

B. Tech (CSE (Data Science)) - CURRICULUM (KITSW-URR24)
SEMESTER-WISE CURRICULUM WITH SCHEME OF INSTRUCTIONS

Abbreviations

L	Lecture Hour	O	Outside the Class Work (Self Study) Hours			
T	Tutorial Hour	E	Total Engagement in Hours			
P	Practical Hour	C	Credit Assigned			

I SEMESTER

Stream - II

S. No.	Category	Course Code	Course Title	Lectures / week					Credits		
				L	T	P	O	E			
-	IKSC	U24IK100	AICTE Mandated Student Induction Programme (Universal Human Values - I)								-
1	BSC	U24MH101	Differential Calculus and Ordinary Differential Equations	2	1	-	6	9	3		
2	BSC	U24CY102B	Engineering Chemistry (for CSD)	2	1	2	5	10	4		
3	ESC	U24EC111	Switching Theory and Logic Design	2	1	-	4	7	3		
4	ESC	U24DS104	Programming for Problem Solving with C	2	1	2	5	10	4		
5	HSMC	U24MH105	English Communication and Report Writing	2	-	-	3	5	2		
6	VAC	U24VA106	Sports & Yoga	-	-	2	2	4	1		
7	ESC	U24ME107	Engineering Graphics Through CAD	-	-	2	2	4	1		
8	ELC	U24EL108	Practicum-I	-	-	-	4	4	1		
9	VAC	U24VA109X XXXX	SEA - I / SAA-I	-	-	-	2	2	1		
10	AEC	U24AE110	Expert Talk Series-1	-	-	-	1	1	1		
Total:				10	4	8	34	56	21		
Summer/ Inter-semBridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL							

Pool - III (Chemistry)		
S. No.	Course Code	Course Title
1.	U24CY102A	Engineering Chemistry (for Mechanical Engineering)
2.	U24CY102B	Engineering Chemistry (Common to CSM, CSD, CSN, CSO & IT)

II SEMESTER
Stream-II

S. No.	Category	Course Code	Course Title	Lectures / week					Credits	
				L	T	P	O	E		
1	BSC	U24MH201	Matrix Theory and Vector Calculus	2	1	-	6	9	3	
2	BSC	U24PY202B	Engineering Physics (for CSD)	2	1	2	5	10	4	
3	PCC	U24DS203	Computer Architecture and Organization	2	1	-	4	7	3	
4	ESC	U24DS204	Data Structures through C	2	1	2	5	10	4	
5	ESC	U24EE205B	Basic Electrical Engineering (for CSD)	2	1	2	5	10	4	
6	VAC	U24CY206	Environmental Studies	2	-	-	2	4	-	
7	AEC	U24AE207	Idea Lab Makerspace	-	-	2	2	4	1	
8	SEC	U24SE208	Programming Skill Development (PSD) Lab - 1	-	-	2	2	4	1	
9	ELC	U24EL209	Practicum-2	-	-	-	4	4	1	
10	VAC	U24VA210X XXXX	SEA-2 / SAA -2	-	-	-	2	2	1	
11	AEC	U24AE211	Expert Talk Series-2	-	-	-	1	1	1	
				Total:	12	5	10	38	65	23
Summer/ Inter-semBridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL						

Pool – I (Physics)		
S. No.	Course Code	Course Title
1.	U24PY202A	Engineering Physics (for Mechanical Engineering)
2.	U24PY202B	Engineering Physics (Common to CSM, CSD, CSN, CSO & IT)

Pool – II (Basic Electrical & Electronics Engineering)		
S. No.	Course Code	Course Title
1.	U24EE205A	Basic Electrical and Electronics Engineering (for Mechanical Engineering)
2.	U24EE205B	Basic Electrical Engineering (Common to CSM, CSD, CSN, CSO & IT)

Bridge Courses for exit:

Successful completion of two subjects (6-Credits) during 2-months internship at the institute
OR

Successful completion of two suitable skill based courses (external) to qualify for Certification

A. After First Year: (UG Certificate in CSE(Data Science))

(i) The candidate should pass any two of the following additional courses (ITI Level) during the 2-Months internship at institute

III SEMESTER

S. No.	Category	Course Code	Course Title	Lectures / week					Credits
				L	T	P	O	E	
1	BSC*	U24MH301F*	Essential Mathematics and Statistics for Data Science*	2	1	-	6	9	3
2	PCC	U24DS302	Advanced Data Structures	2	1	2	5	10	4
3	PCC	U24DS303	Operating Systems	2	1	-	5	8	3
4	PCC	U24DS304	Automata Theory and Compiler Design	2	1	-	4	7	3
5	PCC	U24DS305	Object Oriented Programming through Java	2	1	2	5	10	4
6	VAC*	U24VA306B*	Soft & Interpersonal Skills*	2	-	-	2	4	1
7	SEC	U24SE307	Programming Skill Development (PSD) Lab - 2	-	-	2	2	4	1
8	ELC	U24EL308	Practicum-3	-	-	-	4	4	1
9	VAC	U24VA309XX XXX	SEA-3 / SAA -3	-	-	-	2	2	1
10	AEC	U24AE310	Expert Talk Series-3	-	-	-	1	1	1
Total:				12	5	6	36	59	22
Summer/ Inter-semBridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				"Programming in C" bridge course for Non-CS/IT Lateral Entry students					

* Branch Specific Mathematics:

Branch Specific Mathematics (Pool-4)		
S. No.	Course Code	Course Title
1.	U24MH301A	Numerical and Statistical Methods <i>(for Civil Engineering)</i>
2.	U24MH301B	Applied Mathematics <i>(for Mechanical Engineering)</i>
3.	U24MH301C	Applied Mathematics <i>(Common to ECI, EEE & ECE)</i>
4.	U24MH301D	Discrete Mathematics and Probability Statistics <i>(Common to CSE, CSN, CSO & IT)</i>
5.	U24MH301E	Essential Mathematics and Statistics for Machine learning <i>(for CSM)</i>
6.	U24MH301F	Essential Mathematics and Statistics for Data science <i>(for CSD)</i>

* VAC (Value Added Course):

T&P Basket		
S. No.	Course Code	Course Title
1.	U24VA306A	Quanitative Aptitude and Logical Reasoning
2.	U24VA306B	Soft & Interpersonal Skills

* Dean AA will allot the courses QALR(Stream-I), Soft & Interpersonal Skills(Stream-II), to the branches as per Stream-I and Stream-II.

IV SEMESTER

S. No.	Category	Course Code	Course Title	Lectures / week					Credits
				L	T	P	O	E	
1	PCC	U24DS401	Database Management Systems	2	1	2	5	10	4
2	PCC	U24DS402	Artificial Intelligence	2	1	-	5	8	3
3	PCC	U24DS403	Software Engineering	2	1	-	4	7	3
4	PCC	U24DS404	Computer Networks	2	1	-	4	7	3
5	PCC	U24DS405	Python Programming	2	1	2	5	10	4
6	VAC*	U24VA406A*	Quantitative Aptitude and Logical Reasoning*	2	-	-	2	4	2
7	SEC	U24SE407	Programming Skill Development (PSD) Lab-3	-	-	2	2	4	1
8	ELC	U24EL408	Practicum-4	-	-	-	4	4	1
9	VAC	U24VA409XX XXX	SEA-4 / SAA-4	-	-	-	2	2	1
10	AEC	U24AE410	Expert Talk Series-4	-	-	-	1	1	1
11	VAC*	U24CY411*	Environmental Studies*	2*	1*	-	2*	5*	3*
Total:				12	5	6	34	62	23
Summer/ Inter-semBridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL					

*For Lateral Entry Students Only

* VAC (Value Added Course):

T&P Basket		
S. No.	Course Code	Course Title
1.	U24VA406A	Quanitative Aptitude and Logical Reasoning
2.	U24VA406B	Soft & Interpersonal

@ Dean AA will allot the courses QALR (Stream-II), Soft and Interpersonal Skills (Stream-I), to the branches as per Stream-I and Stream-II.

Bridge Courses for exit:

Successful completion of two subjects (6-Credits) during 2-months internship at the institute
OR

Successful completion of two suitable skill based courses (external) to qualify for Certification

B. After Second Year: (UG Diploma in CSE (Data Science))

(i) The candidate should pass any two of the following additional courses (Diploma Level) during the 2-Months internship at institute

Exit Option to Qualify UG Diploma in CSE (Data Science): Any Two (02) Courses during the 2 - Months internship							
S. No.	Category	Course Code	Course Title	L	T	P	C
1	PCC	U24DS412X	Machine Learning	2	-	2	4
2	PCC	U24DS413X	Computer Vision and Image Processing	2	-	2	4
3	PCC	U24DS414X	Data Warehousing and Data Mining	2	-	2	4
4	PCC	U24DS415X	Web Technologies	2	-	2	4
5	PCC	U24DS416X	Any other course approved by BoS Chair and Dean AA	2	-	2	4

(OR)

V SEMESTER

S. No.	Category	Course Code	Course Title	Lectures / week					Credits
				L	T	P	O	E	
1	MOPEC	U24OE501YYX	MOPEC Elective -I#	2	1	-	3	6	3
2	PCC	U24DS502	Web Programming	2	1	2	5	10	4
3	PCC	U24DS503	Design and Analysis of Algorithms	2	1	-	4	7	3
4	PCC	U24DS504	Machine Learning	2	1	2	5	10	4
5	HSMC	U24MB505X	Management Basket*	2	1	-	2	5	3
6	IKSC	U24IK506B	Universal Human Values-II	2	-	-	2	4	2
7	SEC	U24DS507	Programming Skill Development (PSD) Lab - 4	-	-	2	2	4	1
8	HSMC	U24MH508	Technical English	-	-	2	2	4	1
9	ELC	U24DS509	Seminar	-	-	-	2	2	1
10	AEC	U24AE510	Expert Talk Series-5	-	-	-	1	1	1
Total:				12	5	8	28	53	23
Additional Learning®:Maximum credits allowed for Honours/Minor				-	-	-	-	-	5
Total credits for Honours/Minor students:				-	-	-	-	-	28
Summer/ Inter-semBridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL					

#MULTIDISCIPLINARY OPEN ELECTIVES (MOPEC): Student has to select one course as multidisciplinary open elective from any of the MOPEC Basket of courses offered by other departments.

* Dean AA will allot the courses S&E Basket (Stream-I), Management Course Basket (Stream-II), to the branches as per Stream-I and Stream-II.

®List of courses for additional learning through MOOCs towards Honours/Minor in Engineering shall be prescribed by the department under Honours/ Minor Curricula

Management Courses Basket		
S. No.	Course Code	Course Title
1.	U24MB505A	Management Economics and Accountancy
2.	U24MB505B	Industrial Psychology
3.	U24MB505C	E-Commerce and Digital Marketing
4.	U24MB505D	Organizational Behaviour
5.	U24MB505E	Any other course approved by BoS Chair and Dean AA

VI SEMESTER

S. No.	Category	Course Code	Course Title	Lectures / week					Credits
				L	T	P	O	E	
1	PEC	U24DS601X	Program Elective -I/ MOOCs-I	2	1	-	3	6	3
2	PCC	U24DS602	Computer Vision & Image Processing	2	1	-	4	7	3
3	PCC	U24DS603	Machine Learning	2	1	2	4	9	4
4	PCC	U24DS604	DevOps	2	1	2	5	10	4
5	STE	U24ST605X	Startups & Entrepreneurship Basket*	2	1	-	2	5	3
6	IKSC	U24IK606B	Essence of Indian Traditional Knowledge	2	-	-	2	4	2
7	SEC	U24DS607	Programming Skill Development (PSD) Lab - 5	-	-	2	2	4	1
8	ELC	U24DS608	Mini Project	-	-	2	2	4	1
9	AEC	U24AE609	Expert Talk Series-6	-	-	-	1	1	1
Total:				12	5	8	25	50	22
Additional Learning®:Maximum credits allowed for Honours/Minor				-	-	-	-	-	5
Total credits for Honours/Minor students:				-	-	-	-	-	27
Summer/ Inter-semBridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL					

[®]List of courses for additional learning through MOOCs towards Honours/Minor in Engineering shall be prescribed by the department under Honours/ Minor Curricula

B. Tech Honours with Research:

Students opting for B. Tech Honours with Research, shall undergo a 2-Month Mandatory Research Internship-II(5 Credits) at respective department during the summer vacation after VI Semester.

Startups & Entrepreneurship Basket		
S. No.	Course Code	Course Title
1.	U24ST605A	Design Thinking
2.	U24ST605B	Innovative Product Design and Development
3.	U24ST605C	Entrepreneurship
4.	U24ST605D	Design Studio
5.	U24ST605E	Any other course approved by BoS Chair and Dean AA

Bridge Courses for exit:

Successful completion of two subjects (6-Credits) during 2-months internship at the institute

OR

Successful completion of two suitable skill based courses (external) to qualify for Certification

VII SEMESTER

S. No.	Category	Course Code	Course Title	Lectures / week					Credits
				L	T	P	O	E	
1	MOPEC	U24OE701YYX	MOPEC Elective -II	2	1	-	3	6	3
2	PEC	U24DS702X	Program Elective - II/ MOOCs-II	2	1	-	4	7	3
3	PCC	U24DS703	Big Data Analytics	2	1	2	4	7	4
4	PCC	U24DS704	Cloud Computing	2	1	-	4	7	3
5	PCC	U24DS705	Ethical Hacking	2	1	-	4	7	3
6	ELC	U24DS706	Internship Evaluation*	-	-	2	-	2	1
7	ELC	U24DS707	Major Project, Phase-1/ Industrial Internship - 1	-	-	8	6	12	4
Total:				10	5	12	25	50	21
Additional Learning®:Maximum credits allowed for Honours/Minor				-	-	-	-	-	4
Total credits for Honours/Minor students:				-	-	-	-	-	25

#MULTIDISCIPLINARY OPEN ELECTIVES: Student has to select one course as multidisciplinary open elective from any of the MOPEC Basket of courses offered by other departments.

@ List of courses for additional learning through MOOCs towards Honours/Minor in Engineering shall be prescribed by the department under Honours/ Minor Curricula

B. Tech Honours with Research:

Students opting for B. Tech Honours with Research, shall complete Research Methodology Course(4 Credits) through MOOCs (OR) a workshop / FDP of not less than one week on "Research Methodologies" (4 Credits).

Internship Evaluation for the students opting B. Tech Honours with Research, will be done on the 2-Month Research internship-II.

VIII SEMESTER

S. No.	Category	Course Code	Course Title	Lectures / week					Credits
				L	T	P	O	E	
1	MOPEC	U24OE801YYX	MOPEC Elective -III	2	1	-	3	6	3
2	PEC	U24DS802X	Program Elective - III/ MOOCs-III	2	1	-	4	7	3
3	PEC	U24DS803X	Program Elective - IV / MOOCs-IV	2	1	-	4	7	3
4	ELC	U24DS804	Major Project, Phase - 2/ Industrial Internship - 2	-	-	12	4	16	6
Total:				6	3	12	15	36	15
Additional Learning®:Maximum credits allowed for Honours/Minor				-	-	-	-	-	4
Total credits for Honours/Minor students:				-	-	-	-	-	19

#MULTIDISCIPLINARY OPEN ELECTIVES: Student has to select one course as multidisciplinary open elective from any of the MOPEC Basket of courses offered by other departments.

@ List of courses for additional learning through MOOCs towards Honours/Minor in Engineering shall be prescribed by the department under Honours/ Minor Curricula

B. Tech Honours with Research:

Students opting for B. Tech Honours with Research, shall Publish a research paper in reputed journal indexed by SCI / SCOPUS/Web of Science (4 Credits).

SUMMARY

SEMESTER	I	II	III	IV	V	VI	VII	VIII	TOTAL
CREDITS	21	23	22	23	23	22	21	15	170