

AKAL UNIVERSITY

TALWANDI SABOO

(Estb. under Punjab State Act No. 25 of 2015)

FACULTY OF COMPUTER SCIENCE, DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Course Structure B. Tech-CSE Specialization in Data Science and Analytics

Sr. No	Category of Courses	Credits
1	Foundation Core (FC)	75
2	Professional Core (PC)	50
3	Professional Elective (PE)	16
4	Enhancement Skills (EES)	56

L-Lecture
T-Tutorial
P-Practical
J-Project
C-Credit

Sr.NO	Nature of Course	Course Code	Course Title	L	T	P	J	C	Marks			
									Internal	MICQ Exam/Practical File	End Semester Examination	
Semester 1												
1	EES		Communications Skills-I	3	1	0		3	20	20	60	
2	FC		Engineering Physics + Practical	3	1			3	20	20	60	
							3	1	20	20	60	
3	FC		Engineering Chemistry+ Practical	3	1			3	20	20	60	
							3	1	20	20	60	
4	FC		Problem Solving and Programming	3	1	0		3	20	20	60	
5	FC		Problem Solving and Programming Lab	0	0	4		3	20	20	60	
6	FC		Engineering Mathematics I	3	1	0		3	20	20	60	

Total		15	5	10	0	20	160	160	480
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Sr.NO	ature of Cour	Course Code	Course Title	L	T	P	J	C	Marks		
									Internal	MCQ Exam/Practical File	End Semester Examination
Semester 2											
1	EES		Communications Skills-II	3	0	0	0	3	20	20	60
2	FC		Data Structures and Algorithms	4	1	0		4	20	20	60
3	FC		Database Management Systems	4	1	0		4	20	20	60
4	FC		Object Oriented Programming (C++)	3	1	0		3	20	20	60
5	FC		Computer System Architecture	2	1	0		3	20	20	60
6	FC		Object Oriented Programming Lab	0	0	4		2	20	20	60
7	FC		Economics	3	0	0	0	2	20	20	60
8	FC		Engineering Mathematics II	3	1	0		3	20	20	60
Total				22	5	4	0	24	160	160	480

Sr.NO	ature of Cour	Course Code	Course Title	L	T	P	J	C	Marks		
									Internal	MCQ Exam/Practical File	End Semester Examination
Semester 3											
1	FC		Internet and Web Programming	3	1	0		3	20	20	60
2	FC		Relational Database Management System	3	1	0		3	20	20	60
3	PC		Fundamentals of Analytics	4	1	0		4	20	20	60
4	PC		Statistical foundation of Data Science I	4	1	0		4	20	20	60
5	FC		Relational Database Management System Lab	0	0	3		3	20	20	60
6	FC		Software Engineering	4	1	0	0	3	20	20	60
7	FC		Analytics Lab	0	0	3		3	20	20	60
8	EES		MOOC/Seminar/Internships			1		1			
Total				18	5	7	0	24	140	140	420

Sr.NO	ature of Cour	Course Code	Course Title	L	T	P	J	C	Marks		
									Internal	MCQ Exam/Practical File	End Semester Examination
Semester 4											
1	PC		Introduction to Python	3	1	0		3	20	20	60
2	FC		Operating Systems and Linux	4	1	0		3	20	20	60

3	FC		Discrete Mathematics	4	1	0		3	20	20	60
4	PC		Statistical Foundation of Data Science II	4	1	0		4	20	20	60
5	PC		Introduction to Python Lab	0	0	4		3	20	20	60
6	FC		Operating Systems and Linux Lab	0	0	3		3	20	20	60
7	PC		Foundations of Data Science	4	1	0		4	20	20	60
8	EES		*Minor Project				10	10	20	20	60
Total				19	5	7	10	33	160	160	480

Sr.NO	Nature of Cour	Course Code	Course Title	L	T	P	J	C	Marks		
									Internal	MCQ Exam/Practical File	End Semester Examination
Semester 5											
1	FC		Data Communication and Networking	3	1	0		3	20	20	60
2	PC		Data Handling and Visualisation	3	1	0		3	20	20	60
3	PC		Social Media Analytics	3	1	0		3	20	20	60
4	FC		System Software	3	1	0		3	20	20	60
5	FC		Environment Sciences	3	1	0		2	20	20	60
6	PC		Data Handling and Visualisation Lab	0	0	4		3	20	20	60
7	EES		MOOC/Seminar/Internships			1		1			
Total				15	5	5	0	18	120	120	360

Sr.NO	Nature of Cour	Course Code	Course Title	L	T	P	J	C	Marks		
									Internal	MCQ Exam/Practical File	End Semester Examination
Semester 6											
1	PC		Machine Learning-I	3	1	0		3	20	20	60
2	PC		Pattern Recognition	3	1	0		3	20	20	60
3	PE		Professional Elective 1	4	1	0		4	20	20	60
4	PE		Professional Elective 2	4	1	0		4	20	20	60
5	FC		Computer Graphics	3	1	0		3	20	20	60
6	FC		Computer Graphics LAB	0	0	4		2	20	20	60
7	PC		Machine Learning Lab I	0	0	3		3	20	20	60
8	EES		MOOC/Seminar/Internships			1		1			
Total				17	5	8	0	23	140	140	420

Sr.NO	Nature of Cour	Course Code	Course Title	L	T	P	J	C	Marks		
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Semester 7								Internal	MCQ Exam/Practical File	End Semester Examination	
1	FC		Engineering Ethics	3	1	0		3	20	20	60
2	PC		Machine Learning-II	4	1	0		4	20	20	60
3	PC		Information Security and Privacy	3	1	0		3	20	20	60
4	PE		Professional Elective 3	4	1	0		4	20	20	60
5	PE		Professional Elective 4	4	1	0		4	20	20	60
6	PC		Machine Learning Lab II	0	0	3		3	20	20	60
7	EES		MOOC/Seminar/Internships			1		1			
Total				18	5	4	0	22	120	120	360

Sr.NO	ature of Cour	Course Code	Course Title	L	T	P	J	C	Marks		
Semester 8								Internal	MCQ Exam/Practical File	End Semester Examination	
1	EES		Project and Industrial Training	0	0	0	32	32			200
Total				0	0	0	32	32	0	0	200

Professional Electives											
1	PE		Large Scale Data Processing	4	1	0					4
2	PE		Natural Language Processing3	4	1	0					4
3	PE		Data Mining	4	1	0					4
4	PE		Digital Image Processing	4	1	0					4
5	PE		Interent of Things	4	1	0					4
6	PE		Cloud Computing	4	1	0					4
7	PE		Java Programming	4	1	0					4
8	PE		System Simulations	4	1	0					4
9	PE		Secure Data Analytics	4	1	0					4
10	PE		Buisness Intelligence	4	1	0					4
11	PE		Introduction to IOT	4	1	0					4
12	PE		Data Governance	4	1	0					4
13	PE		Soft Computing	4	1	0					4
14	PE		Information Retrieval	4	1	0					4
15	PE		Information System	4	1	0					4

16	PE		Intelligent Systems	4	1	0		4
17	PE		Artificial Intelligence	4	1	0		4
18	PE		Deep Learning	4	1	0		4
19	PE		Reinforcement Learning	4	1	0		4
20	PE		Web Analytics	4	1	0		4

