

B.Tech. Computer Science and Engineering

CURRICULUM - REGULATIONS 2024

Category of courses and minimum credit requirement for B.Tech. Computer Science and Engineering programme as per Regulations 2024 are outlined below:

Sl. No.	Category of Courses	Credits
1.	Foundation Courses (Humanities and Social Sciences including Management Courses, Basic Science and Engineering Science Courses)	60
2.	Professional Core Courses	60
3.	Professional Elective Courses	18
4.	Open Elective Courses	09
5.	Online Courses	06
6.	Employability Enhancement Courses (Value-added, Community Engagement and Social Responsibility, Skill Development Courses, Soft and Managerial Skills, Internship, Mini-projects, and Capstone project)	27
7.	Audit Courses*	---
	Total Credits	180

***Note:** Audit Courses such as Life Science, Environmental Science, Indian History etc., shall be introduced as they mandate the requirement of Outcome Based Education.

SEMESTER I

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24EN101	Technical English	3	0	0	3
2	U24MA101	Matrices and Differential Calculus	3	1	0	4
3	U24PH101	Engineering Physics	3	0	0	3
4	U24GE101	Principles of Engineering	3	0	0	3
5	U24GE102	Biology for Engineers	3	0	0	3
6	U24EM101	Coding Techniques	3	0	0	3
Practical						
7	U24MA102	Mathematics Laboratory	0	0	2	1
8	U24PH102	Engineering Physics Laboratory	0	0	2	1
9	U24EM102	Coding Techniques Laboratory	0	0	2	1
Total			18	1	6	22

SEMESTER II

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24EN151	Technical Communication Skill Development	2	0	2	3
2	U24MA151	Vector Calculus and Laplace Transforms	3	1	0	4
3	U24CH151	Engineering Chemistry	3	0	0	3
4	U24GE151	Design Thinking	3	0	0	3
5	U24GE152	Engineering Graphics	2	1	0	3
6	U24EM151	Programming in Practice	3	0	0	3
Practical						
7	U24CH152	Engineering Chemistry Laboratory	0	0	2	1
8	U24GE153	Design Thinking Laboratory	0	0	4	2
9	U24GE154	Engineering Practices	0	0	2	1
10	U24EM152	Programming in Practice Laboratory	0	0	2	1
Total			16	2	12	24

SEMESTER III

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24MA201	Multivariate Calculus and Linear Algebra	3	1	0	4
2	U24SH201	Universal Human Values	2	1	0	3
3	U24CS201	Data Structures	3	0	0	3
4	U24CS202	Digital System Design	3	0	0	3
5	U24CS203	Computer Architecture	3	0	0	3
6	U24CS204	Database Management Systems	3	0	0	3
Practical						
7	U24CS205	Data Structures Laboratory	0	0	4	2
8	U24CS206	Digital System Design Laboratory	0	0	2	1
9	U24CS207	Database Management Systems Laboratory	0	0	4	2
Audit Course						
10	U24AUXXX	Audit Course – I	--	--	--	--
Total			17	2	10	24

SEMESTER IV

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24MA251	Discrete Mathematics	3	1	0	4
2	U24CS251	Time Complexity and Analysis of Algorithms	3	0	0	3
3	U24CS252	Theory of Computation	3	0	0	3
4	U24CS253	Operating Systems	3	0	0	3
5	U24CS254	Software Engineering	3	0	0	3
6	U24CS751	Ancient Indian Innovations in Computer Technology (Open Elective - I)	3	0	0	3
Practical						
7	U24CS255	Algorithmics Laboratory	0	0	4	2
8	U24CS256	Operating Systems Laboratory	0	0	2	1
9	U24EM2XX	Internship / Practical Training / Value Added Course(s)	2	0	2	3
Audit Course						
10	U24AUXXX	Audit Course – II	--	--	--	--
Total			20	1	8	25

SEMESTER V

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24MA301	Combinatorics and Graph Theory	3	0	0	3
2	U24CS301	Data Communication and Networks	3	0	0	3
3	U24CS302	Compiler Design	3	0	0	3
4	U24CS7XX	Open Elective – II	3	0	0	3
5	U24CS9XX	Professional Elective - I	3	0	0	3
6	U24CS9XX	Professional Elective - II	3	0	0	3
Practical						
7	U24CS303	Computer Networks Laboratory	0	0	2	1
8	U24CS304	Compiler Design Laboratory	0	0	4	2
9	U24EM301	Value Added Course – Community Engagement and Social Responsibility	1	0	2	2
Audit Course						
10	U24AUXXX	Audit Course – III	--	--	--	--
Total			19	0	8	23

SEMESTER VI

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24MA351	Mathematical Foundation for Data Analytics	3	0	0	3
2	U24CS351	Foundations of Artificial Intelligence	3	0	0	3
3	U24CS352	Principles of Programming Languages	3	0	0	3
4	U24CS7XX	Open Elective – III	3	0	0	3
5	U24CS8XX	Online Course – I	3	0	0	3
6	U24CS9XX	Professional Elective - III	3	0	0	3
7	U24CS9XX	Professional Elective - IV	3	0	0	3
Practical						
8	U24MA352	Computational Statistics Laboratory	0	0	4	2
9	U24EM3XX	Skill Development / Value Added Course(s)	1	0	2	2
Audit Course						
10	U24AUXXX	Audit Course – IV	--	--	--	--
Total			22	0	6	25

SEMESTER VII

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24GE401	Professional Ethics	3	0	0	3
2	U24CS401	Cloud Computing and Virtualization Fundamentals	3	0	0	3
3	U24CS402	Deep Learning Techniques	3	0	0	3
4	U24CS403	Big Data Analytics	3	0	0	3
5	U24CS9XX	Professional Elective - V	3	0	0	3
6	U24CS9XX	Professional Elective - VI	3	0	0	3
Practical						
7	U24CS404	Cloud Computing Laboratory	0	0	4	2
8	U24CS405	Big Data Analytics Laboratory	0	0	4	2
9	U24EM401	Project Phase – I	0	0	8	4
Total			18	0	16	26

SEMESTER VIII

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24CS8XX	Online Course – II	3	0	0	3
Practical						
2	U24EM451	Project Phase – II	0	0	16	8
Total			3	0	16	11

The number of credits in each semester is summarized as follows:

Programme	I	II	III	IV	V	VI	VII	VIII
B.Tech. Computer Science and Engineering	22	24	24	25	23	25	26	11

Semester wise Credit Distribution (in all categories of courses)

Sl. No.	Category of Courses	Credits	I	II	III	IV	V	VI	VII	VIII
1.	Foundation Courses	60	18	20	7	4	3	5	3	-
2.	Professional Core Courses	60	-	-	17	15	9	6	13	-
3.	Professional Elective Courses	18	-	-	-	-	6	6	6	-
4.	Open Elective Courses	9	-	-	-	3	3	3	-	-
5.	Employability Enhancement Courses	27	4	4	-	3	2	2	4	8
6.	Online Courses	6	-	-	-	-	-	3	-	3
7.	Audit Courses	---	-	-	-	-	-	-	-	-
Total		180	22	24	24	25	23	25	26	11

Suggested List of Professional Elective Courses

Professional Elective - I

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24CS901	Advanced Python Programming	3	0	0	3
2	U24CS902	Data Warehousing and Mining	3	0	0	3
3	U24CS903	Software Testing and Automation	3	0	0	3
4	U24CS904	Digital Image Processing	3	0	0	3
5	U24CS905	Object Oriented Analysis and Design	3	0	0	3

Professional Elective - II

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24CS906	Web Data Mining	3	0	0	3
2	U24CS907	Web Technology	3	0	0	3
3	U24CS908	Multicore Architecture	3	0	0	3
4	U24CS909	Web Security	3	0	0	3
5	U24CS910	Distributed Systems	3	0	0	3

Professional Elective - III

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24CS951	Unix Internals	3	0	0	3
2	U24CS952	Internet of Things	3	0	0	3
3	U24CS953	Wireless Sensor Networks	3	0	0	3
4	U24CS954	Mobile Communication	3	0	0	3
5	U24CS955	Service Oriented Architecture	3	0	0	3

Professional Elective - IV

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24CS956	Functional Programming Methods for Analytics	3	0	0	3
2	U24CS957	Natural Language Processing	3	0	0	3
3	U24CS958	Neural Networks	3	0	0	3
4	U24CS959	Social Media Analytics	3	0	0	3
5	U24CS960	Human Computer Interaction	3	0	0	3

Professional Elective - V

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24CS911	Immersive Technologies	3	0	0	3
2	U24CS912	Data Modelling and Programming	3	0	0	3
3	U24CS913	Machine Learning Algorithms	3	0	0	3
4	U24CS914	Reinforcement Learning	3	0	0	3
5	U24CS915	Prompt Engineering	3	0	0	3

Professional Elective - VI

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24CS916	Cryptography and Network Security	3	0	0	3
2	U24CS917	Generative AI Models	3	0	0	3
3	U24CS918	Robotics and Intelligent Systems	3	0	0	3
4	U24CS919	Cyber Physical Systems	3	0	0	3
5	U24CS920	Blockchain Technologies	3	0	0	3

List of Courses under each Category

Foundation Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Humanities & Social Sciences including Management Courses						
1	U24EN101	Technical English	3	0	0	3
2	U24EN151	Technical Communication Skill Development	2	0	2	3
3	U24SH201	Universal Human Values	2	1	0	3
Basic Science Courses						
4	U24MA101	Matrices and Differential Calculus	3	1	0	4
5	U24PH101	Engineering Physics	3	0	0	3
6	U24MA102	Mathematics Laboratory	0	0	2	1
7	U24PH102	Engineering Physics Laboratory	0	0	2	1
8	U24MA151	Vector Calculus and Laplace Transforms	3	1	0	4
9	U24CH151	Engineering Chemistry	3	0	0	3
10	U24CH152	Engineering Chemistry Laboratory	0	0	2	1
11	U24MA201	Multivariate Calculus and Linear Algebra	3	1	0	4
12	U24MA251	Discrete Mathematics	3	1	0	4
13	U24MA301	Combinatorics and Graph Theory	3	0	0	3
14	U24MA351	Mathematical Foundation for Data Analytics	3	0	0	3
15	U24MA352	Computational Statistics Laboratory	0	0	4	2
Engineering Science Courses						
16	U24GE101	Principles of Engineering	3	0	0	3
17	U24GE102	Biology for Engineers	3	0	0	3
18	U24GE151	Design Thinking	3	0	0	3

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
19	U24GE152	Engineering Graphics	2	1	0	3
20	U24GE153	Design Thinking Laboratory	0	0	4	2
21	U24GE154	Engineering Practices	0	0	2	1
22	U24GE401	Professional Ethics	3	0	0	3
Total			45	6	18	60

Professional Core Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24CS201	Data Structures	3	0	0	3
2	U24CS202	Digital Systems Design	3	0	0	3
3	U24CS203	Computer Architecture	3	0	0	3
4	U24CS204	Database Management Systems	3	0	0	3
5	U24CS205	Data Structures Laboratory	0	0	4	2
6	U24CS206	Digital Systems Design Laboratory	0	0	2	1
7	U24CS207	Database Management Systems Laboratory	0	0	4	2
8	U24CS251	Time Complexity and Analysis of Algorithms	3	0	0	3
9	U24CS252	Theory of Computation	3	0	0	3
10	U24CS253	Operating Systems	3	0	0	3
11	U24CS254	Software Engineering	3	0	0	3
12	U24CS255	Algorithmics Laboratory	0	0	4	2
13	U24CS256	Operating Systems Laboratory	0	0	2	1
14	U24CS301	Data Communication and Networks	3	0	0	3
15	U24CS302	Compiler Design	3	0	0	3

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
16	U24CS303	Computer Networks Laboratory	0	0	2	1
17	U24CS304	Compiler Design Laboratory	0	0	4	2
18	U24CS351	Foundations of Artificial Intelligence	3	0	0	3
19	U24CS352	Principles of Programming Languages	3	0	0	3
20	U24CS401	Cloud Computing and Virtualization Fundamentals	3	0	0	3
21	U24CS402	Deep Learning Techniques	3	0	0	3
22	U24CS403	Big Data Analytics	3	0	0	3
23	U24CS404	Cloud Computing Laboratory	0	0	4	2
24	U24CS405	Big Data Analytics Laboratory	0	0	4	2
Total			45	0	30	60

Professional Elective Courses

Sl.No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24CS9XX	Professional Elective – I	3	0	0	3
2	U24CS9XX	Professional Elective - II	3	0	0	3
3	U24CS9XX	Professional Elective - III	3	0	0	3
4	U24CS9XX	Professional Elective - IV	3	0	0	3
5	U24CS9XX	Professional Elective – V	3	0	0	3
6	U24CS9XX	Professional Elective - VI	3	0	0	3
Total			18	0	0	18

Open Elective Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24CS751	Ancient Indian Innovations in Computer Technology (Open Elective – I)	3	0	0	3
2	U24CS7XX	Open Elective – II	3	0	0	3
3	U24CS7XX	Open Elective – III	3	0	0	3
Total			9	0	0	9

Employability Enhancement Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EM101	Coding Techniques	3	0	0	3
2	U24EM102	Coding Techniques Laboratory	0	0	2	1
3	U24EM151	Programming in Practice	3	0	0	3
4	U24EM152	Programming in Practice Laboratory	0	0	2	1
5	U24EM2XX	Internship / Practical Training / Value Added Course(s)	2	0	2	3
6	U24EM301	Value Added Course – Community Engagement and Social Responsibility	1	0	2	2
7	U24EM3XX	Skill Development/ Value Added Course(s)	1	0	2	2
8	U24EM401	Project Phase – I	0	0	8	4
9	U24EM451	Project Phase – II	0	0	16	8
Total			10	0	34	27

Online Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24CS8XX	Online Course – I	3	0	0	3
2	U24CS8XX	Online Course – II	3	0	0	3
Total			6	0	0	6

Audit Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24AUXXX	Audit Course – I	-	-	-	-
2	U24AUXXX	Audit Course – II	-	-	-	-
3	U24AUXXX	Audit Course – III	-	-	-	-
4	U24AUXXX	Audit Course – IV	-	-	-	-