

**Study Scheme: Five-Year Integrated M.
Tech. Programme
(2025 Batch onwards)**

**Five-Year Integrated M. Tech. in Computer
Science and Engineering**

Study Scheme and Syllabus for Five-Year Integrated M. Tech. Programme in Computer Science and Engineering

Vision & Mission of Department

Vision

To achieve technical & research excellence in the field of Computer Science and Engineering with industrial & social perspective.

Mission

- To provide environment for imparting high quality technical education, skill development, research and development.
- To disseminate sound knowledge of recent Computer Technologies by organizing seminar/workshops/short-term courses.
- To develop interaction and collaboration with the industry.
- To facilitate Hand-on training to the students for promoting Self-Employment.

**Study Scheme and Syllabus for Five-Year Integrated M. Tech. Programme in
Computer Science and Engineering**

Program Outcomes (PO's) – For Semesters I to VIII

- 1) **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2) **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3) **Design / Development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4) **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5) **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6) **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7) **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8) **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9) **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10) **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Study Scheme and Syllabus for Five-Year Integrated M. Tech. Programme in Computer Science and Engineering

- 11)Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12)Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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**Program Specific Outcomes (PSO's) – For Semesters I to
VIII**

- 1) **Program Specific Outcome (PSO) 1:** The ability to understand, analyse and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.
- 2) **Program Specific Outcome (PSO) 2:** The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, lifelong learning and a zest for higher studies and also to act as a good citizen by inculcating in them moral values & ethics.

Study Scheme and Syllabus for Five-Year Integrated M. Tech. Programme in Computer Science and Engineering

Program Outcomes (POs) – For Semesters IX and X

1. **Scholarship of Knowledge:** Acquire in-depth knowledge of specific discipline or professional area, including wider and global perspective, with an ability to discriminate, evaluate, analyse, and synthesise existing and new knowledge, and integration of the same for enhancement of knowledge.
2. **Critical Thinking:** Analyse complex engineering problems critically, apply independent judgement for synthesising information to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy context.
3. **Problem Solving:** Think laterally and originally, conceptualise, and solve engineering problems, evaluate a wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering public health and safety, cultural, societal, and environmental factors in the core areas of expertise.
4. **Research Skill:** Extract information pertinent to unfamiliar problems through literature survey and experiments, apply appropriate research methodologies, techniques and tools, design, conduct experiments, analyse, and interpret data, demonstrate higher order skill and view things in a broader perspective, contribute individually/in group(s) to the development of scientific/technological knowledge in one or more domains of engineering.
5. **Usage of modern tools:** Create, select, learn, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities with an understanding of the limitations.
6. **Collaborative and Multidisciplinary work:** Possess knowledge and understanding of group dynamics, recognise opportunities and contribute positively to collaborative-multidisciplinary scientific research, demonstrate a capacity for self-management and teamwork, decision-making based on open-mindedness, objectivity, and rational analysis in order to achieve common goals and further the learning of themselves as well as others.
7. **Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply the same to one's own work,

Study Scheme and Syllabus for Five-Year Integrated M. Tech. Programme in Computer Science and Engineering

as a member and leader in a team, manage projects efficiently in respective disciplines and multidisciplinary environments after consideration of economical and financial factors.

8. **Communication:** Communicate with the engineering community, and with society at large, regarding complex engineering activities confidently and effectively, such as, being able to comprehend and write effective reports and design documentation by adhering to appropriate standards, make effective presentations, and give and receive clear instructions.

9. **Life-long Learning:** Recognise the need for and have the preparation and ability to engage in life-long learning independently, with a high level of enthusiasm and commitment to improve knowledge and competence continuously.

10. **Ethical Practices and Social Responsibility:** Acquire professional and intellectual integrity, professional code of conduct, ethics of research and scholarship, consideration of the impact of research outcomes on professional practices and an understanding of responsibility to contribute to the community for sustainable development of society.

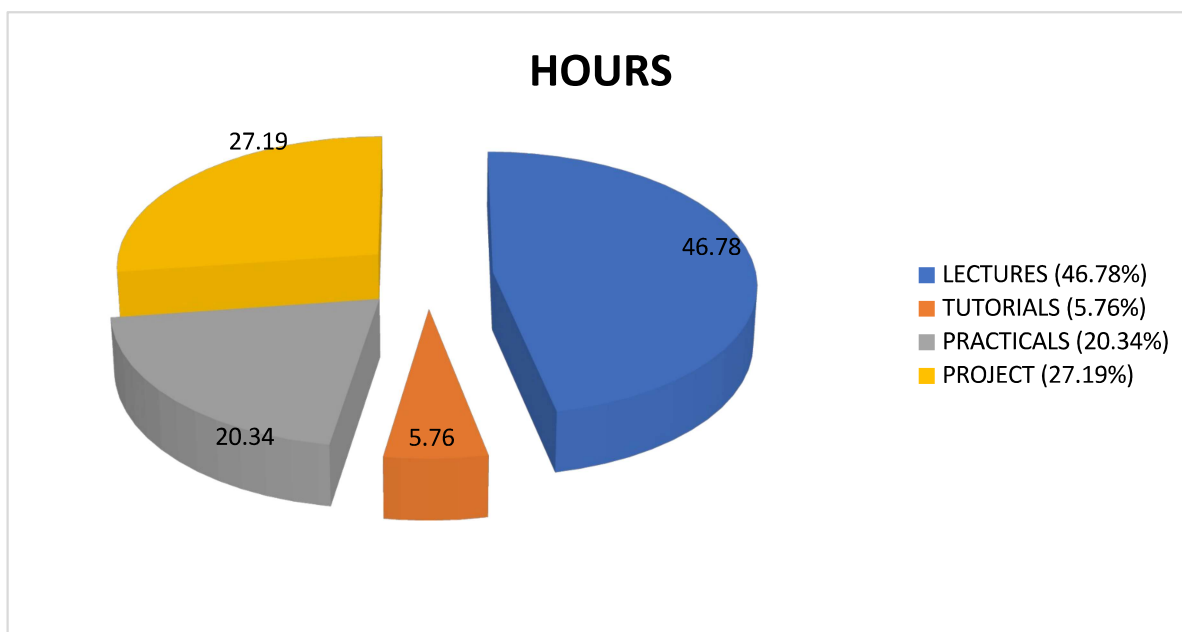
11. **Independent and Reflective Learning:** Observe and examine critically the outcomes of one's actions and make corrective measures subsequently and learn from mistakes without depending on external feedback.

**Study Scheme and Syllabus for Five-Year Integrated M. Tech. Programme in
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**Program Specific Outcomes (PSO's) – For Semesters IX and
X**

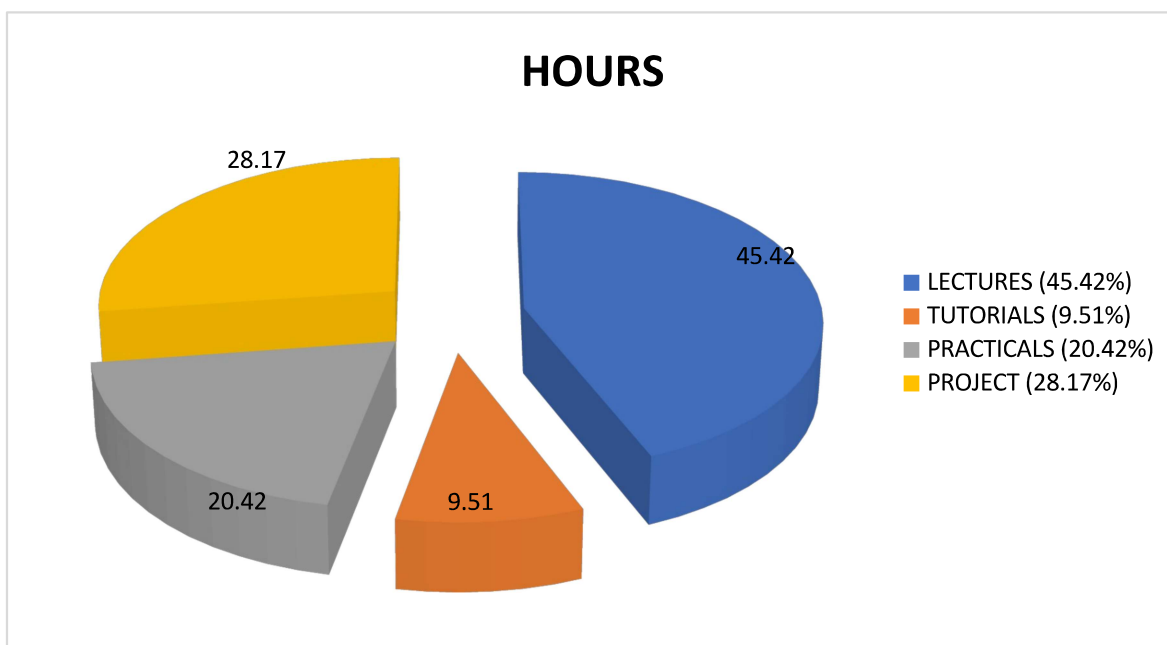
- 1) Program Specific Outcome (PSO) 1:** The ability to take up higher studies, research, and development in modern computing environment.
- 2) Program Specific Outcome (PSO) 2:** The ability to apply mathematical foundation, algorithmic principles, comprehend the technical advancements, and use research-based knowledge for modelling and simulation of the problems.

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CONTACT HOURS DISTRIBUTION (IMCS)



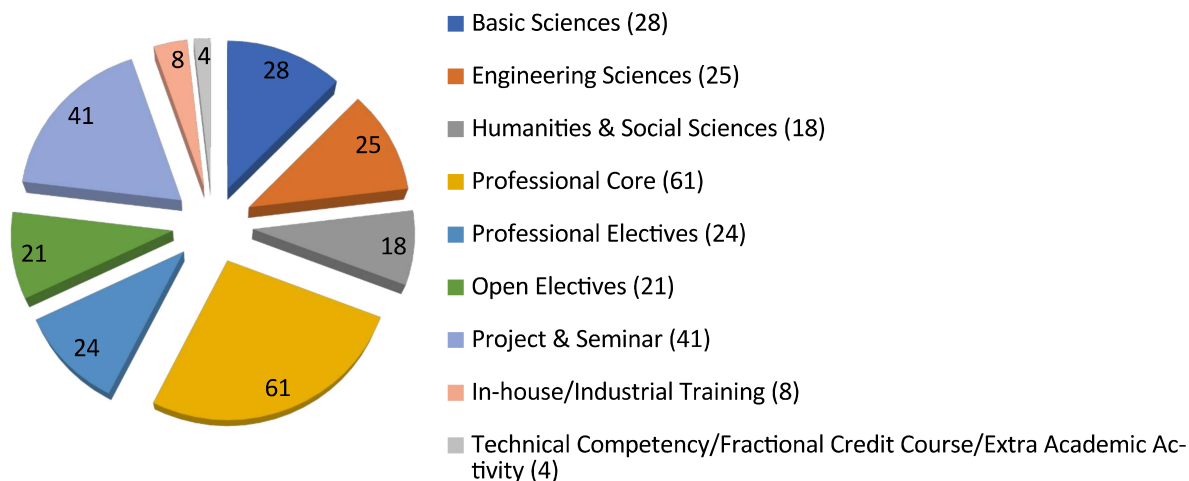
**CONTACT HOURS DISTRIBUTION (IMCS) OPTING INTERNSHIP IN
INDUSTRY**



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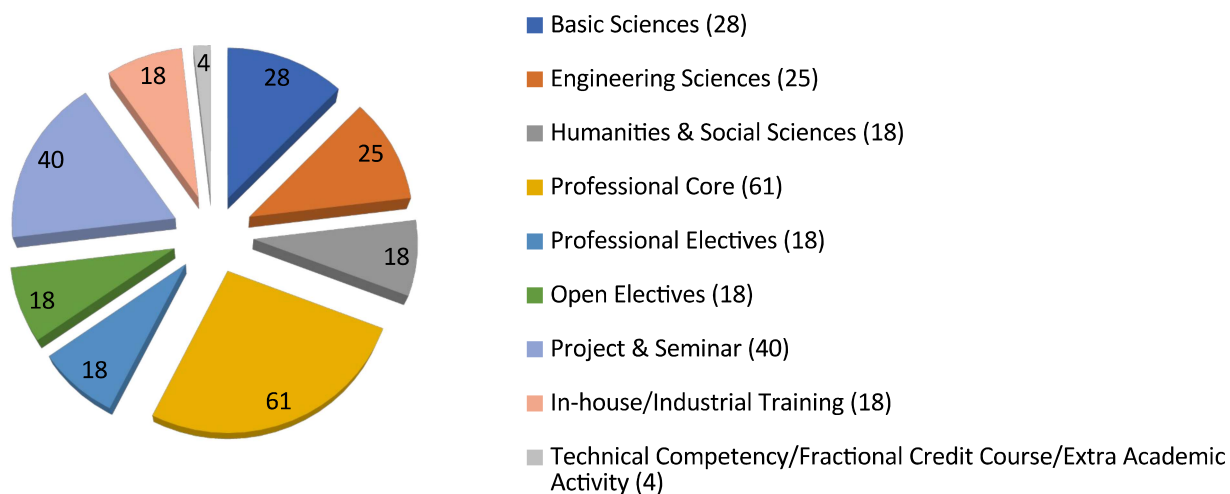
DISTRIBUTION OF COURSE CREDITS (IMCS)

CREDITS-230



DISTRIBUTION OF COURSE CREDITS (IMCS) OPTING INTERNSHIP IN INDUSTRY

CREDITS-230



Study Scheme and Syllabus for Five-Year Integrated M. Tech. Programme in Computer Science and Engineering

Semester-I							
S No	Sub Code	Subject Name	L	T	P	Hr s.	Credits
1	BSMA-401	Engineering Mathematics I	3	1	0	4	4
2	BSPH-401	Applied Physics	3	1	0	4	4
3	ESEE-401	Elements of Electrical Engineering	2	1	0	3	3
4	ESCS-401	Elements of Computer Engineering	2	0	0	2	2
5	ESEC-401	Elements of Electronics Engineering	2	0	0	2	2
6	BSPH-402	Applied Physics Lab	0	0	2	2	1
7	ESEE-402	Elements of Electrical Engineering Lab	0	0	2	2	1
8	ESCS-402	Elements of Computer Engineering Lab	0	0	4	4	2
9	ESEC-402	Elements of Electronics Engineering Lab	0	0	2	2	1
		Total	12	3	10	25	20
Total credits at the end of Semester I: 20							
Semester-II A							
S No	Sub Code	Subject Name	L	T	P	Hr s.	Credits
1	BSMA-402	Engineering Mathematics II	3	1	0	4	4
2	BSCH-401	Applied Chemistry	3	1	0	4	4
3	ESME-401	Elements of Mechanical Engineering	2	1	0	3	3
4	ESME-402	Workshop Technology and Practice	1	0	0	1	1
5	HSMC-401	English Communication and Soft Skills	1	0	0	1	1
6	BSCH-402	Applied Chemistry Lab	0	0	2	2	1
7	ESME-403	Elements of Mechanical Engineering Lab	0	0	2	2	1
8	ESME-404	Engineering Drawing	0	0	4	4	2
9	ESME-405	Workshop Technology and Practice Lab	0	0	4	4	2
10	HSMC-402	English Communication and Soft Skills Lab	0	0	2	2	1
11	MCCH-401	Environmental Studies	3	0	0	3	0 (S/US)
		Total	13	3	14	30	20
Semester-II B							
1	TPIN-421	Practical Training During Summer Vacations (In-house) 02 weeks				40	1 (S/US)
2	TPIN-422	Technical Competency				40	1 (S/US)
Total credits at the end of Semester II: 42							
Semester-III							
S No	Sub Code	Subject Name	L	T	P	Hr s.	Credits
1	BSMA-501	Numerical and Statistical Methods	3	0	0	3	3
2	BSBL-501	Biology for Engineers	2	0	0	2	2
3	PCCS-551	Digital Electronics	3	1	0	4	4
4	PCCS-552	Object Oriented Programming	3	1	0	4	4
5	PCCS-553	Discrete Mathematics	3	1	0	4	4
6	MCUG-501	Universal Human Values-II: Understanding Harmony	3	0	0	3	3

Study Scheme and Syllabus for Five-Year Integrated M. Tech. Programme in Computer Science and Engineering

7	BSMA-502	Numerical and Statistical Methods Lab	0	0	2	2	1
8	PCCS-554	Digital Electronics Lab	0	0	2	2	1
9	PCCS-555	Object Oriented Programming Lab	0	0	2	2	1
		Total	17	3	6	26	23
Total credits at the end of Semester III: 65							

Semester-IV A

S No	Sub Code	Subject Name	L	T	P	Hr s.	Credits
1	ESME-501	Engineering Mechanics	3	1	0	4	4
2	PCCS-561	Computer Organization and Architecture	3	1	0	4	4
3	PCCS-562	Operating Systems	3	0	0	3	3
4	PCCS-563	Data Structures and Algorithms	3	1	0	4	4
5	HSMC-501	Principles of Management	3	0	0	3	3
6	PCCS-564	Operating Systems Lab	0	0	2	2	1
7	PCCS-565	Data Structures and Algorithms Lab	0	0	2	2	1
8	MCMH-501	Indian Constitution	3	0	0	3	0 (S/US)
		Total	18	3	4	25	20

Semester-IV B

1	TPID-521	Academic Research Internship/ Industrial Training (02 weeks)				80	1 (S/US)
2	EAA-521+	Fractional credit course/Extra Academic Activity + GROUP A/B/C				40	1 (S/US)
Total credits at the end of Semester IV: 87							