

**Curriculum of B.Sc. Engineering Honours Degree Programme
Department of Computer Science and Engineering
Data Science and Engineering (DSE) Stream**

Module Code	Module Name	Category	Lectures hrs/week	Lab/Assignment hrs/weeks	Credits		Norm		Evaluation		
					GPA	NGPA	GPA	NGPA	CA		
Semester 1											
MA1013	Mathematics	C	3.0	1/1	3.0					20	
CS1032	Programming Fundamentals	C	2.0	3/1	3.0					20	
ME1032	Mechanics	C	2.0	3/4	2.0					20	
MT1022	Properties of Materials	C	2.0	3/4	2.0					20	
CE1022	Fluid Mechanics	C	2.0	3/4	2.0					20	
EE1012	Electrical Engineering	C	2.0	3/4	2.0					20	
EL1012	Language Skill Enhancement I	C	-	3/1	1.0			15.0		20	
MN1012	Engineering in Context	C	1.0	-			1.0		1.0	30	
					Total for Semester 1				15.0	1.0	
Semester 2											
CS2012	Principles of Object Oriented Programming	E	2.0	3/1	3.0					40	
CS2222	Principles of Embedded Systems Programming	E	2.0	3/1	3.0			3.0		40	
CS2022	Data Structures and Algorithms	C	2.0	3/2	2.5					40	
CS2052	Computer Architecture	C	2.0	3/1	3.0					40	
EN1012	Electronic Devices and Circuits	C	2.0	-	2.0					40	
MA1032	Numerical Methods for Computer Science	C	3.0	-	3.0					30	
EE2093	Theory of Electricity	C	2.0	-	2.0					30	
ME1802	Introduction to Manufacturing Engineering	C	2.0	3/2	2.5					30	
CS2952	Communication Skills	C	0.5	3/1	1.5			16.5		80	
CS1962	Engineering Skill Development	C	0.5	3/1			1.5		1.5	100	
					Total for Semester 2				19.5	1.5	

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Semester 3										
CS2062	Object Oriented Software Development	E	2.0	3/1	3.0					40
CS2242	Embedded Software Development	E	2.0	3/1	3.0		3.0			40
CS2032	Principles of Computer Communication	C	2.0	3/1	3.0					40
CS2042	Operating Systems	C	2.0	3/2	2.5					40
EN2022	Digital Electronics	C	2.0	3/2	2.5					30
CE1822	Aspects of Civil Engineering	C	2.0	-	2.0					30
ME1822	Basic Engineering Thermodynamics	C	1.5	3/2	2.0					30
CS2150	Graph Theory for Computing	C	2.0	-	2.0					30
MA2073	Calculus for System Modelling	C	2.0	-	2.0		16.0			30
CS2202	Programming Challenge I	E	-	3/1		1.0				100
CS2972	Automation Challenge I	E	-	3/1		1.0		1.0		100
CS2963	Presentation Skills	C	-	3/1		1.0		1.0		100
Total for Semester 3								19.0	2.0	
Semester 4										
CS3022	Software Engineering	C	2.0	3/1	3.0					40
CS3120	Introduction to Data Science	C	2.0	3/1	3.0					40
CS3110	Introduction to Machine Learning	C	2.0	3/1	3.0					40
CS3042	Database Systems	C	2.0	3/1	3.0					40
MA2033	Linear Algebra	C	2.0	-	2.0					30
MA2063	Differential Equations and Applications	C	2.0	-	2.0		16.0			30
CS2500	Data Science and Engineering Challenge	C	-	3/1		1.0				100
CS3953	Technical Writing	C	0.5	3/1		1.5		2.5		100
DE2xxx	Humanities Elective I	E				2.0		2.0		
Total for Semester 4								18.0	2.5	

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Semester 5										
CS3500	Data Science and Engineering Project	C		15/2	2.5				100	
CS3062	Theory of Computing	C	2.0	-	2.0				40	
CS3612	Intelligent Systems	C	2.0	3/1	3.0				40	
CS3620	Data Mining	C	2.0	3/1	3.0				40	
CS3630	Deep Neural Networks	C	2.0	3/1	3.0				40	
CS3130	Computer Networks and Security	C	2.0	3/1	3.0				40	
MN3042	Business Economics & Financial Accounting	C	3.0	-	3.0				30	
MA3013	Applied Statistics	C	2.0	-	2.0			21.5	30	
Total for Semester 5									21.5	0.0
Industrial Training										
CS3992	Industrial Training	C	-	-		6.0		6.0	100	
Total for Industrial Training									0.0	6.0
Semester 6										
CS4012	Professional Practice	C	2.0	-	2.0				30	
CS3962	Research and Report Writing	C	0.5	3/2	1.0		3.0		80	
CS3750	Data Visualization	E	2.0	3/1	3.0				50	
CS3312	Embedded System Design	E	2.0	3/1	3.0				30	
CS4232	Formal Methods in Software Engineering	E	2.0	3/1	3.0				50	
CS4242	Human Computer Interaction	E	2.0	3/1	3.0				40	
CS4532	Concurrent Programming	E	2.0	3/1	3.0				40	
CS4742	Bioinformatics	E	2.0	3/1	3.0		3.0		40	
DE2xxx	Humanities Elective II	E			2.0		2.0			
Total for Semester 6									8.0	0.0

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Semester 7									
CS4202	Research and Development Project	C			5.0				100
CS4670	Business Analytics in Organizational Performance Management	C	2.0	3/1	3.0		8.0		40
CS4222	Software Process and Management	E	2.0	3/1	3.0				50
CS4232	Formal Methods in Software Engineering	E	2.0	3/1	3.0				50
CS4242	Human Computer Interaction	E	2.0	3/1	3.0				40
CS4252	Advanced Operating Systems	E	2.0	3/1	3.0				50
CS4262	Distributed Systems	E	2.0	3/1	3.0				50
CS4272	Quality Engineering	E	2.0	3/1	3.0				50
CS4322	Digital System Design	E	2.0	3/1	3.0				40
CS4332	Computer Aided Digital Design	E	2.0	3/1	3.0				40
CS4342	Advanced Computer Architecture	E	2.0	3/1	3.0				40
CS4352	Robotics and Automation	E	2.0	3/1	3.0				50
CS4362	Hardware Description Languages	E	2.0	3/1	3.0				40
CS4372	Machine Vision	E	2.0	3/1	3.0				40
CS4432	Network and System Administration	E	2.0	3/1	3.0				40
CS4442	Current Trends in Networking	E	2.0	3/1	3.0				50
CS4452	Information Security & Cryptography	E	2.0	3/1	3.0				50
CS4462	Computer & Network Security	E	2.0	3/1	3.0				50
CS4472	Mobile Computing	E	2.0	3/1	3.0				50
CS4482	High Performance Networking	E	2.0	3/1	3.0				40
CS4492	Wireless and Broadband Networking	E	2.0	3/1	3.0				40
CS4522	Advanced Algorithms	E	2.0	3/1	3.0				40
CS4532	Concurrent Programming	E	2.0	3/1	3.0				40
CS4542	Compiler Design	E	2.0	3/1	3.0				40
CS4552	Scientific Computing	E	2.0	3/1	3.0				40
CS4632	Database Internals	E	2.0	3/1	3.0				40
CS4722	Computer Vision	E	2.0	3/1	3.0				40

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CS4732	Computer Graphics	E	2.0	3/1	3.0			40	
CS4742	Bioinformatics	E	2.0	3/1	3.0			40	
CS4752	Advanced Numerical Analysis	E	2.0	3/1	3.0			30	
CS4650	Big Data Analytics	E	2.0	3/1	3.0			40	
CS4660	Natural Language Processing	E	2.0	3/1	3.0		9.0	40	
Total for Semester 7								17.0	0.0
Semester 8									
CS4202	Research and Development Project	C			5.0			100	
CS4680	Advanced Machine Learning	C	2.0	3/1	3.0			50	
CS4690	Advanced Artificial Intelligence	C	2.0	3/1	3.0			50	
MN4122	Human Resource Management & Industrial Relations	C	2.0	-	2.0		13.0	30	
CS4222	Software Process and Management	E	2.0	3/1	3.0			50	
CS4232	Formal Methods in Software Engineering	E	2.0	3/1	3.0			50	
CS4242	Human Computer Interaction	E	2.0	3/1	3.0			40	
CS4252	Advanced Operating Systems	E	2.0	3/1	3.0			50	
CS4262	Distributed Systems	E	2.0	3/1	3.0			50	
CS4272	Quality Engineering	E	2.0	3/1	3.0			50	
CS4322	Digital System Design	E	2.0	3/1	3.0			40	
CS4332	Computer Aided Digital Design	E	2.0	3/1	3.0			40	
CS4342	Advanced Computer Architecture	E	2.0	3/1	3.0			40	
CS4352	Robotics and Automation	E	2.0	3/1	3.0			50	
CS4362	Hardware Description Languages	E	2.0	3/1	3.0			40	
CS4372	Machine Vision	E	2.0	3/1	3.0			40	
CS4432	Network and System Administration	E	2.0	3/1	3.0			40	
CS4442	Current Trends in Networking	E	2.0	3/1	3.0			50	
CS4452	Information Security & Cryptography	E	2.0	3/1	3.0			50	
CS4462	Computer & Network Security	E	2.0	3/1	3.0			50	
CS4472	Mobile Computing	E	2.0	3/1	3.0			50	

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CS4482	High Performance Networking	E	2.0	3/1	3.0			40
CS4492	Wireless and Broadband Networking	E	2.0	3/1	3.0			40
CS4522	Advanced Algorithms	E	2.0	3/1	3.0			40
CS4532	Concurrent Programming	E	2.0	3/1	3.0			40
CS4542	Compiler Design	E	2.0	3/1	3.0			40
CS4552	Scientific Computing	E	2.0	3/1	3.0			40
CS4632	Database Internals	E	2.0	3/1	3.0			40
CS4722	Computer Vision	E	2.0	3/1	3.0			40
CS4732	Computer Graphics	E	2.0	3/1	3.0			40
CS4742	Bioinformatics	E	2.0	3/1	3.0	3.0		40
MA4013	Linear Models and Multivariate Statistics	E	3.0	-	3.0			30
MA4023	Operational Research	E	3.0	-	3.0			30
MA4033	Time Series & Stochastic Process	E	3.0	-	3.0			30
MA4053	Numerical Analysis for Scientific Computing	E	3.0	-	3.0			30
CS4752	Advanced Numerical Analysis	E	2.0	3/1	3.0	3.0		30
Total for Semester 8							19.0	0.0
Total for the Programme							137.0	13.0