COURSE STRUCTURE

for

B.TECH. DEGREE

in

COMPUTER SCIENCE AND ENGINEERING

(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)

(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)

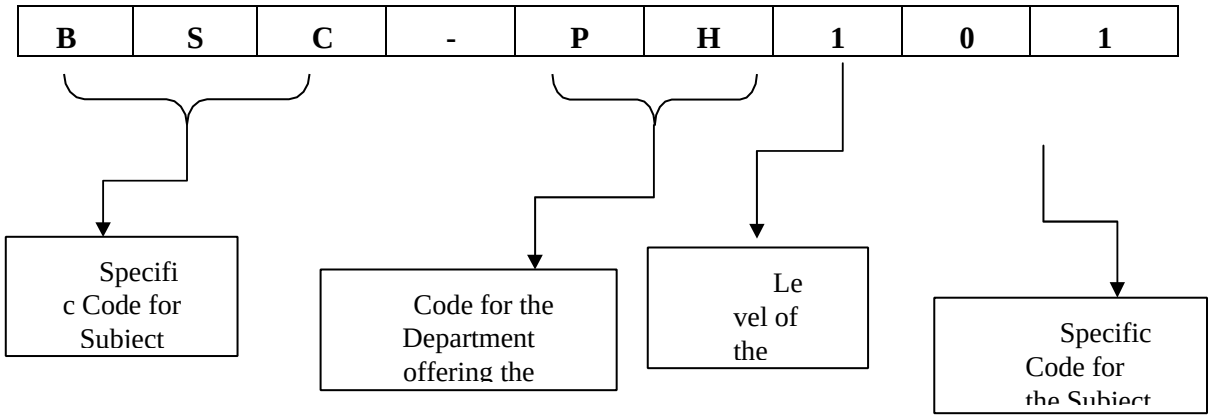
Affiliated to: Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly Known as -WBUT)

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).

Head of the Department
Computer Science & Engineering (AIML)
Dr. B. C. Roy Engineering College
Durgapur

Subject Numbering Scheme:



Semester Wise Break Up of Credit (New Autonomous Structure)

Sem1	Sem2	Sem3	Sem4	Sem5	Sem6	Sem7	Sem8	Total
20	22	21	23	24	23	24	18	175

S. No.	Category	Breakup of Credits (Actual) As per Proposed Autonomous Structure
1.	Humanities and Social Sciences including Management courses	14
2.	Basic Science Courses	14
3.	Engineering Science courses including workshop, drawing, basics of electrical/ mechanical/ computer etc.	30
4.	Professional core course	71
5.	Professional Elective specialization/branch courses relevant to chosen	12
6.	Indian Knowledge System	02
7.	Multidisciplinary Open Electives Courses	6
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		**175**

B. Tech., 1stYr (1st Semester)

Theory							
Sl No	**Paper Name**	**Paper Code**	**Marks**	**L**	**T**	**P**	**Credit**
1	**Mathematics-I**	**BSC-M 101**	**100**	**3**	**0**	**0**	**3**
2	**Physics**	**BSC- PH 101**	**100**	**3**	**0**	**0**	**3**
3	**Basic Electrical Engineering**	**ESC- EE 101**	**100**	**3**	**0**	**0**	**3**
4	**Engineering Mechanics**	**ESC-ME 101**	**100**	**3**	**0**	**0**	**3**
5	**English Language and Technical Communication**	**HS-MC 101**	**100**	**3**	**0**	**0**	**3**
	Total Theory		**500**	**15**	**0**	**0**	**15**
Practical							
1	**Physics Lab**	**BSC-PH 191**	**100**	**0**	**0**	**2**	**1**
2	**Basic Electrical Engineering Lab**	**ESC-EE 191**	**100**	**0**	**0**	**2**	**1**
3	**Language Lab**	**HS-MC 191**	**100**	**0**	**0**	**2**	**1**
4	**Workshop Practices**	**ESC-ME 192**	**100**	**0**	**0**	**4**	**2**
	Total Practical		**400**	**0**	**0**	**10**	**5**
	Total in 1st Semester		**900**	**15**	**0**	**10**	**20**
Extra Curricular Activity							
1	**NSS**	**EC-NSS 101**	**100**				**0**

B. Tech. 1st Yr (2nd Semester)

Theory							
Sl. No.	**Paper Name**	**Paper Code**	**Marks**	**L**	**T**	**P**	**Credit**
1	Mathematics-II	BSC-M 201	100	3	0	0	3
2	Chemistry	BSC-CH 201	100	3	0	0	3
3	Basic Electronics Engineering	ESC-EC 201	100	3	0	0	3
4	Introduction to Computer Hardware and Software	ESC-CS 201	100	3	0	0	3
5	Programming for Problem Solving	ESC-CS 202	100	3	0	0	3
	Total Theory		500	15	0	0	15
Practical							
1	Chemistry Lab	BSC-CH 291	100	0	0	2	1
2	Basic Electronics Engineering Lab	ESC-EC 291	100	0	0	2	1
3	Engineering Graphics	ESC-ME 291	100	0	0	4	2
4	Introduction to Computer Hardware and Software Lab	ESC-CS 291	100	0	0	2	1
5	Programming for Problem Solving Lab	ESC-CS 292	100	0	0	4	2
	Total Practical		500	0	0	14	7
	Total of 2nd Semester		1000	15	0	14	22
Mandatory Courses							
1	Environmental Science	MC-ES 201		1	0	0	0

Total Credit in 1st Year: 42

Sl No	Broad Category	Category	Course Code	Course Title	Hours per week				
					L	T	P	Total	Credits
2nd Year 1st Semester									
A. THEORY									
1	Program Core Courses	Ability Enhancement Courses	PCC-AIML 301	Introduction to Object Oriented Programming	3	0	0	3	3
2	Program Core Courses	Ability Enhancement Courses	PCC-AIML 302	Data Structure	3	0	0	3	3
3	Engineering Science Courses	Major	ESC-M 301	Discrete Maths	3	0	0	3	3
4	Audit Courses	Minor		Indian Constitution					
5	Program Core Courses	Ability Enhancement Courses	PCC-AIML 303	Computer System Organization	3	0	0	3	3
6	Program Core Courses	Ability Enhancement Courses	PCC-AIML 304	Introduction to Artificial Intelligence	3	0	0	3	3
B. PRACTICAL/SESSIONAL									
1	Program Core Courses	Skill Enhancement Courses	PCC-AIML 391	Introduction to Object Oriented Programming Lab	0	0	4	4	2
2	Program Core Courses	Skill Enhancement Courses	PCC-AIML 392	Data Structure Lab	0	0	4	4	2
3	Program Core Courses	Skill Enhancement Courses	PCC-AIML 393	AI/ML Workshop-I (Using Python)	0	0	4	4	2
2nd Year 2nd Semester									
A. THEORY									
1	Program Core	Value	PCC-	AI, Ethics, Society	3	0	0	3	3

	Courses	Added Courses	AIML 401						
2	Program Core Courses	Ability Enhancement Courses	PCC-AIML 402	Design and Analysis of Algorithm	3	0	0	3	3
3	Program Core Courses	Ability Enhancement Courses	PCC-AIML 403	Operating Systems	3	0	0	3	3
4	Program Core Courses	Ability Enhancement Courses	PCC-AIML 404	Machine Learning	3	0	0	3	3
5	Engineering Science Courses	Major	ESC-M 401	Mathematics for AIML	3	0	0	3	3
B. PRACTICAL/SESSIONAL									
1	Program Core Courses	Skill Enhancement Courses	PCC-AIML 492	Design and Analysis of Algorithm Lab	0	0	4	4	2
2	Program Core Courses	Skill Enhancement Courses	PCC-AIML 494	Machine Learning Lab	0	0	4	4	2
3	Program Core Courses	Skill Enhancement Courses	PCC-AIML 495	Web development lab	0	0	4	4	2
4	Program Core Courses	Skill Enhancement Courses	PCC-AIML 496	Data Handling and Data Visualization	0	0	4	4	2
3rd Year 1st Semester									
A. THEORY									
1	Program Core Courses	Ability Enhancement Courses	PCC-AIML 501	Deep Learning -I	3	0	0	3	3
2	Program Core Courses	Ability Enhancement Courses	PCC-AIML 502	Computer Networks	3	0	0	3	3
3	Program Core Courses	Ability Enhancement Courses	PCC-AIML 503	Database Management Systems	3	0	0	3	3

4	Open Elective Courses	Minor	OEC-AIML 504 A/B/C	Open Elective-I	3	0	0	3	3
5	Project work	Ability Enhancement Courses	PROJ-AIML 581	Minor Project-I	4	0	0	4	4
B. PRACTICAL/SESSIONAL									
1	Program Core Courses	Skill Enhancement Courses	PCC-AIML 591	Deep Learning I Lab	0	0	4	4	2
2	Program Core Courses	Skill Enhancement Courses	PCC-AIML 592	Computer Networks Lab	0	0	4	4	2
3	Program Core Courses	Skill Enhancement Courses	PCC-AIML 593	Database Management Systems Lab	0	0	4	4	2
4	Program Core Courses	Skill Enhancement Courses	PCC-AIML 594	AI/ML Workshop-II	0	0	4	4	2
3rd Year 2nd Semester									
A. THEORY									
1	Open Elective Courses	Minor	OEC-AIML 601 A/B/C	Open Elective-II	3	0	0	3	3
2	Program Core Courses	Ability Enhancement Courses	PCC-AIML 601	Deep Learning -II	3	0	0	3	3
3	Program Core Courses	Ability Enhancement Courses	PCC-AIML 602	Software Engineering	3	0	0	3	3
4	Humanities and Social Science	Minor	HSMC 603	Introduction to Entrepreneurship	3	0	0	3	3
5	Program Core Courses	Ability Enhancement Courses	PCC-AIML 603	Optimization Techniques in Machine Learning	3	0	0	3	3

6	Project work	Ability Enhancement Courses	PROJ-AIML 681	Minor Project-II	4	0	0	4	4
B. PRACTICAL/SESSIONAL									
1	Program Core Courses	Skill Enhancement Courses	PCC-AIML 692	Software Engineering Lab	**0**	**0**	**4**	**4**	**2**
2	Program Core Courses	Skill Enhancement Courses	PCC-AIML 691	Deep Learning II Lab	0	0	4	4	2
4th Year 1st Semester									
A. THEORY									
1	Projects	Ability Enhancement Courses	PROJ-AIML 781	Internship	6	0	0	6	6
2	Professional Core Elective	Value Added Courses	PCE-AIML 701 A/B/C	Professional Core Electives -I	3	0	0	3	3
3	Professional Core Elective	Value Added Courses	PCE-AIML 702 A/B/C	Professional Core Electives -II	3	0	0	3	3
4	Humanities and Social Science	Minor	HSMC 701	UHV-II	3	0	0	3	3
5	Program Core Courses	Ability Enhancement Courses	PCC-AIML 701	Soft Computing	3	0	0	3	3
6	Project work	Ability Enhancement Courses	PROJ-AIML 782	Capston Project -I	6	0	0	6	6
4th Year 2nd Semester									
1	Professional Core Elective	Value Added Courses	PCE-AIML 801 A/B/C	Professional Core Electives -III	3	0	0	3	3
2	Professional Core Elective	Value Added	PCE-AIML	Professional Core Electives -IV	3	0	0	3	3

		Courses	802 A/B/C						
3	Humanities and Social Science	Value Added Courses	HSMC 801	Cyber Law and Ethics	3	0	0	3	3
4	Humanities and Social Science	Minor	HSMC 802	Industrial Management	3	0	0	3	3
5	Project Work	Ability Enhancement Courses	PROJ-AIML 881	Capston Project -II	6	0	0	6	6

Electives to be offered	
Open Elective -I	Internet of Things/Embedded AI/ Bio-informatics and Computational Biology
Open Elective -II	Blockchain Technology/ AR-VR/Cognitive Computing
Professional Core Electives -I	AI and Cyber Security/ Network Security and Cryptography/ Web Technology/Computer Vision
Professional Core Electives -II	Pattern recognition/ Natural Language Processing/ Speech Processing and Recognition
Professional Core Electives -III	Data science for Engineers/ Predictive Analytics/ Reinforcement Learning
Professional Core Electives -IV	AI in Finance and Economics/ AI for Aquaculture/ Generative AI/ AI in Healthcare

Semester wise Credit Allocation		**Category wise Credit Allocation**	
Semester	**Total Credit**	**Category**	**Credit Allocated**
1st	20	Humanities and Social Science	16
2nd	22	Basic Science Courses	14
3rd	21	Engineering Science Courses	30
4th	23	Program Core Courses (Branch Specific)	71
5th	24	Professional Elective Courses (Branch Specific)	12
6th	23	Open Elective Courses (From HU, Technical Emerging or Other)	6
7th	24	Project work/ Seminar and Internship	26
8th	18	Audit Courses	As prescribed
Total	**175**	**Total**	**175**