Course Structure

For

4-Year B.Tech. Degree

in

Computer Science and Engineering

Indian Institute of Information Technology Kalyani

Webel IT Park Campus

West Bengal 741235, India

1st Year (Semester: I)							
Sl No.	Code No.	Subject	Contact Periods/week				Credit
			L	T	P	Total	
Theoretical Papers							
1	MA 101	Mathematics – I (Linear Algebra)	3	1	0	4	4
2	PH 101	Physics	3	1	0	4	4
3	EC 101	Basic Electrical and Electronics Engineering	3	0	0	3	3
4	CS 101	Programming with C/C++	3	0	0	3	3
5	HU 101	English for Communication	3	0	0	3	3
6	HU 102	Humanities – I (Values & Ethics in Profession)	3	0	0	3	3
Sessional Papers							
7	CS 111	Programming with C/C++ Lab	0	0	3	3	2
8	EC 111	Basic Electronics Engineering Lab	0	0	3	3	2
Total			**18**	**2**	**6**	**26**	
						Total Credits	**24**

1st Year (Semester: II)							
Sl No.	Code No.	Subject	Contact Periods/Week			Total	Credit
			L	T	P		
Theoretical Papers							
1	CS 201	Data Structures and Algorithms	3	1	0	4	4
2	EC 201	Digital Logic Design and Circuit	3	0	0	3	3
3	CS 202	Foundations of Data Science – I (Probability and Statistics)	3	1	0	4	4
4	CS 203	Discrete Mathematics	3	1	0	4	4
5	HU 201	Humanities – II (Economics)	3	0	0	3	3
Sessional Papers							
6	EC 211	Digital Logic Design and Circuit Lab	0	0	3	3	2
7	CS 211	Data Structures and Algorithms Lab	0	0	3	3	2
8	CS 212	Introduction to Environmental Data Science	1	0	2	3	2
Total			**16**	**3**	**8**	**27**	
						Total Credits	**24**

2nd Year (Semester: III)							
Sl No.	Code No.	Subject	Contact Periods/week				Credit
			L	T	P	Total	
Theoretical Papers							
1	MA 301	Mathematics – II (Calculus and Differential Equation)	3	1	0	4	4
2	CS 301	Computer Organization and Architecture	3	0	0	3	3
3	CS 302	Algorithms – I	3	1	0	4	4
4	CS 303	Formal Languages and Automata Theory	3	1	0	4	4
5	HU 301	Humanities – III (Psychology)	3	0	0	3	3
Sessional Papers							
6	CS 311	Computer Organization and Architecture Lab	0	0	3	3	2
7	CS 312	Algorithms – I Lab	0	0	3	3	2
8	CS 313	Data Science Lab – I (Python)	1	0	2	3	2
Total			**16**	**3**	**8**	**27**	
						Total Credits	**24**

2nd Year (Semester: IV)							
Sl No.	Code No.	Subject	Contact Periods/Week			Total	Credit
			L	T	P		
Theoretical Papers							
1	CS 401	Operating Systems	3	0	0	3	3
2	CS 402	Foundations of Data Science – II (Numerical Analysis and Computing)	3	1	0	4	4
3	CS 403	Object Oriented Programming (JAVA)	3	0	0	3	3
4	EC 401	Data Communications	3	0	0	3	3
5	EC 402	Signals and Systems	3	0	0	3	3
Sessional Papers							
6	CS 411	Operating Systems Lab	0	0	3	3	2
7	CS 412	Data Science Lab – II (R/Sci Lab)	0	0	3	3	2
8	CS 413	Object Oriented Programming (JAVA) Lab	0	0	3	3	2
Total			**15**	**1**	**9**	**25**	
						Total Credits	**24**

3rd Year (Semester: V)							
Sl No.	Code No.	Subject	Contact Periods/week				Credit
			L	T	P	Total	
Theoretical Papers							
1	CS 501	Compiler Design	3	0	0	3	3
2	CS 502	Artificial Intelligence	3	0	0	3	3
3	EC 501	Microprocessor and Microcontroller System	3	0	0	3	3
4	*	Elective – I	3	0	0	3	3
5	HU 501	Humanities - IV (Financial Management and Organizational Behaviour)	4	0	0	4	4
Sessional Papers							
6	CS 511	Compiler Design Lab	0	0	3	3	2
7	EC 511	Microprocessor and Microcontroller System Lab	0	0	3	3	2
8	CS 591	Project – I (A)	0	0	5	5	3
Total			**16**	**0**	**11**	**27**	
						Total Credits	**23**

3rd Year (Semester: VI)							
Sl No.	Code No.	Subject	Contact Periods/Week			Total class load/ Week	Credits
			L	T	P		
Theoretical Papers							
1	CS 601	Computer Networks	3	0	0	3	3
2	CS 602	Database Management System	3	0	0	3	3
3	CS 603	Machine Learning	3	0	0	3	3
4	CS 604	Cognitive Science and Technology	3	0	0	3	3
5	*	Elective – II	3	0	0	3	3
Sessional Papers							
6	CS 611	Computer Networks Lab	0	0	3	3	2
7	CS 612	Database Management System Lab	0	0	3	3	2
8	HU 611	Soft Skill Development	0	0	3	3	2
9	CS 691	Project – I (B)	0	0	5	5	3
Total			**15**	**0**	**14**	**29**	
						Total Credits	**24**

4th Year (Semester: VII)							
Sl No.	Code No.	Subject	Contact Periods/week				Credit
			L	T	P	Total	
Theoretical Papers							
1	CS 701	Algorithms – II	3	0	0	3	3
2	CS 702	Software Engineering	3	0	0	3	3
3	*	Elective – III	3	0	0	3	3
4	*	Elective – IV	3	0	0	3	3
Sessional Papers							
5	CS 711	Algorithms – II Lab	0	0	3	3	2
6	CS 791	Project – II (A)	0	0	15	15	10
Total			**12**	**0**	**18**	**30**	
						Total Credits	**24**

4th Year (Semester: VIII)							
Theoretical Papers							Credits
Sl No.	Code No.	Subject	Contact Periods/Week			Total class load/ Week	
			L	T	P		
1	*	Elective – V	3	0	0	3	3
2	*	Elective – VI	3	0	0	3	3
3	*	Elective – VII	3	0	0	3	3
Sessional Papers							
4	CS 891	Project – II (B)	0	0	15	15	10
5	CS 892	Comprehensive Viva	0	0	0	0	3
Total			**9**	**0**	**15**	**24**	
						Total Credits	**22**

***Refers to the elective papers as mentioned below**

Elective Subjects

Elective Thread - I

Theoretical Computation

Sl No.	Code No.	Subject	Contact Periods/week				Credit
			L	T	P	Total	
1	CS E21	Theory of Computation	3	0	0	3	3
2	CS E22	Advanced Algorithms	3	0	0	3	3
3	CS E23	Parallel and Distributed Computing	3	0	0	3	3
4	CS E24	Computational Number Theory	3	0	0	3	3
5	CS E25	Computational Complexity	3	0	0	3	3
6	CS E26	Computational Geometry	3	0	0	3	3
7	CS E27	Quantum Computing	3	0	0	3	3
8	CS E28	Fuzzy Logic and Applications	3	0	0	3	3
9	CS E29	Mathematical Methods	3	0	0	3	3

Elective Thread - II

Data Science & Machine Intelligence

Sl No.	Code No.	Subject	Contact Periods/week				Credit
			L	T	P	Total	
1	CS E31	Neural Networks and Deep Learning	3	0	0	3	3
2	CS E32	Data Analytics & Optimization Techniques	3	0	0	3	3
3	CS E34	Soft Computing	3	0	0	3	3
4	CS E35	Data Mining	3	0	0	3	3
5	CS E36	Speech and Natural Language Processing	3	0	0	3	3
6	CS E37	Computer Vision and Image Understanding	3	0	0	3	3
7	CS E38	Big Data Analytics	3	0	0	3	3
8	CS E39	Business Data Analytics	3	0	0	3	3

Elective Thread - III

Hardware and Systems

Sl No.	Code No.	Subject	Contact Periods/week				Credit
			L	T	P	Total	
1	CS E41	Distributed Operating Systems	3	0	0	3	3
2	CS E42	Distributed Database Management System	3	0	0	3	3
3	CS E43	Advanced Computer Architecture	3	0	0	3	3
4	CS E44	Embedded System	3	0	0	3	3
5	CS E45	Low Power Circuits and Systems	3	0	0	3	3
6	CS E46	Fault Tolerant Computing	3	0	0	3	3
7	CS E47	Real Time Systems	3	0	0	3	3
8	CS E48	Ad-Hoc and Sensor Networks	3	0	0	3	3
9	CS E49	VLSI System Design	3	0	0	3	3
10	CS E51	Robotics: Machines and Control	3	0	0	3	3
11	CS E52	Internet of Things	3	0	0	3	3
12	CS E53	Satellite Communication	3	0	0	3	3
13	CS E54	Electronic Devices and Circuits	3	0	0	3	3
14	CS E55	Control System Engineering	3	0	0	3	3

Elective Thread - IV							
Information Security							
Sl No.	Code No.	Subject	Contact Periods/week				Credit
			L	T	P	Total	
1	CS E56	Number Theory	3	0	0	3	3
2	CS E57	Information Theory and Coding	3	0	0	3	3
3	CS E58	Advanced Cryptography	3	0	0	3	3
4	CS E59	Digital and Cyber Forensics	3	0	0	3	3
5	CS E61	Cyber Physical Systems	3	0	0	3	3
6	CS E62	Cyber Law and Security	3	0	0	3	3
7	CS E63	Digital Data Security	3	0	0	3	3

Elective Thread - V							
Applications							
Sl No.	Code No.	Subject	Contact Periods/week				Credit
			L	T	P	Total	
1	CS E64	Digital Signal Processing	3	0	0	3	3
2	CS E65	Image Analysis	3	0	0	3	3
3	CS E66	Multimedia Systems	3	0	0	3	3
4	CS E67	Computer Graphics and Multimedia	3	0	0	3	3
5	CS E68	Cloud Computing	3	0	0	3	3
6	CS E69	Web Technology	3	0	0	3	3
7	CS E71	Mobile Computing	3	0	0	3	3

Elective Thread - VI							
Open Electives							
Sl No.	Code No.	Subject	Contact Periods/week				Credit
			L	T	P	Total	
1	CS E72	Logic & Reasoning	3	0	0	3	3
2	CS E73	Perceptual Computing	3	0	0	3	3
3	CS E74	Global Impact & Society	3	0	0	3	3
4	CS E75	Indian Music System	3	0	0	3	3
5	CS E76	Introduction to Philosophical Thought	3	0	0	3	3
6	CS E77	Comparative Study of Literature	3	0	0	3	3
7	CS E78	History of Science & Engineering	3	0	0	3	3
8	CS E79	Economic Policies in India	3	0	0	3	3
9	CS E81	Research in Entrepreneurship	3	0	0	3	3
10	CS E82	Constitution of India	3	0	0	3	3
11	CS E83	Introduction to Art and Aesthetics	3	0	0	3	3
12	CS E84	Human Resource Management	3	0	0	3	3