Data Structures and Algorithms Laboratory Object Oriented Programming Laboratory Data Science Laboratory Theory of Computation Artificial Intelligence and Machine Learning Database Management Systems Web Essentials Introduction to Operating Systems Operating Systems Laboratory Database Management Systems Laboratory Distributed Computing Full Stack Web Development Laboratory Object Oriented Software Engineering Principles of Management
PO11:	HS3152 MA3151 GE3172 HS3252 MA3251 CS3251 GE3272 CS3351 CS3352 CD3291 CS3391 CD3281 CS3381 CS3361 CS3452 CS3491 CS3492	Professional English – I Matrices and Calculus English Laboratory Professional English – II Statistics and Numerical Methods Programming in C Communication Laboratory / Foreign Language Digital Principles and Computer Organization Foundations of Data Science Data Structures and Algorithms Object Oriented Programming Data Structures and Algorithms Laboratory Object Oriented Programming Laboratory Data Science Laboratory Theory of Computation Artificial Intelligence and Machine Learning Database Management Systems

	IT3401	Web Essentials
	CS3451	Introduction to Operating Systems
	CS3461	Operating Systems Laboratory
	CS3481	Database Management Systems Laboratory
	CS3551	Distributed Computing
	IT3511	Full Stack Web Development Laboratory
	CCS356	Object Oriented Software Engineering
	GE3751	Principles of Management
PSO1:	GE3151	Problem Solving and Python Programming
	GE3171	Problem Solving and Python Programming Laboratory
	CS3251	Programming in C
	CS3271	Programming in C Laboratory
	CS3351	Digital Principles and Computer Organization
	CS3352	Foundations of Data Science
	CD3291	Data Structures and Algorithms
	CS3391	Object Oriented Programming
	CD3281	Data Structures and Algorithms Laboratory
	CS3381	Object Oriented Programming Laboratory
	CS3361	Data Science Laboratory
	CS3452	Theory of Computation
	CS3491	Artificial Intelligence and Machine Learning
	CS3492	Database Management Systems
	IT3401	Web Essentials
	CS3451	Introduction to Operating Systems
	CS3461	Operating Systems Laboratory
	CS3481	Database Management Systems Laboratory
	CS3591	Computer Networks
	IT3501	Full Stack Web Development
	CS3551	Distributed Computing
	CS3691	Embedded Systems and IoT
	IT3511	Full Stack Web Development Laboratory
	CCS356	Object Oriented Software Engineering
	IT3681	Mobile Applications Development Laboratory
	Professional Elective I - CCS366: Software Testing and Automation	
	Professional Elective III - CCS335: Cloud Computing	
	Professional Elective IV - CCS372: Virtualization	
	Professional Elective V - CCS370: UI and UX Design	
	Professional Elective VI - CCS365: Software Defined Networks	
PSO2:	GE3151	Problem Solving and Python Programming
	GE3171	Problem Solving and Python Programming Laboratory
	GE3251	Engineering Graphics
	CS3251	Programming in C
	GE3271	Engineering Practices Laboratory
	CS3271	Programming in C Laboratory
	CS3351	Digital Principles and Computer Organization
	CS3352	Foundations of Data Science
	CD3291	Data Structures and Algorithms
	CS3391	Object Oriented Programming
	CD3281	Data Structures and Algorithms Laboratory
	CS3381	Object Oriented Programming Laboratory
	CS3361	Data Science Laboratory
	CS3452	Theory of Computation
	CS3491	Artificial Intelligence and Machine Learning
	CS3492	Database Management Systems
	IT3401	Web Essentials

	CS3451 Introduction to Operating Systems CS3461 Operating Systems Laboratory CS3481 Database Management Systems Laboratory CS3591 Computer Networks IT3501 Full Stack Web Development CS3551 Distributed Computing CS3691 Embedded Systems and IoT IT3511 Full Stack Web Development Laboratory CCS356 Object Oriented Software Engineering IT3681 Mobile Applications Development Laboratory Professional Elective I - CCS366: Software Testing and Automation Professional Elective II - CCS331: 3D Printing and Design Professional Elective III - CCS335: Cloud Computing Professional Elective IV - CCS372: Virtualization Professional Elective V - CCS370: UI and UX Design Professional Elective VI - CCS365: Software Defined Networks
PSO3:	BE3251 Basic Electrical and Electronics Engineering CS3351 Digital Principles and Computer Organization CS3352 Foundations of Data Science CD3291 Data Structures and Algorithms CS3391 Object Oriented Programming CD3281 Data Structures and Algorithms Laboratory CS3381 Object Oriented Programming Laboratory CS3361 Data Science Laboratory CS3452 Theory of Computation CS3491 Artificial Intelligence and Machine Learning CS3492 Database Management Systems IT3401 Web Essentials CS3451 Introduction to Operating Systems CS3461 Operating Systems Laboratory CS3481 Database Management Systems Laboratory CS3591 Computer Networks IT3501 Full Stack Web Development CS3551 Distributed Computing CS3691 Embedded Systems and IoT IT3511 Full Stack Web Development Laboratory CCS356 Object Oriented Software Engineering Professional Elective II - CCS331: 3D Printing and Design Professional Elective III - CCS335: Cloud Computing Professional Elective IV - CCS372: Virtualization Professional Elective VI - CCS365: Software Defined Networks

1.4. Course Outcomes and Course Articulation Matrix (30 Marks)

1.4.1. Course Outcome (Semester Wise) (15 Marks)

Table No. 1.4.1.1: Course outcomes

R2024- COURSE OUTCOMES

Semester No	1
Course Title: Problem Solving and Python Programming	Course Code: U24CS101
Course Outcome No:	Course Outcome Statement
CO1	Develop algorithmic solutions to simple computational problems.
CO2	Develop and execute simple Python programs.
CO3	Write simple Python programs using conditionals and loops for solving problems.
CO4	Decompose a Python program into functions.
CO5	Represent compound data using Python lists, tuples, dictionaries etc. Read and write data from/to files in Python programs
Course Title: Problem Solving and Python Programming Laboratory	Course Code: U24CS1L1
Course Outcome No:	Course Outcome Statement
CO1	Develop algorithmic solutions to simple computational problems
CO2	Develop and execute simple Python programs.
CO3	Implement programs in Python using conditionals and loops for solving problems.
CO4	Deploy functions to decompose a Python program.
CO5	Experiment with compound data using Python data structures & Utilize Python packages in developing software applications.
Semester No	2
Course Title: Programming in C	Course Code: U24CS201
Course Outcome No:	Course Outcome Statement
CO1	Demonstrate knowledge on C Programming constructs
CO2	Develop simple applications in C using basic constructs
CO3	Develop and implement applications using arrays and strings
CO4	Develop and implement modular applications in C using functions
CO5	Showcase applications in C using structures and pointers.
Course Title: Programming in C Laboratory	Course Code: U24CS2L1
Course Outcome No:	Course Outcome Statement
CO1	Demonstrate knowledge on C programming constructs.

CO2	Develop programs in C using basic constructs.
CO3	Develop programs in C using arrays
CO4	Develop applications in C using strings, pointers, functions
CO5	Develop applications in C using structures.
Semester No	3
Course Title: Foundations of Data Science	Course Code: U24IT301
Course Outcome No:	Course Outcome Statement
CO1	Show the understanding of data science fundamentals
CO2	Relate different types of data description for data science process
CO3	Interpret knowledge on relationships between data
CO4	Utilize the Python Libraries for Data Wrangling
CO5	Experiment with visualization Libraries in Python to interpret and explore data
Course Title: Data Structures and Algorithms	Course Code: U24IT302
Course Outcome No:	Course Outcome Statement
CO1	Explain abstract data types
CO2	Utilize and analyze linear data structures, such as lists, queues, and stacks, according to the needs of different applications
CO3	Identify and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting
CO4	Model problems as tree problems
CO5	Implement efficient graph algorithms to solve them
Course Title: Object Oriented Programming	Course Code: U24CS303
Course Outcome No:	Course Outcome Statement
CO1	Apply the concepts of classes and objects to solve simple problems
CO2	Develop programs using inheritance, packages and interfaces
CO3	Make use of exception handling mechanisms and multithreaded model to solve real world problems
CO4	Build Java applications with I/O packages, string classes, Collections and generics concepts
CO5	Integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications
Course Title: Digital Principles and Computer Organization	Course Code: U24CS301
Course Outcome No:	Course Outcome Statement
CO1	Design various combinational digital circuits using logic gates
CO2	Design sequential circuits and analyze the design procedures
CO3	State the fundamentals of computer systems and analyze the execution of an instruction
CO4	Analyze different types of control design and identify hazards

CO5	Identify the characteristics of various memory systems and I/O communication
Course Title: Data Structures and Algorithms Laboratory	Course Code: U24IT3L1
Course Outcome No:	Course Outcome Statement
CO1	Implement ADTs as Python classes
CO2	Implement, and analyse linear data structures, such as lists, queues, and stacks, according to the needs of different applications
CO3	Design, implement, and analyse efficient tree structures to meet requirements such as searching, indexing, and sorting
CO4	Model problems as tree problems and implement efficient graph algorithms to solve them
CO5	Model problems as graph problems and implement efficient graph algorithms to solve them
Course Title: Object Oriented Programming Laboratory	Course Code: U24CS3L2
Course Outcome No:	Course Outcome Statement
CO1	Design and develop java programs using object oriented programming concepts
CO2	Develop simple applications using object oriented concepts such as package, exceptions
CO3	Implement multithreading, and generics concepts
CO4	Create GUIs and event driven programming applications for real world problems
CO5	Implement efficient graph algorithms to solve graph problems
Course Title: Data Science Laboratory	Course Code: U24IT3L2
Course Outcome No:	Course Outcome Statement
CO1	Make use of the python libraries for data science
CO2	Make use of the basic Statistical and Probability measures for data science
CO3	Perform descriptive analytics on the benchmark data sets.
CO4	Perform correlation and regression analytics on standard data sets
CO5	Present and interpret data using visualization packages in Python.
Semester No	4
Course Title: Database Management Systems	Course Code: U24CS403
Course Outcome No:	Course Outcome Statement
CO1	Construct SQL Queries using relational algebra
CO2	Design data base using ER model and normalize the database
CO3	Construct queries to handle transaction processing and maintain consistency of the database

CO4	Compare and contrast various indexing strategies and apply the knowledge to tune the performance of the database
CO5	Appraise how advanced databases differ from Relational Databases and find a suitable database for the given requirement.
Course Title: Introduction to Operating Systems	Course Code: U24CS405
Course Outcome No:	Course Outcome Statement
CO1	Analyze various scheduling algorithms and process synchronization.
CO2	Explain deadlock prevention and avoidance algorithms.
CO3	Compare and contrast various memory management schemes
CO4	Explain the functionality of file systems, I/O systems, and Virtualization
CO5	Compare iOS and Android Operating Systems.
Course Title: Foundations of Artificial Intelligence and Machine Learning	Course Code: U24CS402
Course Outcome No:	Course Outcome Statement
CO1	Use appropriate search algorithms for problem solving
CO2	Apply reasoning under uncertainty
CO3	Build supervised learning models
CO4	Build ensembling and unsupervised models
CO5	Build deep learning neural network models
Course Title: Web Essentials	Course Code: U24IT401
Course Outcome No:	Course Outcome Statement
CO1	Apply JavaScript, HTML and CSS effectively to create interactive and dynamic websites.
CO2	Create simple PHP scripts
CO3	Design and deploy simple web-applications.
CO4	Create simple database applications
CO5	Handle multimedia components
Course Title: Operating Systems Laboratory	Course Code: U24CS4L1
Course Outcome No:	Course Outcome Statement
CO1	To install windows operating systems.
CO2	To understand the basics of Unix command and shell programming.
CO3	To implement various CPU scheduling algorithms.
CO4	To implement Deadlock Avoidance and Deadlock Detection Algorithms
CO5	To implement Page Replacement Algorithms
Course Title: Database Management	Course Code: U24CS4L2

Systems Laboratory	
Course Outcome No:	Course Outcome Statement
CO1	Create databases with different types of key constraints.
CO2	Construct simple and complex SQL queries using DML and DCL commands
CO3	Use advanced features such as stored procedures and triggers and incorporate in GUI based application development
CO4	Create an XML database and validate with meta-data (XML schema).
CO5	Create and manipulate data using NOSQL database.

R2021-COURSE OUTCOMES

Semester No	1
Course Title: PROBLEM SOLVING & PYTHON PROGRAMMING	Course Code: GE3151
Course Outcome No:	Course Outcome Statement
C105.1	Develop algorithmic solutions to simple computational problems.
C105.2	Develop and execute simple Python programs.
C105.3	Write simple Python programs using conditionals and loops for solving problems.
C105.4	Decompose a Python program into functions.
C105.5	Represent compound data using Python lists, tuples, dictionaries, etc.
C105.6	Read and write data from/to files in Python programs.
Course Title: PROBLEM SOLVING & PYTHON PROGRAMMING LAB	Course Code: GE3171
Course Outcome No:	Course Outcome Statement
C107.1	Develop algorithmic solutions to simple computational problems.
C107.2	Develop and execute simple Python programs.
C107.3	Implement programs in Python using conditionals and loops for solving problems.
C107.4	Deploy functions to decompose a Python program.
C107.5	Process compound data using Python data structures.
C107.6	Utilize Python packages in developing software applications.
Semester No	2
Course Title: PROGRAMMING IN C	Course Code: CS3251
Course Outcome No:	Course Outcome Statement
C206.1	Demonstrate knowledge on C Programming constructs.
C206.2	Develop simple applications in C using basic constructs.

C206.3	Design and implement applications using arrays and strings.
C206.4	Develop and implement modular applications in C using functions.
C206.5	Develop applications in C using structures and pointers.
C206.6	Design applications using sequential and random access file processing.
Course Title: PROGRAMMING IN C LABORATORY	Course Code: CS3271
Course Outcome No:	Course Outcome Statement
C209.1	Demonstrate knowledge on C programming constructs.
C209.2	Develop programs in C using basic constructs.
C209.3	Develop programs in C using arrays.
C209.4	Develop applications in C using strings, pointers, functions.
C209.5	Develop applications in C using structures.
C209.6	Develop applications in C using file processing.
Semester No	3
Course Title: DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION	Course Code: CS3351
Course Outcome No:	Course Outcome Statement
C302.1	Design various combinational digital circuits using logic gates
C302.2	Design sequential circuits and analyze the design procedures
C302.3	State the fundamentals of computer systems and analyze the execution of an instruction
C302.4	Analyze different types of control design and identify hazards
C302.5	Identify the characteristics of various memory systems and I/O communication
Course Title: FOUNDATIONS OF DATA SCIENCE	Course Code: CS3352
Course Outcome No:	Course Outcome Statement
C303.1	Define the data science process
C303.2	Understand different types of data description for data science process
C303.3	Gain knowledge on relationships between data
C303.4	Use the Python Libraries for Data Wrangling
C303.5	Apply visualization Libraries in Python to interpret and explore data
Course Title: DATA STRUCTURES AND ALGORITHMS	Course Code: CD3291
Course Outcome No:	Course Outcome Statement
C304.1	Explain abstract data types
C304.2	Design, implement, and analyze linear data structures, such as lists, queues, and stacks, according to the needs of different applications

C304.3	Design, implement, and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting
C304.4	Model problems as graph problems and implement efficient graph algorithms to solve them
Course Title: OBJECT ORIENTED PROGRAMMING	Course Code: CS3391
Course Outcome No:	Course Outcome Statement
C305.1	Apply the concepts of classes and objects to solve simple problems
C305.2	Develop programs using inheritance, packages and interfaces
C305.3	Make use of exception handling mechanisms and multithreaded model to solve real world problems
C305.4	Build Java applications with I/O packages, string classes, Collections and generics concepts
C305.5	Integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications
Course Title: DATA STRUCTURES AND ALGORITHMS LABORATORY	Course Code: CD3281
Course Outcome No:	Course Outcome Statement
C306.1	Implement ADTs as Python classes
C306.2	Design, implement, and analyse linear data structures, such as lists, queues, and stacks, according to the needs of different applications
C306.3	Design, implement, and analyse efficient tree structures to meet requirements such as searching, indexing, and sorting
C306.4	Model problems as graph problems and implement efficient graph algorithms to solve them
Course Title: OBJECT ORIENTED PROGRAMMING LABORATORY	Course Code: CS3381
Course Outcome No:	Course Outcome Statement
C307.1	Design and develop java programs using object-oriented programming concepts
C307.2	Develop simple applications using object-oriented concepts such as package, exceptions
C307.3	Implement multithreading, and generics concepts
C307.4	Create GUIs and event driven programming applications for real world problems
C307.5	Implement and deploy web applications using Java
Course Title: DATA SCIENCE LABORATORY	Course Code: CS3361
Course Outcome No:	Course Outcome Statement
C308.1	Make use of the python libraries for data science

C308.2	Make use of the basic Statistical and Probability measures for data science.
C308.3	Perform descriptive analytics on the benchmark data sets.
C308.4	Perform correlation and regression analytics on standard data sets
C308.5	Present and interpret data using visualization packages in Python.
Semester No	4
Course Title: THEORY OF COMPUTATION	Course Code: CS3452
Course Outcome No:	Course Outcome Statement
C401.1	Construct automata theory using Finite Automata
C401.2	Write regular expressions for any pattern
C401.3	Design context free grammar and Pushdown Automata
C401.4	Design Turing machine for computational functions
C401.5	Differentiate between decidable and undecidable problems
Course Title: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	Course Code: CS3491
Course Outcome No:	Course Outcome Statement
C402.1	Use appropriate search algorithms for problem solving
C402.2	Apply reasoning under uncertainty
C402.3	Build supervised learning models
C402.4	Build ensembling and unsupervised models
C402.5	Build deep learning neural network models
Course Title: DATABASE MANAGEMENT SYSTEMS	Course Code: CS3492
Course Outcome No:	Course Outcome Statement
C403.1	Construct SQL Queries using relational algebra
C403.2	Design database using ER model and normalize the database
C403.3	Construct queries to handle transaction processing and maintain consistency of the database
C403.4	Compare and contrast various indexing strategies and apply the knowledge to tune the performance of the database
C403.5	Appraise how advanced databases differ from Relational Databases and find a suitable database for the given requirement.
Course Title: WEB ESSENTIALS	Course Code: IT3401
Course Outcome No:	Course Outcome Statement
C404.1	Apply JavaScript, HTML and CSS effectively to create interactive and dynamic websites.
C404.2	Create simple PHP scripts
C404.3	Design and deploy simple web-applications.
C404.4	Create simple database applications.
C404.5	Handle multimedia components

Course Title: INTRODUCTION TO OPERATING SYSTEMS	Course Code: CS3451
Course Outcome No:	Course Outcome Statement
C405.1	Analyze various scheduling algorithms and process synchronization.
C405.2	Explain deadlock prevention and avoidance algorithms.
C405.3	Compare and contrast various memory management schemes.
C405.4	Explain the functionality of file systems, I/O systems, and Virtualization
C405.5	Compare iOS and Android Operating Systems.
Course Title: OPERATING SYSTEMS LABORATORY	Course Code: CS3461
Course Outcome No:	Course Outcome Statement
C407.1	Define and implement UNIX Commands.
C407.2	Compare the performance of various CPU Scheduling Algorithms.
C407.3	Compare and contrast various Memory Allocation Methods.
C407.4	Define File Organization and File Allocation Strategies.
C407.5	Implement various Disk Scheduling Algorithms.
Course Title: DATABASE MANAGEMENT SYSTEMS LABORATORY	Course Code: CS3481
Course Outcome No:	Course Outcome Statement
C408.1	Create databases with different types of key constraints.
C408.2	Construct simple and complex SQL queries using DML and DCL commands.
C408.3	Use advanced features such as stored procedures and triggers and incorporate in GUI based application development.
C408.4	Create an XML database and validate with meta-data (XML schema).
C408.5	Create and manipulate data using NOSQL database.
Semester No	5
Course Title: COMPUTER NETWORKS	Course Code: CS3591
Course Outcome No:	Course Outcome Statement
C501.1	Explain the basic layers and its functions in computer networks.
C501.2	Understand the basics of how data flows from one node to another.
C501.3	Analyze routing algorithms.
C501.4	Describe protocols for various functions in the network.
C501.5	Analyze the working of various application layer protocols.
Course Title: FULL STACK WEB DEVELOPMENT	Course Code: IT3501
Course Outcome No:	Course Outcome Statement

C502.1	Understand the various stacks available for web application development
C502.2	Use Node.js for application development
C502.3	Develop applications with MongoDB
C502.4	Use the features of Angular and Express
C502.5	Develop React applications
Course Title: DISTRIBUTED COMPUTING	Course Code: CS3551
Course Outcome No:	Course Outcome Statement
C503.1	Explain the foundations of distributed systems
C503.2	Solve synchronization and state consistency problems
C503.3	Use resource sharing techniques in distributed systems
C503.4	Apply working model of consensus and reliability of distributed systems
C503.5	Explain the fundamentals of cloud computing
Course Title: EMBEDDED SYSTEMS AND IOT	Course Code: CS3691
Course Outcome No:	Course Outcome Statement
C504.1	Explain the architecture of embedded processors.
C504.2	Write embedded C programs.
C504.3	Design simple embedded applications.
C504.4	Compare the communication models in IOT
C504.5	Design IoT applications using Arduino/Raspberry Pi /open platform.
Course Title: SOFTWARE TESTING AND AUTOMATION	Course Code: CCS366
Course Outcome No:	Course Outcome Statement
C505.1	Understand the basic concepts of software testing and the need for software testing
C505.2	Design Test planning and different activities involved in test planning
C505.3	Design effective test cases that can uncover critical defects in the application
C505.4	Carry out advanced types of testing
C505.5	Automate the software testing using Selenium and TestNG
Course Title: 3D PRINTING AND DESGIN	Course Code: CCS331
Course Outcome No:	Course Outcome Statement
C506.1	Outline and examine the basic concepts of 3D printing technology
C506.2	Outline 3D printing workflow`
C506.3	Explain and categorize the concepts and working principles of 3D printing using inkjet technique
C506.4	Explain and categorize the working principles of 3D printing using laser technique
C506.5	Explain various method for designing and modeling for industrial applications

Course Title: FULL STACK WEB DEVELOPMENT LAB	Course Code: IT3511
Course Outcome No:	Course Outcome Statement
C507.1	Design full stack applications with clear understanding of user interface, business logic and data storage.
C507.2	Design and develop user interface screens
C507.3	Implement the functional requirements using appropriate tool
C507.4	Design and develop database based on the requirements
C507.5	Integrate all the necessary components of the application
Semester No	6
Course Title: OBJECT ORIENTED SOFTWARE ENGINEERING	Course Code: CCS356
Course Outcome No:	Course Outcome Statement
C601.1	Compare various Software Development Lifecycle Models
C601.2	Evaluate project management approaches as well as cost and schedule estimation strategies.
C601.3	Perform formal analysis on specifications.
C601.4	Use UML diagrams for analysis and design.
C601.5	Architect and design using architectural styles and design patterns, and test the system
Course Title: CLOUD COMPUTING	Course Code: CCS335
Course Outcome No:	Course Outcome Statement
C603.1	Understand the design challenges in the cloud.
C603.2	Apply the concept of virtualization and its types.
C603.3	Experiment with virtualization of hardware resources and Docker.
C603.4	Develop and deploy services on the cloud and set up a cloud environment.
C603.5	Explain security challenges in the cloud environment.
Course Title: VIRTUALIZATION	Course Code: CCS372
Course Outcome No:	Course Outcome Statement
C604.1	Analyse the virtualization concepts and Hypervisor
C604.2	Apply the Virtualization for real-world applications
C604.3	Install & Configure the different VM platforms
C604.4	Experiment with the VM with various software
Course Title: UI and UX DESIGN	Course Code: CCS370
Course Outcome No:	Course Outcome Statement
C605.1	Build UI for user Applications
C605.2	Evaluate UX design of any product or application
C605.3	Demonstrate UX Skills in product development

C605.4	Implement Sketching principles
C605.5	Create Wireframe and Prototype
Course Title: SOFTWARE DEFINED NETWORKS	Course Code: CCS365
Course Outcome No:	Course Outcome Statement
C606.1	Describe the motivation behind SDN
C606.2	Identify the functions of the data plane and control plane
C606.3	Design and develop network applications using SDN
C606.4	Orchestrate network services using NFV
C606.5	Explain various use cases of SDN and NFV
Course Title: MOBILE APPLICATIONS DEVELOPMENT LABORATORY	Course Code: IT3681
Course Outcome No:	Course Outcome Statement
C607.1	Design and build simple mobile applications supporting multiple platforms.
C607.2	Apply various programming techniques and patterns to build mobile applications.
C607.3	Build real-time mobile applications for society/environment
C607.4	Build gaming and multimedia based mobile applications
C607.5	Build AI based mobile applications for society/environment following ethical practices
Semester No	7
Course Title: IT IN AGRICULTURE SYSTEMS	Course Code: AI3021
Course Outcome No:	Course Outcome Statement
C703.1	The students shall be able to understand the applications of IT in remote sensing applications such as Drones etc.
C703.2	The students will be able to get a clear understanding of how a greenhouse can be automated and its advantages.
C703.3	The students will be able to apply IT principles and concepts for management of field operations.
C703.4	The students will get an understanding about weather models, their inputs and applications.
C703.5	The students will get an understanding of how IT can be used for e-governance in agriculture.
Semester No	8
Course Title: PROJECT WORK / INTERNSHIP	Course Code: IT3811
Course Outcome No:	Course Outcome Statement
C801.1	Gain Domain knowledge and technical skill set required for solving industry / research problems
C801.2	Provide solution architecture, module level designs, algorithms

C801.3	Implement, test and deploy the solution for the target platform
C801.4	Prepare detailed technical report, demonstrate and present the work

1.4.2. Course Articulation Matrix (15 Marks)

**Table No.1.4.2: Course articulation matrix
R2024 - COURSE ARTICULATION MATRIX**

Course outcomes (COs) code & statements	Program Outcomes (POs)											Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
Course Name: Problem Solving and Python Programming														
Course Code: U24CS101														
CO1	3	3	3	3	2	-	-	-	-	2	2	3	3	-
CO2	3	3	3	3	2	-	-	-	-	2	2	3	-	-
CO3	3	3	3	3	2	-	-	-	-	2	-	3	-	-
CO4	2	2	-	2	2	-	-	-	-	1	-	3	-	-
CO5	1	2	-	-	1	-	-	-	-	1	-	2	-	-
AVG	2	3	3	3	2	-	-	-	-	2	2	3	3	-
Course Name: Problem Solving and Python Programming Laboratory														
Course Code: U24CS1L1														
CO1	3	3	3	3	2	-	-	-	-	2	2	3	3	-
CO2	3	3	3	3	2	-	-	-	-	2	2	3	-	-
CO3	3	3	3	3	2	-	-	-	-	2	-	3	-	-
CO4	2	2	-	2	2	-	-	-	-	1	-	3	-	-
CO5	1	2	-	-	1	-	-	-	-	1	-	2	-	-
AVG	2	3	3	3	2	-	-	-	-	2	2	3	3	-
AVG	-	-	-	-	1	1	2	2	3	1	3	-	-	-
Course Name: Programming in C														
Course code: U24CS201														
CO1	1	2	2	1	2	1	1	2	-	3	2	1	2	-
CO2	2	2	2	1	2	1	1	2	-	3	3	2	2	-
CO3	2	3	2	1	2	1	1	2	-	3	2	2	2	-
CO4	3	2	2	1	3	1	1	2	-	3	3	2	2	-
CO5	2	3	3	1	2	1	1	2	-	3	2	2	3	-
AVG	2	2	2	1	2	1	1	2	-	3	2	2	2	-
Course Name: Programming in C Laboratory														
Course code: U24CS2L1														
CO1	1	3	3	1	1	1	-	2	1	2	2	2	2	2
CO2	2	3	3	2	1	1	-	2	1	2	2	2	3	2
CO3	2	2	2	1	1	2	-	2	-	2	2	3	2	3
CO4	2	2	2	2	1	2	-	3	-	3	3	3	2	3

CO5	2	2	3	2	1	2	-	3	-	3	3	2	3	2
AVG	2	2	3	2	1	2	-	2	1	2	2	2	2	2
Course Name: Foundations of Data Science														
Course code: U24IT301														
CO1	2	2	1	2	2	-	-	1	1	1	2	2	2	2
CO2	2	1	-	1	1	-	-	2	1	1	2	2	3	2
CO3	2	2	1	2	2	1	-	1	2	1	3	2	2	2
CO4	3	2	2	1	2	-	-	1	1	2	2	3	3	3
CO5	2	2	1	2	2	-	-	1	1	1	2	2	2	2
AVG	2	2	1	2	2	1	-	1	1	1	2	2	2	2
Course Name: Data Structures and Algorithms														
Course code: U24IT302														
CO1	1	2	2	3	1	-	-	2	-	2	1	1	1	1
CO2	2	3	2	2	2	-	-	2	-	2	2	3	2	2
CO3	2	2	3	2	3	-	-	3	-	2	2	3	2	2
CO4	3	3	3	3	1	-	-	3	-	2	2	3	2	2
CO5	3	3	3	3	1	-	-	3	-	2	2	3	2	2
AVG	2	3	3	3	2	-	-	3	-	2	2	3	2	2
Course Name: Object Oriented Programming														
Course code: U24CS303														
CO1	1	1	3	1	3	-	-	3	2	2	2	3	1	1
CO2	2	1	3	2	1	-	-	2	1	1	3	3	3	3
CO3	3	3	1	2	2	-	-	3	2	1	2	3	1	1
CO4	3	1	2	2	2	-	-	1	2	1	3	3	1	1
CO5	1	1	2	3	2	-	-	3	2	1	2	3	3	3
AVG	2	1	2	2	2	-	-	2	2	1	2	3	2	2
Course Name: Digital Principles and Computer Organization														
Course code: U24CS301														
CO1	3	3	3	3	3	2	1	1	2	2	3	2	3	3
CO2	3	3	3	3	2	1	1	1	2	2	3	1	2	2
CO3	3	3	3	3	2	2	1	1	2	2	3	2	3	1
CO4	3	3	3	3	1	1	1	1	1	1	2	1	3	1
CO5	3	3	3	3	1	2	1	1	1	1	2	1	2	1
AVG	3	3	3	3	1	2	1	1	1	1	2	1	2	1
Course Name: Data Structures and Algorithms Laboratory														
Course code: U24IT3L1														
CO1	3	2	1	1	1	-	-	2	3	1	2	1	2	1
CO2	3	3	2	-	1	-	-	2	3	1	2	2	2	1
CO3	2	2	2	1	1	-	-	2	3	1	2	1	3	1
CO4	3	1	2	1	1	-	-	2	3	1	2	1	3	1
CO5	3	1	2	1	1	-	-	2	3	1	2	1	3	1
AVG	3	2	2	1	1	-	-	2	3	1	2	1	3	1
Course Name: Object Oriented Programming Laboratory														
Course code: U24CS3L2														
CO1	2	1	2	1	-	-	-	1	2	2	2	1	2	2

CO2	2	1	3	1	-	-	-	2	3	3	2	1	3	3
CO3	2	2	1	2	1	-	-	1	2	1	3	2	3	3
CO4	2	2	1	3	-	-	-	3	1	1	1	2	1	1
CO5	1	3	3	1	3	-	-	1	1	1	1	2	1	1
AVG	2	2	2	2	2	-	-	2	2	2	2	2	2	2
Course Name: Data Science Laboratory														
Course code: U24IT3L2														
CO1	3	2	1	1	-	-	-	1	3	3	3	1	3	2
CO2	3	2	2	3	1	-	-	3	1	3	2	1	3	3
CO3	3	2	1	3	1	-	-	2	1	1	1	3	2	3
CO4	2	3	1	3	-	-	-	2	3	2	3	3	3	1
CO5	1	2	3	1	1	-	-	2	1	3	1	1	3	3
AVG	2	2	2	2	1	-	-	2	2	2	2	2	3	2
Course Name: Theory of Computation														
Course code: U24CS401														
CO1	1	3	2	3	-	-	-	1	1	2	3	1	3	2
CO2	2	2	3	2	1	-	-	3	3	2	3	3	1	2
CO3	2	2	3	2	1	-	-	1	3	1	2	1	2	2
CO4	2	2	2	1	-	-	-	1	3	3	2	1	3	2
CO5	2	2	2	1	1	-	-	1	1	3	2	2	1	3
AVG	2	2	2	2	1	-	-	1	2	2	2	2	2	2
Course Name: Database Management Systems														
Course code: U24CS403														
CO1	2	2	3	2	1	-	-	2	1	1	1	2	1	3
CO2	3	1	1	1	1	-	-	2	3	3	3	3	1	2
CO3	3	2	3	2	1	-	-	2	1	1	2	2	3	3
CO4	1	2	3	2	-	-	-	3	2	3	3	1	2	3
CO5	1	1	3	3	2	-	-	1	3	3	1	2	2	2
AVG	2	2	3	2	1	-	-	2	2	2	2	2	2	3
Course Name: Introduction to Operating Systems														
Course code: U24CS405														
CO1	3	1	2	2	-	-	-	3	2	3	1	1	2	2
CO2	2	2	3	1	1	-	-	2	1	1	2	2	1	2
CO3	1	3	2	2	1	-	-	2	2	1	1	1	2	2
CO4	1	3	3	3	-	-	-	1	2	1	2	1	3	2
CO5	3	1	2	1	1	-	-	3	2	3	2	2	2	1
AVG	2	2	2	2	1	-	-	2	2	2	2	1	2	2
Course Name: Foundations of Artificial Intelligence and Machine Learning														
Course code: U24CS402														
CO1	3	2	3	3	-	-	-	1	3	3	3	1	2	2
CO2	1	1	1	3	1	-	-	1	2	1	3	2	3	2
CO3	2	1	2	1	1	-	-	2	1	1	3	1	1	1
CO4	3	1	3	1	-	-	-	2	1	2	1	2	2	2
CO5	3	1	1	2	2	-	-	3	1	2	3	2	1	2
AVG	2	1	2	2	1	-	-	2	2	2	3	2	2	2

Course Name: Web Essentials Course code: U24IT401														
CO1	3	2	-	-	-	1	-	-	-	-	1	-	1	-
CO2	2	3	-	-	-	1	-	-	-	-	1	-	1	-
CO3	1	2	3	1	-	2	-	-	-	-	-	-	1	1
CO4	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO5	1	1	-	-	-	-	-	-	-	-	-	-	-	-
AVG	3	2	3	1	-	-	-	-	-	-	1	-	1	1
Course Name: Operating Systems Laboratory Course code: U24CS4L1														
CO1	3	3	3	3	-	-	-	3	1	3	2	2	3	2
CO2	2	2	3	2	2	-	-	1	2	3	3	2	1	2
CO3	3	3	2	1	1	-	-	1	1	1	3	2	3	3
CO4	1	3	3	3	1	-	-	1	1	3	2	3	1	3
CO5	3	2	1	1	1	-	-	2	2	3	1	3	1	2
AVG	2	3	2	2	1	-	-	2	1	3	2	2	2	2
Course Name: Database Management Systems Laboratory Course code: U24CS4L2														
CO1	3	3	3	3	-	-	-	3	1	3	2	2	3	2
CO2	2	2	3	2	2	-	-	1	2	3	3	2	1	2
CO3	3	3	2	1	1	-	-	1	1	1	3	2	3	3
CO4	1	3	3	3	1	-	-	1	1	3	2	3	1	3
CO5	3	2	1	1	1	-	-	2	2	3	1	3	1	2
AVG	2	3	2	2	1	-	-	2	1	3	2	2	2	2

R2021 – COURSE ARTICULATION MATRIX

Course Outcomes (COs) code & Statement	Program Outcomes (POs)											Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
Course Title: PROBLEM SOLVING & PYTHON PROGRAMMING Course Code: GE3151														
C105.1	3	3	3	3	2	-	-	-	-	2	3	-	-	-
C105.2	3	3	3	3	2	-	-	-	-	2	3	-	-	-
C105.3	3	3	3	3	2	-	-	-	-	2	3	-	-	-
C105.4	2	2	-	2	2	-	-	-	-	1	3	-	-	-
C105.5	1	2	-	-	1	-	-	-	-	1	2	-	-	-
C105.6	2	2	-	-	2	-	-	-	-	1	2	-	-	-
Course Title: PROBLEM SOLVING & PYTHON PROGRAMMING LAB Course Code: GE3171														
C107.1	3	3	3	3	2	-	-	-	-	2	3	-	-	-
C107.2	3	3	3	3	2	-	-	-	-	2	3	-	-	-

C107.3	3	3	3	3	2	-	-	-	-	2	3	-	-	-
C107.4	2	2	-	2	2	-	-	-	-	1	3	-	-	-
C107.5	1	2	-	-	1	-	-	-	-	1	2	-	-	-
C107.6	2	2	-	-	2	-	-	-	-	1	2	-	-	-
Course Title: PROGRAMMING IN C														
Course Code: CS3251														
C206.1	1	2	2	1	2	1	1	2	-	3	2	-	-	-
C206.2	2	2	2	1	2	1	1	2	-	3	3	-	-	-
C206.3	2	3	2	1	2	1	1	2	-	3	2	-	-	-
C206.4	3	2	2	1	3	1	1	2	-	3	3	-	-	-
C206.5	2	3	3	1	2	2	1	2	-	3	2	-	-	-
Course Title: PROGRAMMING IN C LABORATORY														
Course Code: CS3271														
C209.1	1	3	3	1	1	1	-	2	1	2	2	-	-	-
C209.2	2	3	3	2	1	1	-	2	1	2	2	-	-	-
C209.3	2	2	2	1	1	2	-	2	-	2	2	-	-	-
C209.4	2	2	2	2	1	2	-	3	-	3	3	-	-	-
C209.5	2	2	3	2	3	2	-	3	-	3	3	-	-	-
Course Title: DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION														
Course Code: CS3351														
C302.1	3	3	3	3	3	2	1	1	1	2	3	2	3	-
C302.2	3	3	3	3	2	1	1	1	1	2	3	1	2	-
C302.3	3	3	3	3	2	2	1	1	1	2	3	2	3	-
C302.4	3	3	3	3	1	1	1	1	1	2	1	3	1	-
C302.5	3	3	3	3	1	2	1	1	1	1	2	1	2	-
Course Title: FOUNDATIONS OF DATA SCIENCE														
Course Code: CS3352														
C303.1	2	2	1	2	2	-	-	-	1	1	1	2	2	2
C303.2	2	1	-	1	1	-	-	-	2	1	1	2	2	3
C303.3	2	2	1	2	2	1	-	1	2	1	3	2	2	3
C303.4	3	2	2	1	2	-	-	-	1	1	2	2	3	3
C303.5	2	2	1	2	2	-	-	-	1	1	1	2	2	2
Course Title: DATA STRUCTURES AND ALGORITHMS														
Course Code: CD3291														
C304.1	1	2	2	3	1	-	-	-	2	-	2	1	1	1
C304.2	2	3	2	2	2	-	-	-	2	-	2	2	3	2
C304.3	2	2	3	2	3	-	-	-	3	-	2	2	3	2
C304.4	3	3	3	3	1	-	-	-	3	-	2	2	3	2
C304.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Title: OBJECT ORIENTED PROGRAMMING														
Course Code: CS3391														
C305.1	1	1	3	1	3	-	-	3	2	2	2	3	1	2
C305.2	2	1	3	2	1	-	-	2	1	1	3	3	3	2
C305.3	3	3	1	2	2	-	-	3	2	1	2	3	1	3
C305.4	3	1	2	2	2	-	-	1	2	1	3	3	1	1
C305.5	1	1	2	3	2	-	-	3	2	1	2	3	3	3
Course Title: DATA STRUCTURES AND ALGORITHMS LABORATORY														

Course Code: CD3281														
C306.1	3	2	1	1	-	-	-	2	3	1	2	1	2	1
C306.2	3	3	2	-	1	-	-	2	3	1	2	2	2	1
C306.3	2	2	2	1	1	-	-	2	3	1	2	1	3	1
C306.4	3	1	2	1	1	-	-	2	3	1	2	1	3	1
Course Title: OBJECT ORIENTED PROGRAMMING LABORATORY														
Course Code: CS3381														
C307.1	2	1	2	1	-	-	-	1	2	2	2	1	2	3
C307.2	2	1	3	1	-	-	-	2	3	3	2	1	3	1
C307.3	2	2	1	2	1	-	-	1	2	1	3	2	3	2
C307.4	2	2	1	3	-	-	-	3	1	1	1	2	1	2
C307.5	1	3	3	1	3	-	-	1	1	1	1	2	1	2
Course Title: DATA SCIENCE LABORATORY														
Course Code: CS3361														
C308.1	3	2	1	1	-	-	-	1	3	3	3	1	3	2
C308.2	3	2	2	3	1	-	-	3	1	3	2	1	3	3
C308.3	3	2	1	3	1	-	-	2	1	1	1	3	2	3
C308.4	2	3	1	3	-	-	-	2	3	2	3	3	3	1
C308.5	1	2	3	1	1	-	-	2	1	3	1	1	3	3
Course Title: THEORY OF COMPUTATION														
Course Code: CS3452														
C401.1	1	3	2	3	-	-	-	1	1	2	3	1	3	2
C401.2	2	2	3	2	1	-	-	3	3	2	3	3	1	2
C401.3	2	2	3	2	1	-	-	1	3	1	2	1	2	2
C401.4	2	2	2	1	-	-	-	1	3	3	2	1	3	2
C401.5	2	2	2	1	1	-	-	1	1	3	2	3	1	3
Course Title: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING														
Course Code: CS3491														
C402.1	3	2	3	3	-	-	-	1	3	3	3	1	2	2
C402.2	1	1	1	3	1	-	-	1	2	1	3	2	3	2
C402.3	2	1	2	1	1	-	-	2	1	1	3	1	1	1
C402.4	3	1	3	1	-	-	-	2	1	2	1	2	2	2
C402.5	3	1	1	2	2	-	-	3	1	2	3	2	1	2
Course Title: DATABASE MANAGEMENT SYSTEMS														
Course Code: CS3492														
C403.1	2	2	3	2	1	-	-	2	1	1	1	2	1	3
C403.2	3	1	1	1	1	-	-	2	3	3	3	3	1	2
C403.3	3	2	3	2	1	-	-	2	1	1	2	2	3	3
C403.4	1	2	3	2	-	-	-	3	2	3	3	1	2	3
C403.5	1	1	3	3	2	-	-	1	3	3	1	2	2	2
Course Title: WEB ESSENTIALS														
Course Code: IT3401														
C404.1	3	2	3	2	3	2	-	2	2	2	3	3	2	1
C404.2	3	3	3	3	3	2	-	2	0	2	3	3	2	1
C404.3	3	3	3	2	3	2	-	2	2	2	3	3	2	1
C404.4	3	3	3	3	3	1	-	1	1	2	3	3	2	1
C404.5	3	3	3	3	3	1	-	-	-	2	3	3	2	1

Course Title: INTRODUCTION TO OPERATING SYSTEMS															
Course Code: CS3451															
C405.1	3	1	2	2	–	–	–	3	2	3	1	1	2	2	
C405.2	2	2	3	1	1	–	–	2	1	1	2	2	1	2	
C405.3	1	3	2	2	1	–	–	2	2	1	1	1	2	2	
C405.4	1	3	3	3	–	–	–	1	2	1	2	1	3	2	
C405.5	3	1	2	1	1	–	–	3	2	3	2	2	2	1	
Course Title: OPERATING SYSTEMS LABORATORY															
Course Code: CS3461															
C407.1	3	1	3	1	1	–	–	1	3	3	3	2	1	3	
C407.2	3	1	1	2	2	–	–	3	2	1	1	3	1	2	
C407.3	3	3	2	1	2	–	–	3	3	1	2	2	2	2	
C407.4	1	2	2	3	2	–	–	3	1	3	1	1	2	1	
C407.5	2	2	1	1	3	–	–	1	2	2	3	1	3	3	
Course Title: DATABASE MANAGEMENT SYSTEMS LABORATORY															
Course Code: CS3481															
C408.1	3	3	3	3	–	–	–	3	1	3	2	2	3	2	
C408.2	2	2	3	2	2	–	–	1	2	3	3	2	1	2	
C408.3	3	3	2	1	1	–	–	1	1	1	3	2	3	3	
C408.4	1	3	3	3	1	–	–	1	1	3	2	3	1	3	
C408.5	3	2	1	1	1	–	–	2	2	3	1	3	1	2	
Course Title: COMPUTER NETWORKS															
Course Code: CS3591															
C501.1	–	2	–	–	–	–	–	–	–	–	–	3	–	–	
C501.2	–	1	–	–	2	–	–	–	–	–	–	2	–	2	
C501.3	–	2	–	–	3	–	–	–	–	–	–	–	–	3	
C501.4	–	–	–	1	2	–	–	–	–	–	–	–	–	–	
C501.5	–	3	2	–	–	–	–	–	–	–	–	–	–	3	
Course Title: FULL STACK WEB DEVELOPMENT															
Course Code: IT3501															
C502.1	3	2	–	–	–	–	–	1	1	1	1	1	1	–	
C502.2	3	3	3	3	2	1	–	2	–	2	3	2	2	1	
C502.3	3	3	2	2	2	2	–	2	2	2	3	2	2	1	
C502.4	3	3	2	2	2	1	–	1	1	2	2	2	2	1	
C502.5	3	3	3	3	3	1	–	–	–	2	2	2	2	1	
Course Title: DISTRIBUTED COMPUTING															
Course Code: CS3551															
C503.1	2	3	3	1	–	–	2	1	3	3	2	1	1	1	
C503.2	1	3	2	1	2	–	–	2	2	2	2	1	3	2	
C503.3	2	2	1	3	3	–	–	3	2	1	1	1	2	1	
C503.4	1	2	2	3	1	–	–	3	3	2	1	3	1	1	
C503.5	3	3	1	2	3	–	–	3	3	3	1	3	2	3	
Course Title: EMBEDDED SYSTEMS AND IOT															
Course Code: CS3691															
C504.1	3	3	3	3	–	–	–	1	2	3	3	2	1	3	
C504.2	2	1	3	2	2	–	–	1	2	2	3	3	1	3	
C504.3	3	1	3	3	1	–	–	1	2	1	1	1	3	3	

C504.4	3	2	3	2	1	–	–	1	2	2	3	2	2	1
C504.5	2	3	3	2	2	–	–	1	3	3	2	3	1	3
Course Title: SOFTWARE TESTING AND AUTOMATION														
Course Code: CCS366														
C505.1	3	3	2	1	2	-	-	-	1	1	3	2	3	2
C505.2	2	3	1	1	1	-	-	-	2	2	1	2	1	2
C505.3	2	2	1	3	1	-	-	-	1	3	1	2	2	3
C505.4	2	1	3	2	1	-	-	-	1	1	1	2	3	1
C505.5	2	2	1	3	1	-	-	-	1	3	2	1	2	1
Course Title: FULL STACK WEB DEVELOPMENT LAB														
Course Code: IT3511														
C507.1	3	3	3	1	3	1	1	2	1	1	1	2	2	1
C507.2	3	3	3	2	3	1	1	2	1	1	1	2	2	1
C507.3	3	3	3	3	3	1	1	2	1	1	1	2	2	1
C507.4	3	3	3	3	3	2	1	1	1	2	1	1	2	1
C507.5	3	3	3	3	2	1	1	1	1	1	1	2	2	1
Course Title: OBJECT ORIENTED SOFTWARE ENGINEERING														
Course Code: CCS356														
C601.1	2	2	1	2	2	–	–	–	1	1	2	2	1	-
C601.2	2	3	2	3	2	–	–	2	2	3	2	3	2	1
C601.3	2	3	2	1	1	–	–	2	2	3	2	2	3	1
C601.4	2	3	2	2	3	–	–	2	2	3	2	2	3	1
C601.5	2	3	1	2	2	–	–	–	–	1	3	2	2	2
Course Title: CLOUD COMPUTING														
Course Code: CCS335														
C603.1	3	2	1	1	–	–	–	2	3	1	3	2	1	3
C603.2	3	1	2	2	1	–	–	1	2	1	3	2	2	1
C603.3	2	3	2	3	1	–	–	3	1	1	3	1	1	1
C603.4	1	2	3	3	3	–	–	3	3	1	2	1	3	3
C603.5	2	3	3	1	3	–	–	2	2	1	2	2	2	3
Course Title: VIRTUALIZATION														
Course Code: CCS372														
C604.1	1	3	1	3	2	-	-	1	1	3	1	2	3	2
C604.2	3	2	2	1	2	-	-	1	2	2	3	3	2	1
C604.3	3	2	1	3	1	-	-	2	2	1	3	3	3	2
C604.4	1	1	2	3	3	-	-	3	3	1	1	3	2	2
C604.5	1	3	2	3	1	-	-	2	1	3	3	1	1	2
Course Title: UI and UX DESIGN														
Course Code: CCS370														
C605.1	3	1	1	3	1	–	–	3	3	2	1	3	3	1
C605.2	2	3	1	3	2	–	–	1	2	2	2	1	2	2
C605.3	1	3	3	2	2	–	–	2	3	1	2	1	3	3
C605.4	1	2	3	3	1	–	–	3	2	1	3	3	3	3
C605.5	1	2	3	2	1	–	–	2	1	1	1	3	2	2
Course Title: SOFTWARE DEFINED NETWORKS														
Course Code: CCS365														
C606.1	1	2	3	1	3	–	–	2	3	1	3	1	2	1

C606.2	2	1	2	2	3	–	–	2	2	2	2	1	3	2
C606.3	2	2	2	3	3	–	–	3	1	1	2	1	3	3
C606.4	2	2	2	3	1	–	–	1	3	1	2	2	2	2
C606.5	3	3	1	1	3	–	–	1	2	1	2	2	1	3
Course Title: MOBILE APPLICATIONS DEVELOPMENT LABORATORY														
Course Code: IT3681														
C607.1	3	3	3	1	3	1	1	2	1	1	1	2	2	2
C607.2	3	3	3	2	3	1	1	2	1	1	1	2	2	2
C607.3	3	3	3	3	3	3	2	3	3	3	3	3	3	3
C607.4	3	3	3	3	3	2	1	1	1	2	1	1	2	2
C607.5	3	3	3	3	2	1	1	1	1	1	1	2	2	2
Course Title: IT IN AGRICULTURE SYSTEMS														
Course Code: AI3021														
C703.1	2	3	3	2	3	3	3	1	3	3	3	1	1	1
C703.2	3	3	3	3	3	3	3	1	3	3	3	1	1	1
C703.3	2	3	3	2	3	3	2	2	3	3	3	3	2	2
C703.4	3	3	3	1	3	3	3	1	3	3	3	2	2	2
C703.5	2	3	3	2	3	3	3	2	3	3	3	3	3	3
Course Title: PROJECT WORK / INTERNSHIP														
Course Code: IT3811														
C801.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
C801.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
C801.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
C801.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3

1.5. Program Articulation Matrix (5 Marks)

Table No.1.5.1: Program articulation matrix

R2024 - PROGRAM ARTICULATION MATRIX

Course Code	Course Title	Program Outcomes (POs)											Program Specific Outcomes (PSOs)		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
U24EN101	Professional English - I	-	-	-	-	1	1	2	2	3	1	2	-	-	-
U24MA101	Engineering Mathematics - I	3	3	1	1	-	-	-	-	-	-	1	-	-	-
U24PH101	Engineering Physics	3	2	-	1	-	1	-	-	-	-	-	-	-	-
U24CH101	Engineering Chemistry	3	2	-	-	-	2	-	-	-	-	1	-	-	-

U24CS101	Problem Solving and Python Programming	2	3	3	3	2	-	-	-	-	2	2	3	3	-
U24TM101	தமிழர் மரபு / Heritage of Tamils	-	-	-	-	-	3	2	-	-	-	2	-	-	-
U24CS1L1	Problem Solving and Python Programming Laboratory	2	3	3	3	2	-	-	-	-	2	2	3	3	-
U24BS1L1	Physics and Chemistry Laboratory	2	2	1	3	-	-	-	-	-	-	-	-	-	-
U24EN1L1	English Laboratory	-	-	-	-	1	1	2	2	3	1	3	-	-	-
		-	-	-	-	-	2	2	1	2	3	-	-	-	-
U24EN201	Professional English - II	-	-	-	-	1	1	2	2	3	1	3	-	-	-
U24MA201	Engineering Mathematics - II	3	3	1	-	1	-	-	-	-	-	-	-	-	-
U24PH201	Applied Physics	3	2	-	1	-	1	-	-	-	-	-	-	-	-
U24ME201	Engineering Graphics	3	1	2	-	2	-	-	-	3	-	2	2	2	-
U24TM201	தமிழரும் தொழில்நுட்பமும்/ Tamils & Technology	-	-	-	-	-	3	2	-	-	-	2	-	-	-
U24EE203	Basic Electrical and Electronics Engineering	2	2	2	-	-	-	1	-	-	-	1	-	-	-
U24CS201	Programming in C	2	2	2	1	2	1	1	2	-	3	2	2	2	-
U24ME2L1	Engineering Practices Laboratory	3	2	-	-	1	1	-	-	-	-	2	2	1	1
U24EN2L1	Communication Skills Laboratory	-	-	-	-	1	1	2	2	3	1	3	-	-	-
U24CS2L1	Programming in C Laboratory	2	2	3	2	1	2	-	2	1	2	2	2	2	2
U24MC201	Universal Human Values	-	-	-	-	-	-	3	-	-	-	3	-	-	-

U24MA301	Engineering Mathematics - III	3	3	2	-	-	-	-	-	-	-	1	-	-	-
U24IT301	Foundations of Data Science	2	2	1	2	2	1	-	1	1	1	2	2	2	2
U24IT302	Data Structures and Algorithms	2	3	3	3	2	-	-	3	-	2	2	3	2	2
U24CS303	Object Oriented Programming	2	1	2	2	2	-	-	2	2	1	2	3	2	2
U24CS301	Digital Principles and Computer Organization	3	3	3	3	1	2	1	1	1	1	2	1	2	1
U24IT3L1	Data Structures and Algorithms Laboratory	3	2	2	1	1	-	-	2	3	1	2	1	3	1
U24CS3L2	Object Oriented Programming Laboratory	2	2	2	2	2	-	-	2	2	2	2	2	2	2
U24IT3L2	Data Science Laboratory	2	2	2	2	1	-	-	2	2	2	2	2	3	2
U24MC301	Indian Traditional Knowledge	-	-	-	-	-	2	-	-	-	-	2	-	-	-
U24TP301	Career Enhancement Course - I	-	-	-	-	-	3	2	-	-	-	2	-	-	-
U24CS401	Theory of Computation	2	2	2	2	1	-	-	1	2	2	2	2	2	2
U24CS403	Database Management Systems	2	2	3	2	1	-	-	2	2	2	2	2	2	3
U24BS401	Environmental Sciences and Sustainability	-	-	-	-	-	3	2	-	-	-	2	-	-	-

U24CS405	Introduction to Operating Systems	2	2	2	2	1	-	-	2	2	2	2	1	2	2
U24CS402	Foundations of Artificial Intelligence and Machine Learning	2	1	2	2	1	-	-	2	2	2	3	2	2	2
U24IT401	Web Essentials	3	2	3	1	-	-	-	-	-	-	1	-	1	1
U24CS4L1	Operating Systems Laboratory	2	3	2	2	1	-	-	2	1	3	2	2	2	2
U24CS4L2	Database Management Systems Laboratory	2	3	2	2	1	-	-	2	1	3	2	2	2	2
U24MC401	Indian Constitution	-	-	-	-	-	3	2	-	-	-	2	-	-	-
U24TP401	Career Enhancement Course - II	-	2	-	-	-	-	-	-	2	2	3	-	-	-
U24TP402	Microsoft Essentials	-	-	-	-	-	3	2	-	-	-	2	-	-	-
U24CS504	Distributed Computing	3	3	3	2	2	1	1	2	2	1	2	3	2	1
U24IT501	Full Stack Web Development	3	3	3	2	2	1	1	2	2	1	2	3	2	1
U24YYOEX	Open Elective – I	3	3	1	1	-	-	-	-	-	-	1	-	-	-
U24CS501	Computer Networks	3	3	3	2	2	1	1	2	2	1	2	3	2	1
U24CS602	Embedded Systems and IoT	3	3	3	2	2	1	1	2	2	1	2	3	2	1
U24DS503	Big Data Analytics	3	3	3	2	2	1	1	2	2	1	2	3	2	1
U24YYPXX	Professional Elective – I	3	3	3	2	2	1	1	2	2	1	2	3	2	1
U24IT5L1	Full Stack Web Development	2	2	3	2	3	1	1	3	3	2	3	3	2	2
	Laboratory														

U24MC501	Personality Development for Professionals	-	-	-	-	-	3	3	-	-	2	3	1	-	-
U24TP5XX	Technical Training Course - I	3	3	3	3	3	3	3	3	3	3	3	3	3	3
U24YYOEX	Open Elective – II	3	3	1	1	-	-	-	-	-	-	1	-	-	-
U24CS601	Object Oriented Software Engineering	3	3	3	2	2	1	1	2	2	1	2	3	2	1
U24IT601	DevOps	3	3	3	2	2	1	1	2	2	1	2	3	2	1
U24YYPXX	Professional Elective – II	3	3	3	2	2	1	1	2	2	1	2	3	2	1
U24MC601	Creativity, Innovation and Entrepreneurship	3	3	2	3	2	3	3	3	2	2	2	1	1	1
U24EM601	Mini Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3
U24TP6XX	Technical Training Course - II	3	3	3	3	3	3	3	3	3	3	3	3	3	3
U24BA701	Professional Ethics and Managerial Skills	1	1	2	1	1	3	3	3	3	2	3	2	1	1
U24YYOEX	Open Elective – III	3	3	1	1	-	-	-	-	-	-	1	-	-	-
U24YYOEX	Open Elective – IV	3	3	1	1	-	-	-	-	-	-	1	-	-	-
U24YYPXX	Professional Elective – III	3	3	3	2	2	1	1	2	2	1	2	3	2	1
U24YYPXX	Professional Elective – IV	3	3	3	2	2	1	1	2	2	1	2	3	2	1
U24EM701	Internship	3	3	3	3	3	3	3	3	3	3	3	3	3	3
U24EM801	Project Work	3	3	3	3	3	3	3	3	3	3	3	3	3	3

R2021 - PROGRAM ARTICULATION MATRIX

Course Code	Course Title	Program Outcomes (POs)											Program Specific Outcomes (PSOs)		
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
HS3152 C101	Professional English - I	1.6	2.2	1.8	2.2	1.5	3	3	1.6	3	3	3	-	-	-
MA3151 C102	Matrices and Calculus	3	3	1	1	0	0	0	2	0	2	3	-	-	-
PH3151 C103	Engineering Physics	3	3	1.6	1.2	1.8	1	-	-	-	-	1	-	-	-
CY3151 C104	Engineering Chemistry	2.8	1.3	1.6	1	-	1.8	-	-	-	-	1.5	-	-	-
GE3151 C105	Problem Solving and Python Programming	2	3	3	3	2	-	-	-	2	2	3	3	-	-
GE3152 C106	Heritage of Tamils	-	-	-	-	-	3	2	-	-	-	2	-	-	-
GE3171 C107	Problem Solving and Python Programming Laboratory	2	3	3	3	2	-	-	-	2	2	3	3	-	-
BS3171 C108	Physics and Chemistry Laboratory- <i>Physics Lab</i>	3	2.4	2.6	1	1	-	-	-	-	-	-	-	-	-
	<i>Chemistry Lab</i>	2.6	1.3	1.6	1	1	1.8	-	-	-	-	-	-	-	-
GE3172 C109	English Laboratory	3	3	3	3	1	3	3	3	3	3	3	-	-	-
HS3252 C201	Professional English - II	3	3	3	3	2.8	3	3	2.2	3	3	3	-	-	-
MA3251 C202	Statistics and Numerical Methods	3	3	1	1	1	0	0	2	0	2	3	-	-	-
PH3256 C203	Physics for Information Science	3	1.3	2	1.3	2.3	1.3	-	-	-	-	2	-	-	-

BE3251	Basic Electrical and Electronics Engineering	2	1.8	1	-	-	-	1	-	-	-	2	-	-	-
C204															
GE3251	Engineering Graphics	3	1	2	-	2	-	-	-	3	-	2	-	-	-
C205															
CS3251	Programming in C	2	2	2	1	2	1	1	2	-	3	2	-	-	-
C206															
GE3252	Tamils and Technology	-	-	-	-	-	3	2	-	-	-	2	-	-	-
C207															
GE3271	Engineering Practices Laboratory	3	2	-	-	1	1	-	-	-	-	2	-	-	-
C208															
CS3271	Programming in C Laboratory	2	2	3	2	1	2	-	2	1	2	2	-	-	-
C209															
GE3272	Communication Laboratory / Foreign Language	2.4	2.8	3	3	1.8	3	3	3	3	3	-	-	-	-
C210															
MA3354	Discrete Mathematics	1	3	2	1	-	-	-	-	-	-	-	-	-	-
C301															
CS3351	Digital Principles and Computer Organization	3	3	3	3	1.8	1.6	1	1	1.6	2.6	1.3	-	-	-
C302															
CS3352	Foundations of Data Science	2	2	1	2	2	1	-	1	1	1	3	-	-	-
C303															
CD3291	Data Structures	2	2	1	2	2	1	-	1	1	1	3	-	-	-
C304															
CS3391	Object Oriented Programming	2	1	2	2	2	-	2	2	1	2	3	-	-	-
C305															
CD3281	Data Structures Laboratory	2	2	2	1	2	-	2	2	2	2	2	-	-	-
C306															
CS3381	Object Oriented Programming Laboratory	2	2	2	2	2	-	2	2	2	2	2	-	-	-
C307															
CS3361	Data Science Laboratory	2	2	2	2	1	-	2	2	2	2	2	2	2	-
C308															

GE3361	Professional Development	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-
C309																
CS3452	Theory of Computation	2	2	2	2	1	-	1	2	2	2	-	-	-	-	
C401																
CS3491	Artificial Intelligence and Machine Learning	2	1	2	2	1	-	2	2	2	2	2	2	1	-	
C402																
CS3492	Database Management Systems	2	2	3	2	1	-	2	2	2	2	2	2	2	-	
C403																
IT3401	Web essentials	2.7	1.8	3	1	-	1.3	-	-	-	-	3	-	-		
C404																
CS3451	Introduction to Operating Systems	2	2	2	2	1	-	2	2	2	2	-	-	-	2	
C405																
GE3451	Environmental Sciences and Sustainability	2.8	1.8	1	1	-	2.4	-	-	-	1.8	1.4	2.6	1.6	-	
C406																
CS3461	Operating Systems Laboratory	2	2	2	2	-	-	2	2	2	2	2	2	2	-	
C407																
CS3481	Database Management Systems Laboratory	2	3	2	2	1	-	2	1	3	2	2	2	2	-	
C408																
CS3591	Computer Networks	-	1	-	-	1	-	-	1	-	-	3	2	2	-	
C501																
IT3501	Full Stack Web Development	3	3	3	2	3	1	1	1	1	1	2	2	3	-	
C502																
CS3551	Distributed Computing	1.8	2.4	1.8	2.4	2	-	-	2.6	2.2	2.2	2	2	2	1.8	
C503																
CS3691	Embedded Systems and IoT	2.6	2	3	2.4	1.5	-	-	1	2.2	2.2	2	2	3	1.6	
C504																
CCS366	Professional Elective I - Software testing and automation	2.2	2.2	1.6	2	1.2	-	-	-	1.2	2	-	-	-	2.2	
C505																
CCS331	Professional Elective II - 3D printing and Design	1.8	2	2.4	2.4	2.8	2	-	2.4	-	2.4	2	2	2	2.4	
C506																

IT3511	Full Stack Web Development Laboratory	3	3	3	2	3	1	1	1	1	1	2	2	2	1
C507															
CCS356	Object Oriented Software Engineering	2	2	1	2	2	-	-	-	1	1	2	2	3	2
C601															
OEE351	Open Elective – I* - Renewable Energy Systems	3	2	-	-	-	-	-	-	-	2	1	1	1	3
C602															
CCS335	Professional Elective III -Cloud computing	2.2	2.2	2.2	2	1.8	-	-	2.2	2.2	1	2.6	1.6	1.8	2.2
C603															
CCS372	Professional Elective IV - Virtualization	1.8	2.2	1.6	2.6	1.8	-	-	1.8	1.8	2	2.2	2.4	2.2	1.8
C604															
CCS370	Professional Elective V - UI/UX Design	1.6	2.2	2.2	2.6	1.4	-	-	2.2	2.2	1.4	1.8	2.2	2.6	2.2
C605															
CCS365	Professional Elective VI - Software Defined Networks	2	2	2	2	2.6	-	-	1.8	2.2	1.2	2.2	1.4	2.2	2.2
C606															
IT3681	Mobile Applications Development Laboratory	3	3	3	2	1	1	1	1	1	1	1	2	2	2
C607															
GE3791	Human Values and Ethics	-	-	-	-	-	-	3	-	-	-	3	-	-	3
C701															
GE3751	Elective - Management# - Principles of Management	1.7	1	1	1.5	1.5	1	1	2	3	1	1	1.5	1	1.3
C702															
AI3021	Open Elective – II** - IT in Agriculture Systems	2	3	3	2	3	3	3	1	3	3	3	2	2	2
C703															

OME352	Open Elective – III** - Additive Manufacturing	3	2	2	2	2	1	1	-	1	1	1	1	2	-
C704															
AU3008	Open Elective – IV** - Sensors and Actuators	3	2	2	2	2	1	1	-	1	1	1	1	2	3
C705															
IT3711	Summer Internship	3	2	2	2	2	2	2	-	1	2	2	1	2	3
C706															
IT3681	Project Work Internship	3	3	3	3	3	3	3	3	3	3	3	3	3	3
C801															