Dr.B. C. Roy Engineering College, Durgapur
(approved by AICTE & affiliated to MAKAUT)

COURSE STRUCTURE

for

B.TECH. DEGREE

in

COMPUTER SCIENCE AND ENGINEERING

(Cyber Security)

(Applicable from the academic session 2024-2025)

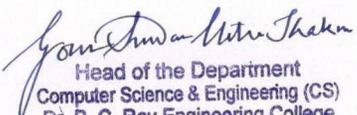## Dr. B. C. Roy Engineering College

An Autonomous Institution

Approved by: All India Council for Technical Education (AICTE)

Affiliated to: Maulana Abul Kalam Azad University of Technology, West Bengal
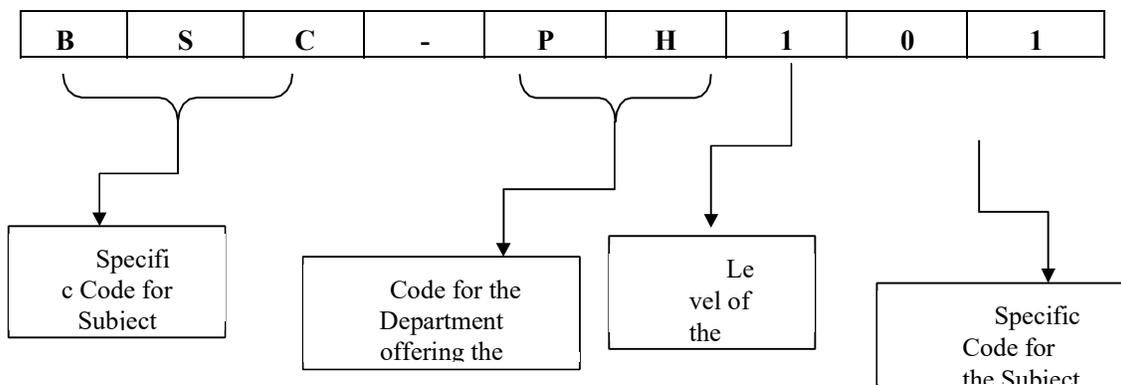### *(Formerly Known as -WBUT)*

Jemua Road, Durgapur, West Bengal, India,713206

The first year course structure (Page 3 and Page 4) is unanimously accepted and approved in the first BoS meeting held in the Department of a) Physics, b) Chemistry, c) Mathematics, d) English, e) Electrical Engineering, f) Electronics and Communication Engineering, g) Computer Science and Engineering, h) Mechanical Engineering. The BoS of CSE (AIML) in its first meeting (held in the Department of CE (AIML) on 6th November, 2024 has unanimously accepted and approved the four-year course structure of CSE (AIML).

Subject Numbering Scheme:

B	S	C	-	P	H	1	0	1

Specific Code for Subject

Code for the Department offering the

Level of the

Specific Code for the Subject

Semester Wise Break Up of Credit (New Autonomous Structure)

Sem1	Sem2	Sem3	Sem4	Sem5	Sem6	Sem7	Sem8	Total
20	23	21	23	25	20	21	12	165

S. No.	Category	Breakup of Credits (Actual) As per Proposed Autonomous Structure
1.	Humanities and Social Sciences including Management courses	10
2.	Basic Science Courses	20
3.	Engineering Science courses including workshop, drawing, basics of electrical/ mechanical/ computer etc.	25
4.	Professional core course	61
5.	Professional Elective specialization/branch courses relevant to chosen	12
6.	Indian Knowledge System	Non- Credit
7.	Multidisciplinary Open Electives Courses	11
8.	Project work, seminar and internship in industry or appropriate work place/ academic and research institutions in India/abroad	26
9.	Mandatory Non Credit Courses – Audit Course	
Total Credits		**165**

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Dr. B. C. Roy Engineering College Durgapur (An autonomous institute)
Department of Computer Science and Engineering (Cyber Security)
Proposed Curriculum Structure (effective from 2024-25 admission batch)

Semester: I

Sl. No.	Category (Major/Minor/Multi-Disciplinary/Ability Enhancement/Skill	Course Type (BS/HM/ES/PC/PE/OE)	Course Code (2024-25)	Course Code (2025-26 onwards)	Course Title	L	T	P	Type	Credit
1	Ability Enhancement	BS	BSC-M101	M-101	MATHEMATICS-I	3	0	0	Theory	3
2	Multi-Disciplinary	BS	BSC-PH101	PH-101	PHYSICS	3	0	0	Theory	3
3	Multi-Disciplinary	ES	ESC-EE101	EE-101	BASIC ELECTRICAL ENGINEERING	3	0	0	Theory	3
4	Multi-Disciplinary	ES	ESC-ME101	ME-101	ENGINEERING MECHANICS	3	0	0	Theory	3
5	Ability Enhancement	HM	HS-MC101	ENG-101	ENGLISH LANGUAGE AND TECHNICAL COMMUNICATION	3	0	0	Theory	3
6	Multi-Disciplinary	BS	BSC-PH191	PH-191	PHYSICS LAB	0	0	2	Practical	1
7	Multi-Disciplinary	ES	ESC-EE191	EE-191	BASIC ELECTRICAL ENGINEERING LAB	0	0	2	Practical	1
8	Ability Enhancement	HM	HS-MC191	ENG-191	LANGUAGE LAB	0	0	2	Practical	1
9	Skill Enhancement	ES	ESC-ME192	ME-192	WORKSHOP PRACTICES	0	0	4	Practical	2
10		Extra Curr.	BS-121	BS-181	NSS Activity	0	0	0	Sessional	
					TOTAL CREDIT					**20**

Semester: II

Sl. No.	Category (Major/Minor/Multi-Disciplinary/Ability Enhancement/Skill Enhancement/Value Added)	Course Type (BS/HM/ES/PC/PE/OE)	Course Code (2024-25)	Course Code (2025-26 onwards)	Course Title	L	T	P	Type	Credit
1	Multi-Disciplinary	BS	BSC-CH201	CH-201	CHEMISTRY	3	0	0	Theory	3
2	Ability Enhancement	BS	BSC-M202	M-202	MATHEMATICS-II	3	0	0	Theory	3
3	Major	ES	ESC-CS201	CS-201	INTRODUCTION TO COMPUTER HARDWARE AND SOFTWARE	3	0	0	Theory	3
4	Major	ES	ESC-CS202	CS-202	PROGRAMMING FOR PROBLEM SOLVING	3	0	0	Theory	3
5	Multi-Disciplinary	ES	ESC-EC201	EC-201	BASIC ELECTRONICS ENGINEERING	3	0	0	Theory	3
6	Ability Enhancement	BS	MC-ES201	ENV-281	ENVIRONMENTAL SCIENCE	0	0	0	Sessional	0
7	Multi-Disciplinary	BS	BSC-CH291	CH-291	CHEMISTRY LAB	0	0	2	Practical	1
8	Major	ES	ESC-CS291	CS-291	INTRODUCTION TO COMPUTER HARDWARE AND SOFTWARE LAB	0	0	4	Practical	2
9	Major	ES	ESC-CS292	CS-292	PROGRAMMING FOR PROBLEM SOLVING LAB	0	0	4	Practical	2
10	Multi-Disciplinary	ES	ESC-EC291	EC-291	BASIC ELECTRONICS ENGINEERING LAB	0	0	2	Practical	1
11	Skill Enhancement	ES	ESC-ME291	ME-291	ENGINEERING GRAPHICS	0	0	4	Practical	2
					TOTAL CREDIT					**23**

Semester: III											
Sl. No.	Category (Major/Minor/Multi-Disciplinary/Ability Enhancement/Skill Enhancement/Value Added)	Course Type (BS/HM/ES/PC/PE/OE)		Course Code (2025-26 onwards)	Course Title	L	T	P	Type	Credit
1	Major	PC		CY-301	Data Structure & Algorithms using C/C++	3	0	0	Theory	3
2	Major	PC		CY-302	Operating System	3	0	0	Theory	3
3	Ability Enhancement	BS		CY-303	Discrete Mathematics	3	0	0	Theory	3
4	Major	PC		CY-304	Introduction to Object Oriented Programming	3	0	0	Theory	3
5	Major	PC		CY-305	Introduction to Cyber Security Essentials	3	0	0	Theory	3
6	Value Added Course	HM		CY-386	Indian Constitution	0	0	0	Sessional	0
7	Major	PC		CY-391	Data Structure & Algorithms Lab	0	0	4	Practical	2
8	Major	PC		CY-394	Object Oriented Programming Lab using Java	0	0	4	Practical	2
9	Major	PC		CY-395	Introduction to Cyber Security Essentials Lab	0	0	4	Practical	2
TOTAL CREDIT										21

Semester: IV											
Sl. No.	Category (Major/Minor/Multi-Disciplinary/Ability Enhancement/Skill Enhancement/Value Added)	Course Type (BS/HM/ES/PC/PE/OE)		Course Code (2025-26 onwards)	Course Title	L	T	P	Type	Credit
1	Major	PC		CY-401	Network Security & Cryptography	3	0	0	Theory	3
2	Major	PC		CY-402	Artificial Intelligence	3	0	0	Theory	3
3	Major	PC		CY-403	Computer Networks	3	0	0	Theory	3
4	Major	PC		CY-404	Hardware Security	3	0	0	Theory	3
5	Ability Enhancement	BS		CY-405	Mathematics for Cyber Securiy	3	0	0	Theory	3
6	Major	PC		CY-491	Network Security & Cryptography Lab	0	0	4	Practical	2
7	Major	PC		CY-493	Computer Networks Lab	0	0	4	Practical	2
8	Skill Enhancement	PC		CY-496	Web development lab	0	0	4	Practical	2
9	Skill Enhancement	PC		CY-497	Data Handling & Visualization (Python)	0	0	4	Practical	2
TOTAL CREDIT										23

				Semester: V					
Sl. No.	Category (Major/Minor/Multi-Disciplinary/Ability Enhancement/Skill Enhancement/Value Added)	Course Type (BS/HM/ES/PC/PE/OE)		Course Code (2025-26 onwards)	Course Title	L	T	P	Type	Credit
1	Major	PC		CY-501	Machine Learning Algorithms for Cyber Security	3	0	0	Theory	3
2	Major	PC		CY-502	Introduction to Block Chain & Digital Forensics	3	0	0	Theory	3
3	Major	PE		CY-503/504	Professional Core Electives -I (Steganography & Watermarking Techniques/ Data Analytics for Fraud Detection)	3	0	0	Theory	3
4	Minor	OE		CY-505/506	Open Elective-I (Web Application Security/Operational Technology Security)	3	0	0	Theory	3
5	Major	PC		CY-507	Database Management Systems	3	0	0	Theory	3
6	Major	PC		CY-591	Machine Learning Algorithms for Cyber Security lab	0	0	4	Practical	2
7	Multi-Disciplinary	OE		CY-595/596	Open Elective-I Lab	0	0	4	Practical	2
8	Major	PC		CY-597	Database Management Systems Lab	0	0	4	Practical	2
9	Skill Enhancement	PC		CY-581	Minor Project-I	0	0	0	Practical	4
				TOTAL CREDIT						**25**

				Semester: VI					
Sl. No.	Category (Major/Minor/Multi-Disciplinary/Ability Enhancement/Skill Enhancement/Value Added)	Course Type (BS/HM/ES/PC/PE/OE)		Course Code (2025-26 onwards)	Course Title	L	T	P	Type	Credit
1	Multi-Disciplinary / Minor	OE		CY-601/602	Open Elective-II(Quantum Cryptography / Internet of Things)	3	0	0	Theory	3
2	Major	PE		CY-603/604	Professional Core Electives -II (Cyber Threat Intelligence and Incident Response/ Malware Analysis)	3	0	0	Theory	3
3	Ability Enhancement	PC		CY-605	Principles of Cyber Law & Ethics	3	0	0	Theory	3
4	Major	PC		CY-606	Vulnerability Assessment & Penetration Testing	3	0	0	Theory	3
5	Major	PC		CY-696	Vulnerability Assessment & Penetration Testing Lab	0	0	4	Practical	2
6	Skill Enhancement	PC		CY-697	Cyber Security Tools Lab	0	0	4	Practical	2
7	Skill Enhancement	PC		CY-681	Minor Project-II	0	0	0	Sessional	4
				TOTAL CREDIT						**20**

	Semester: VII										
Sl. No.	Category (Major/Minor/Multi-Disciplinary/Ability Enhancement/Skill Enhancement/Value Added)	Course Type (BS/HM/ES/PC/PE/OE)		Course Code (2025-26 onwards)	Course Title	L	T	P	Type	Credit	
	Major	PE		CY-701/702	Professional Core Electives -III (Digital Image Processing for Secure System/ Visual Cryptography)	3	0	0	Theory	3	
	Multi-Disciplinary / Minor	OE		CY-703/704	Open Elective-III (Cloud Computing/ Adhoc Sensor Network)	3	0	0	Theory	3	
	Ability Enhancement	HM		CY-705	Economics for Engineers	3	0	0	Theory	3	
	Skill Enhancement	PC		CY-781	Capstone Project -I	0	0	0	Sessional	6	
	Skill Enhancement	PC		CY-782	Internship	0	0	0	Sessional	6	
	TOTAL CREDIT									**21**	

	Semester: VIII										
Sl. No.	Category (Major/Minor/Multi-Disciplinary/Ability Enhancement/Skill Enhancement/Value Added)	Course Type (BS/HM/ES/PC/PE/OE)		Course Code (2025-26 onwards)	Course Title	L	T	P	Type	Credit	
1	Major	PE		CY-801/802	Professional Core Electives -IV (IOT Security/ Digital Privacy and Social Engineering Defense)	3	0	0	Theory	3	
2	Value Added Course	HM		CY-803	Introduction to Entrepreneurship	3	0	0	Theory	3	
3	Skill Enhancement	PC		CY-882	Capstone Project -II	0	0	0	Sessional	6	
	TOTAL CREDIT									**12**	