School of Computer & Information Sciences

Integrated MTech (Computer Science Engineering)

Curriculum (w. e. f: 2024-25)

SCHOOL OF COMPUTER & INFORMATION SCIENCES

Vision Statement:

- To invent, create and bring computing technology solutions to the common man, to the privileged and underprivileged sections of India, to bridge the digital divide and eradication of computer ignorance and digital illiteracy and to build a prosperous and technologically advanced nation.

Mission Statements:

MS-1: To pursue academic and research excellence, nationally and internationally

MS-2: To provide training, advisory, and consultancy to all the stakeholders.

MS-3: To lead the efforts in creative and newer modes of instruction delivery & supervision

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Name of the Academic Program: Integrated MTech (Computer Science and Engineering)

Program Educational Objectives (PEOs)

PEO-1: To produce graduates with strong foundational concepts, techniques and tools to enable them to be pursue higher studies.

PEO-2: To prepare students to apply engineering knowledge to solve problems in computer science and other fields.

PEO-3: To produce graduates with strong human values and professional ethics

PEO-4: Produce Post graduates who can contribute to the Research & Development effectively

PEO-5: To provide students a deep insight into cutting edge technologies and tools.

PEO-6: To create globally competent technocrats with exposure to Scientific & Engineering aspects of development

PEO-7: To work collaboratively on multi-disciplinary projects and exhibit high levels of professional & ethical values

PEO-8: Create awareness of societal problems and its impact

Note: ***PEO-1 to PEO-3 applies to I. MTech I-VI and PEO-4 to PEO-8 applies to I. MTech VII-X***

Mapping Program Educational Objectives (PEOs) with Mission Statements (MS)

	MS – 1	MS – 2	MS – 3
PEO – 1	3	2	
PEO – 2	3		2
PEO – 3	2		3
PEO – 4	3	2	1
PEO – 5	2	3	1
PEO – 6	3	2	1
PEO – 7	2	1	3
PEO – 8	1	2	3

'3' – 'High-level' Mapping; '2' – 'Medium-level' Mapping; '1' – 'Low-level' Mapping

Name of the Academic Program: Integrated M.Tech (Computer Science and Engineering) I-VI

Program Outcomes (POs)

PO-1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and engineering specialization to the solution of the complex engineering problems.

PO-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.

PO-3: Design/Development of Solutions: Design solutions for complex engineering problems and design system component or processes that meets the specified needs with appropriate consideration for the public health and safety, and the cultural societal and environmental considerations.

PO-4: Conduct Investigation of Complex Problems: Use research-based knowledge and research methods including designs of experiments, analysis, and interpretation of data and synthesis of the information to provide valid conclusions

PO-5: Model tool Usage: Create, select, and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of limitations.

PO-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 professional engineering practice

PO-7: Environmental and sustainability: Understand the impact of the professional engineering solutions in societal and environmental context, and demonstrate the knowledge of, and need for sustainable development.

PO-8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice

PO-9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-10: Communication: Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend ad write the effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO-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 a leader in a team, to manage projects and in multidisciplinary environments

PO-12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Mapping of Program Outcomes (POs) and Program Specific Outcomes (PSOs) with Program Educational Objectives (PEOs)

	PEO-1	**PEO-2**	**PEO-3**
PO-1	2	3	1
PO-2	3	2	1
PO-3	1	3	2
PO-4	1	3	2
PO-5	2	3	1
PO-6	3	2	1
PO-7	1	2	3
PO-8	2	1	3
PO-9	1	2	3
PO-10	3	1	2
PO-11	1	2	3
PO-12	3	1	2

Mapping of Program Specific Outcomes (PSOs) where applicable.

Write '3' in the box for 'high-level' mapping, 2 for 'Medium-level' mapping, 1 for 'Low-level' mapping.

School of Computer & Information Sciences

Integrated M.Tech (CSE)

Student Induction Program: Starts with three weeks SIP that includes Universal Human Values – 1 (0 credits) before regular Classes.

SEMESTER – I				
Course Title	**Credits**	**Type of Subject (AICTE)**	**Type of Subject (UoH NEP)**	**Offering Academic Unit**
English	3	HSMC	HSC	CELS
Engineering Mathematics – I	3	BSC	SSC	School of Mathematics & Statistics
Engineering Physics – I	3	BSC	SSC	SEST
Problem Solving and Programming	3	ESC	DSC	SCIS
Problem Solving and Programming Lab	2	ESC	DSC	SCIS
Principles of Engineering and Sustainability	4	ESC	SSC	SEST
Basic Engineering Laboratory – I	2	ESC	SSC	SEST & SCIS
GEC – I (At least 2 Credits)	2		GEC	
Total Credits, Sem – I = 22				
SEMESTER – II				
Course Title	**Credits**	**Type of Subject (AICTE)**	**Type of Subject (UoH NEP)**	**Offering Academic Unit**
Discrete Mathematics	3	BSC	SSC	SEST
Engineering Physics – II	3	BSC	SSC	SEST
Engineering Mathematics – II	3	BSC	SSC	School of Mathematics & Statistics
Creativity and Innovation	3	EEC	OE	SEST
Data and File Structures	3	PCC	DSC	SCIS
Data and File Structures Lab	2	PCC	DSC	SCIS
Engineering Drawing	2	ESC	SSC	SEST
GEC – II (At least 2 Credits)	2		GEC	
Total Credits, Sem – II = 21		**Cumulative Credits at the end of Semester – II = 43**		

SEMESTER – III				
Course Title	**Credits**	**Type of Subject (AICTE)**	**Type of Subject (UoH NEP)**	**Offering Academic Unit**
Introduction to Public Health	3	HSMC	HSC	
Information Theory	3	PCC	DSC	SCIS
Electronic Devices & Circuits	3	ESC	SSC	SCIS
Object Oriented Programming	3	PCC	DSC	SCIS
Skill Development	3	EEC	FSE	SCIS
Object Oriented Programming Lab	1.5	PCC	DSC	SCIS
Electronic Devices & Circuits Lab	1.5	ESC	SSC	SCIS
Computer Organization & Architecture	4	PCC	DSC	SCIS
Total Credits, Sem – III = 22		**Cumulative Credits at the end of Semester – III = 65**		
SEMESTER – IV				
Course Title	**Credits**	**Type of Subject (AICTE)**	**Type of Subject (UoH NEP)**	**Offering Academic Unit**
Computer Based Numerical & Optimization Techniques	3	BSC	SSC	SCIS
Computer Based Numerical & Optimization Techniques Lab	2	BSC	SSC	SCIS
Data Base Management Systems	3	PCC	DSC	SCIS
Data Base Management Systems Lab	2	PCC	DSC	SCIS
UHV-II	3	MC		
Theory of Computation	3	PCC	DSC	SCIS
Environmental Sciences	1	MC		
Constitution of India	1	MC		
Open Elective-I(Other Schools/Swayam)	3	OEC	OE	
Total Credits, Sem – IV = 21		**Cumulative Credits at the end of Semester – IV = 86**		

SEMESTER – V				
Course Title	**Credits**	**Type of Subject (AICTE)**	**Type of Subject (UoH NEP)**	**Offering Academic Unit**
Accounting and Financial Management	3	HSMC	HSC	
Operating Systems	3	PCC	DSC	SCIS
Computer Networks	4	PCC	DSC	SCIS
Algorithms	4	PCC	DSC	SCIS
Elective-I	4	PEC	SSE	SCIS
Operating Systems Lab	2	PCC	DSC	SCIS
Computer Networks Lab	2	PCC	DSC	SCIS
Total Credits, Sem – V = 22		**Cumulative Credits at the end of Semester – V = 108**		
SEMESTER – VI				
Course Title	**Credits**	**Type of Subject (AICTE)**	**Type of Subject (UoH NEP)**	**Offering Academic Unit**
Compiler Design	3	PCC	DSC	SCIS
Software Engineering	3	PCC	DSC	SCIS
Internet Technologies	3	PCC	DSC	SCIS
Humanities-I (Applied Linguistics, etc.)	3	HSMC	HSC	
Essentials of AI	4	PCC	DSC	SCIS
Software Engineering Lab	2	PCC	DSC	SCIS
Internet Technologies Lab	2	PCC	DSC	SCIS
Total Credits, Sem – VI = 20		**Cumulative Credits at the end of Semester – VI = 128**		
SUMMER INTERNESHIP		**Credits = 3**		
SEMESTER – VII				
Course Title	**Credits**	**Type of Subject (AICTE)**	**Type of Subject (UoH NEP)**	**Offering Academic Unit**
Machine Learning	3	PCC	DSC	SCIS
Software Project Management	3	HSMC	HSC	SCIS
Elective-II	4	PCE	SSE	SCIS
Elective-III	4	PCE	SSE	SCIS
Cyber Security	3	PCC	DSC	SCIS
Machine Learning Lab	2	PCC	DSC	SCIS
Total Credits, Sem – VII (inc. Internship) = 22		**Cumulative Credits at the end of Semester – VII = 150**		

SEMESTER – VIII				
Course Title	**Credits**	**Type of Subject (AICTE)**	**Type of Subject (UoH NEP)**	**Offering Academic Unit**
Open Elective-II(Swayam/HCU)	3	OEC	OE	
Open Elective-III(Swayam/HCU)	3	OEC	OE	
Elective-IV	4	PEC	SSE	SCIS
Elective-V	4	PEC	SSE	SCIS
Pattern Recognition	4	PCC	DSC	SCIS
Advanced Algorithms	4	PCC	DSC	SCIS
Total Credits, Sem – VIII = 22		**Cumulative Credits at the end of Semester – VIII = 172**		
SEMESTER – VIII (B. TECH EXIT)				
Course Title	**Credits**	**Type of Subject (AICTE)**	**Type of Subject (UoH NEP)**	**Offering Academic Unit**
Open Elective-II(Swayam/HCU)	3	OEC	OE	
Open Elective-III(Swayam/HCU)	3	OEC	OE	
Project	12	EEC	RI	
Total Credits, Sem – VIII = 18		**Cumulative Credits at the end of Semester – VIII = 168**		
SEMESTER – IX				
Course Title	**Credits**	**Type of Subject (AICTE)**	**Type of Subject (UoH NEP)**	**Offering Academic Unit**
Research Methods (Swayam/HCU)	3	HSMC	HSC	
Open Elective-IV(Swayam/HCU)	3	OEC	OE	
Disertation-1/Industrial Project	10	EEC	RI	
Total Credits, Sem – IX = 16		**Cumulative Credits at the end of Semester – IX = 188**		
SEMESTER – X				
Course Title	**Credits**	**Type of Subject (AICTE)**	**Type of Subject (UoH NEP)**	**Offering Academic Unit**
Disertation-2/Industrial Project	16	EEC	RI	
Total Credits, Sem – X = 16		**Cumulative Credits at the end of Semester – X = 204**		