

DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE CURRICULUM OF B.TECH. (INFORMATION TECHNOLOGY) CURRICULUM [III, IV, V, VI, VII & VIII SEMESTERS] (As per National Education Policy-2020)

APPLICABLE FOR 2022 ENTRY BATCH ONWARDS



SMIT SIKKIM
MANIPAL
UNIVERSITY
SIKKIM MANIPAL INSTITUTE OF TECHNOLOGY

**DEPARTMENT OF INFORMATION TECHNOLOGY
SIKKIM MANIPAL INSTITUTE OF TECHNOLOGY
MAJHITAR, RANGPO**

SIKKIM MANIPAL UNIVERSITY

VISION

- Global Leadership in Human Development, Excellence in Education and Healthcare.

MISSION

- Develop professionals of excellent technical calibre in the field of Health Sciences, Engineering, Management and Social Sciences with a humane approach capable of shouldering the responsibility of building the nation and be globally competent.

OBJECTIVES

- To support, promote and undertake the advancement of academics
- To promote use of ICT and modern education technologies
- To encourage research, creation and dissemination of knowledge
- To facilitate extension and community service
- To empower people of Sikkim and contribute to human development in Northeast
- To create environmental and social responsibilities among students and employees
- To ensure steady growth of the University

SIKKIM MANIPAL INSTITUTE OF TECHNOLOGY (SMIT)

VISION

- To achieve eminence in the field of quality technological education and research.

MISSION

- To develop SMIT into an institute of excellence capable of producing competent techno-managers who can contribute effectively to the advancement of the society.

OBJECTIVES

- To provide wholesome education to meet the intellectual aspirations of the students.
- To equip students with techno-managerial skills to enable them to take their assigned role in the industry.
- To inculcate essential ethics and values to meet the spiritual needs to the students.
- To provide a sound institutional environment nurturing emotional strength, healthy mind, body and resilience amongst the students.

DEPARTMENT OF INFORMATION TECHNOLOGY, SMIT

VISION

- To become a front-runner in preparing students equipped with attributes like efficient problem solvers, innovators, researchers and entrepreneurs, and in making them academia and industry ready.

MISSION

- To offer high-quality undergraduate program namely Bachelor of Technology in Information Technology incorporating latest developments in the area of Information and Communication Technology into the curriculum, along with doctoral program.
- To produce competent technocrats and researchers in order to meet the human resource needs of industries, government sectors, and the society as a whole.
- To offer a conducive academic environment to the students where creativity flourishes.
- To teach students how to think in order to become an efficient problem solver.

PROGRAM OUTCOMES (POs) OF BACHELOR OF TECHNOLOGY

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyse 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 components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 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.
PO 5	Modern 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 the 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 the professional engineering practice.
PO 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.
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 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.
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 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 life-long learning in the broadest context of technological change.

PROGRAM EDUCATIONAL OBJECTIVES (PEO) OF BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY

- To improve the employability of students and prepare them for better employment.
- To motivate students for higher education and research.
- To encourage students for becoming future entrepreneur and provide them an ecosystem for the same.
- To inculcate professional ethics in students and prepare them to become professionals driven by value system.

PROGRAM SPECIFIC OUTCOMES (PSO) OF BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY

1. Students will be equipped with skills and competency to work and deliver quality results in industries, research organizations, and in the professional world as a whole.
2. Students will be competent to develop software solutions for different relevant problems in the world of Information and Communication, by applying knowledge of various domains such as Database Technologies, Information Systems, Network Technologies, Cloud Technologies, Algorithms, Artificial Intelligence, Machine Learning, Cyber Security, Image Processing, and associated interdisciplinary subjects.

DEPARTMENT OF INFORMATION TECHNOLOGY**III SEMESTER****Schema**

Sl./no	Sub. Code	Subject Name	Teaching Dept.	No. of hours/week			Total Credits
				Lecture	Tutorial	Practical	
1	MA10113A	Engineering Mathematics-III	Maths	2	1	0	3
2	IT10130A	Core Theory-1: Data Structure	IT	3	1	0	4
3	IT10131A	Core Theory-2: Digital Circuits and Logic Design	IT	3	1	0	4
4	IT10132A	Core Theory-3: Python Programming	IT	3	0	0	3
5	IT10133A	Core Theory-4: Numerical Techniques	IT	3	0	0	3
6	IT10134A	Core Theory-5: Computer Organization and Architecture	IT	3	0	0	3
7	IT10430A	Lab-1: Data Structure Lab	IT	0	0	2	1
8	IT10431A	Lab-2: Digital Circuits and Logic Design lab	IT	0	0	2	1
9	IT10501A	Project Based Learning- I	IT	0	0	2	1
				17	3	6	23
	Total Contact Hours (L + T + P)		Total	26			

Prof. (Dr.) K. Sharma
(Member, BoS)

Prof. (Dr.) S. Bora
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(Chairman, BoS)

Dr. B. Bhuyan
(Member, BoS)

Mr. D. Baruah
(Member)

Ms. C. Chakraborty
(Member)

DEPARTMENT OF INFORMATION TECHNOLOGY**IV SEMESTER****Schema**

Sl/no	Sub. Code	Subject Name	Teaching Dept.	No. of hours/week			Total Credits
				Lecture	Tutorial	Practical	
1	MA10114A	Engineering Mathematics-IV	Maths	2	1	0	3
2	IT10140A	Core Theory-6: Object Oriented Programming using C++	IT	3	1	0	4
3	IT10141A	Core Theory-7: Database Management Systems	IT	3	0	0	3
4	IT10142A	Core Theory-8: Formal Language and Automata	IT	3	0	0	3
5	IT1031*A	Program Elective-1(+MOOC Based)	IT	3	0	0	3
6	IT1021*A	Open Elective-1(+MOOC Based)/NCC	IT	3	0	0	3
7	GN10101A	UHV-II	IT	3	0	0	3
8	IT10440A	Lab-3: Object Oriented Programming using C++ Lab	IT	0	0	2	1
9	IT10441A	Lab-4: Database Management Systems Lab	IT	0	0	2	1
10	IT10502A	Project Based Learning- II	IT	0	0	2	1
				20	2	6	25
	Total Contact Hours (L + T + P)+ OE			25+3=28			

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Programme Elective-I

IT10310A Simulation and Modelling

IT10311A Information Systems and Security

IT10312A Computer Graphics

IT10313A Microprocessors

Open Elective-I

IT10210A Management Information Systems

IT10211A Geographical Information Systems

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DEPARTMENT OF INFORMATION TECHNOLOGY**V SEMESTER****Schema**

Sl. No	Subject Code	Subject Name	Teaching Dept.	No. of hours/week			Total Credits
				Lecture	Tutorial	Practical	
1	GN10103A	Professional Communication and Technical Writing	IT	1	0	0	1
2	IT10150A	Core Theory-9: Design and Analysis of Algorithms	IT	3	0	0	3
3	IT10151A	Core Theory-10: Operating Systems	IT	3	0	0	3
4	IT10152A	Core Theory-11: Data Communication	IT	3	0	0	3
5	IT1032*A	Program Elective-2 (+MOOC Based)	IT	3	0	0	3
6	IT1022*A	Open Elective-2 (+MOOC Based)/NCC	IT	3	0	0	3
7	GN10102A	Behaviour Management and Leadership	SMU	3	0	0	3
8	IT10451A	Lab-5: Operating Systems Lab	IT	0	0	2	1
9	IT10452A	Lab-6: Java Programming Lab	IT	0	0	2	1
10	IT10503A	Project-Based Learning - III	IT	0	0	2	1
11	IT10901A	Industrial Training-I	IT	0	0	2	1
			Total	19	0	8	23
	Total Contact Hours (L + T + P) + OE			24+3=27			

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Programme Elective-II

IT10320A Artificial Intelligence

IT10321A Cloud Computing

IT10322A Microcontrollers

IT10323A Information System Management

IT10324A Information Theory

Open Elective - II

IT10220A Introduction to Artificial Intelligence

IT10221A Enterprise Resource Planning

IT10222A Communication Techniques

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DEPARTMENT OF INFORMATION TECHNOLOGY**VI SEMESTER****Schema**

Sl./No.	Sub. Code	Subject Name	Teaching Dept.	No. of hours/week			Total Credits
				Lecture	Tutorial	Practical	
1	BA10146A	Industrial Management	MGMT.	2	0	0	2
2	IT10160A	Core Theory-12: Computer Networks	IT	3	0	0	3
3	IT10161A	Core Theory-13: Web Technology and Web Services	IT	3	0	0	3
4	IT10162A	Core Theory-14: Software Engineering	IT	3	0	0	3
5	IT1033*A	Program Elective-3 (+MOOC Based)	IT	3	0	0	3
6	IT1034*A	Program Elective-4 ((+MOOC Based)	IT	3	0	0	3
7	IT1023*A	Open Elective- 3 (+MOOC Based) /NCC	IT	3	0	0	3
8	GN11001A	Quantitative Aptitude and Logical Reasoning ** (T&P)	T&P	--	--	--	--
9	IT10460A	Lab-7: Computer Networks Lab	IT	0	0	2	1
10	IT10461A	Lab-8: Web Technology and Web Services Lab	IT	0	0	2	1
11	IT10560A	Minor Project	IT	0	0	4	2
			Total	20	0	8	24
	Total Contact Hours (L + T + P) + OE			25+3=28			

**** Optional Audit Course**Prof. (Dr.) K. Sharma
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Program Elective-III

IT10330A Natural Language Processing

IT10331A Digital Image Processing

IT10332A Information Retrieval

IT10333A Fog Computing

IT10334A Wireless Sensor Networks

IT10335A Data Mining

IT10336A Mobile Communication

Program Elective-IV

IT10340A Latest Trends in Information Technology

IT10341A System Programming

IT10342A Bio Inspired Computing

IT10343A Mobile Computing

IT10344A Robotics

IT10345A Real Time Systems

IT10346A Big Data Analytics

IT10347A Machine Learning

Open Elective-III

IT10231A Internet of Things

IT10232A Fundamentals of Machine Learning

IT10233A e-Commerce

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DEPARTMENT OF INFORMATION TECHNOLOGY**VII SEMESTER****Schema**

Sl./No.	Sub. Code	Subject Name	Teaching Dept.	No. of hours/week			Total Credits
				Lecture	Tutorial	Practical	
1	IT1024*A	Open Elective-4((+MOOC Based)	IT	3	0	0	3
2	IT1035*A / IT1036*A	Program Elective5 (+MOOC Based)	IT	3	0	0	3
3	IT10601A	Research based Project / Industrial Project -Phase-I	IT	0	0	14	7
4	IT10920A	Industrial Training-II	IT	0	0	2	1
			Total	6	0	16	14
	Total Contact Hours (L + T + P)+OE			19+3=22			

Program Elective – V

IT10350A	Multimedia Computing and Communications
IT10351A	Cryptography and Network Security
IT10352A	Neural Networks
IT10353A	Pattern Recognition
IT10354A	Web Content Management and Web 3.0
IT10355A	Soft Computing
IT10356A	Distributed Computing
IT10357A	Grid Computing
IT10358A	Cyber Physical Systems
IT10359A	Social Network Analysis

Open Elective IV

IT10240A	Introduction to Soft Computing
IT10241A	Cyber Security
IT10242A	Introduction to e-Governance

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DEPARTMENT OF INFORMATION TECHNOLOGY**VIII SEMESTER****Schema**

Sl. No	Subject Code	Subject	Teaching Dept.	No Of Hours/Week				No of Credits
				Lecture	Tutorial	Practical	TOT	
1	IT10602A	Research based Project / Industrial Project - Phase-II		0	0	24	12	12

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				Lecture	Tutorial	Practical	
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2	IT10130A	Core Theory-1: Data Structure	IT	3	1	0	4
3	IT10131A	Core Theory-2: Digital Circuits and Logic Design	IT	3	1	0	4
4	IT10132A	Core Theory-3: Python Programming	IT	3	0	0	3
5	IT10133A	Core Theory-4: Numerical Techniques	IT	3	0	0	3
6	IT10134A	Core Theory-5: Computer Organization and Architecture	IT	3	0	0	3
7	IT10430A	Lab-1: Data Structure Lab	IT	0	0	2	1
8	IT10431A	Lab-2: Digital Circuits and Logic Design lab	IT	0	0	2	1
9	IT10501A	Project Based Learning- I	IT	0	0	2	1
				17	3	6	23
	Total Contact Hours (L + T + P)		Total	26			