Course Structure

for

4-Years B. Tech. in Computer Science and Engineering

Effective from 2019-2020 Academic Session

Department of Computer Science and Engineering

National Institute of Technology Sikkim

South Sikkim - 737 139

Sl. No.	Subject Code	Subject Name	L-T-P	Credit
		1st Semester		
		Theory Subjects		
1	MA11101	Mathematics I	3-1-0	4
2	PH11101	Engineering Physics	3-0-0	3
3	EE11101	Principles of Electrical Engineering	3-0-0	3
4	CS11101	Computer Programming and Problem Solving	2-0-0	2
5	CS11102	Introduction to Computer Systems	2-0-0	2
6	HS11101	English Language and Literature	2-1-0	3
		Practical and Sessionals		
7	CS11201	Computer Programming Laboratory	0-0-4	2
8	PH11201	Engineering Physics Laboratory	0-0-2	1
9	EE11201	Electrical Workshop	0-0-2	1
10	ME11201	Workshop Practice	0-0-3	2
		Total Credits	**15-2-11**	**23**
		2nd Semester		
		Theory Subjects		
1	MA12101	Mathematics II	3-1-0	4
2	CY12101	Engineering Chemistry	3-0-0	3
3	EC12101	Electronics Devices and Circuits	3-0-0	3
4	CS12101	Foundation of Computing	3-0-0	3
5	CY12102	Health, Safety and Environment	2-0-0	2
6	HS12101	Human Values and Effective Communication	1-2-0	3
		Practical and Sessionals		
7	CY12201	Engineering Chemistry Laboratory	0-0-2	1
8	CS12201	Computing Laboratory	0-0-2	1
9	EC12201	Electronics Workshop	0-0-2	1
10	ME12202	Engineering Graphics	0-0-3	2
11	ZZ12201	Professional Practice I	0-0-2	Audit
12	ZZ12202	Behaviour and Discipline	-	Audit
		Total Credits	**15-3-11**	**23**
		3rd Semester		
		Theory Subjects		
1	CS13101	Data Structure and Algorithms	3-0-0	3
2	CS13102	Data Communication	3-0-0	3
3	CS13103	Digital Logic Design	3-0-0	3
4	CS13104	Object Oriented System Design	3-0-0	3
5	CS13105	Computational Mathematics	3-1-0	4
6	CS13106	Computational Logic	2-0-0	2
		Practical and Sessionals		
7	CS13201	Data Structure and Algorithms Laboratory	0-0-4	2
8	CS13202	Data Communication Laboratory	0-0-2	1
9	CS13203	Digital Logic Design Laboratory	0-0-2	1
10	CS13204	Object Oriented System Design Laboratory	0-0-2	1
11	ZZ13201	Professional Practice II	0-0-2	Audit
		Total Credits	**17-1-12**	**23**

		4th Semester		
		Theory Subjects		
1	CS14101	Computer Networks	3-0-0	3
2	CS14102	Operating System	3-0-0	3
3	CS14103	Design and Analysis of Algorithms	3-0-0	3
4	CS14104	Computer Organization and Architecture	3-0-0	3
5	CS14105	Software Engineering	3-0-0	3
6	CS14106	Microprocessor and Microcontroller	3-0-0	3
		Practical and Sessionals		
7	CS14201	Computer Networks Laboratory	0-0-2	1
8	CS14202	Operating System Laboratory	0-0-2	1
9	CS14203	Design and Analysis of Algorithms Laboratory	0-0-2	1
10	CS14204	Computer System Design Laboratory	0-0-2	1
11	ZZ14201	Professional Practice III	0-0-2	Audit
12	ZZ14202	Behaviour and Discipline	-	Audit
		Total Credits	**18-0-10**	**22**
		5th Semester		
		Theory Subjects		
1	HS15101	Engineering Economics	2-0-0	2
2	CS15101	Artificial Intelligence	3-0-0	3
3	CS15102	Advanced Algorithms	3-0-0	3
4	CS15103	Database Management System	3-0-0	3
5	CS15104	Parallel and Distributed Systems	3-0-0	3
6	CS15105	Theory of Computation	3-0-0	3
		Practical and Sessional Subjects		
7	CS15201	Artificial Intelligence Laboratory	0-0-2	1
8	CS15202	Advanced Algorithms Laboratory	0-0-2	1
9	CS15203	Database Management Systems Laboratory	0-0-2	1
10	CS15204	Parallel and Distributed Systems Laboratory	0-0-2	1
11	ZZ15201	Professional Practice IV	0-0-2	Audit
		Total Credits	**17-0-10**	**21**
		6th Semester		
		Theory Subjects		
1	HS16101	Principles of Management	2-0-0	2
2	CS16101	Cloud Computing	3-0-0	3
3	CS16102	Image Processing	3-0-0	3
4	CS16103	Cryptography and Network Security	3-0-0	3
5	CS16104	Machine Learning **(Open Elective)**	3-0-0	3
6	CS16105	Data Analytics	3-0-0	3
		Practical and Sessionals		
7	CS16201	Cloud Computing and Data Analytics Laboratory	0-0-2	1
8	CS16202	Image Processing Laboratory	0-0-2	1
9	CS16203	Cryptography and Network Security Laboratory	0-0-2	1
10	CS16204	Machine Learning Laboratory	0-0-2	1
11	ZZ16201	Professional Practice V	0-0-2	Audit
12	ZZ16202	Behaviour and Discipline	-	Audit
		Total Credits	**17-0-10**	**21**

		7th Semester		
		Theory Subjects		
1	--	Elective I **(Project Related Subject)**	3-0-0	3
2	--	Elective II	3-0-0	3
3	--	Elective III	3-0-0	3
4	--	Elective IV	3-0-0	3
		Practical and Sessionals		
5	--	Laboratory I	0-0-2	1
6	--	Laboratory II	0-0-2	1
7	--	Laboratory III	0-0-2	1
8	CS17201	Practical Training Evaluation	0-0-2	2
9	CS17202	Major Project Part I	0-0-8	4
		Total Credits	**12-0-16**	**21**
		8th Semester		
		Theory Subjects		
1	--	Elective V **(Project Related Subject)**	3-0-0	3
2	--	Elective VI	3-0-0	3
3	--	Elective VII	3-0-0	3
		Practical and Sessionals		
4	--	Laboratory IV	0-0-2	1
5	--	Laboratory V	0-0-2	1
6	CS18201	Major Project Part II	0-0-12	6
7	ZZ18201	Behaviour and Discipline	-	Audit
		Total Credits	**9-0-16**	**17**

- Any one elective subject may be offered as open elective (for specific departments).
- For all electives except Elective I and Elective V, the course can be selected from the approved list of elective/open elective courses. Students who are doing internship outside the institute will be permitted to opt these courses in online mode, if available. Otherwise, they may select the equivalent subject from the subjects available on the online platform with the permission of the department.
- For Elective I and Elective V, the supervisor has to assign course and also the course contents. The same should bear the approval of the departmental committee constituted by the Head. The committee must consist of minimum three faculty members. The examination and evaluation will be done by the supervisor. It is desirable that the concern supervisor selects the courses available on the online platform as approved by the department.
- Laboratory I to Laboratory V will be assigned in accordance to the elective subjects offered in that semester or may be related to some advanced software/hardware tools/techniques as decided by the department.
- Practical Training shall be carried out after completion of the sixth semester and during the summer vacation. The evaluation of the same will be done in the seventh semester. This includes internship carried out at industries/ R&D organizations/ reputed academic institutions. Any practical training/internship done before the sixth semester shall not be counted against the above.

List of Electives			
CS1*111	Software Project Management	3-0-0	3
CS1*112	Software Testing	3-0-0	3
CS1*113	Software Architecture	3-0-0	3
CS1*114	Software Modeling and Design	3-0-0	3
CS1*115	Computer Graphics	3-0-0	3
CS1*116	Computer Vision	3-0-0	3
CS1*117	Pattern Recognition	3-0-0	3
CS1*118	Compiler Design	3-0-0	3
CS1*119	Web Programming	3-0-0	3
CS1*120	VLSI Design	3-0-0	3
CS1*121	Embedded System	3-0-0	3
CS1*122	Real Time Systems	3-0-0	3
CS1*123	Deep Learning	3-0-0	3
CS1*124	Natural Language Processing	3-0-0	3
CS1*125	Advanced Topics in DBMS	3-0-0	3
CS1*126	Advanced Data Structures & Algorithms	3-0-0	3
CS1*127	Advanced Computer Networks	3-0-0	3
CS1*128	Internet of Things	3-0-0	3
CS1*129	Mobile Computing	3-0-0	3
CS1*130	Mainframe Technology	3-0-0	3
CS1*131	Fog and Edge Computing	3-0-0	3
CS1*132	Search Engine Optimization	3-0-0	3
CS1*133	Information Retrieval Techniques and Evaluation	3-0-0	3
CS1*134	Virtual Reality	3-0-0	3
CS1*135	Bioinformatics	3-0-0	3
CS1*136	Quantum Computing	3-0-0	3
CS1*137	Nature-Inspired Computing	3-0-0	3
CS1*138	Information Theory and Coding	3-0-0	3
CS1*139	Wireless Network Security	3-0-0	3
CS1*140	Public Key Infrastructure and Trust Management	3-0-0	3
CS1*141	Advanced Topics in Cyber Security	3-0-0	3
CS1*142	Cyber Forensics	3-0-0	3
CS1*143	Blockchain Technology	3-0-0	3
CS1*144	Software Defined Networking	3-0-0	3

* The semester number in which the subject is offered.