Course Structure for B. Tech. Mathematics & Computing (2024 &2025) under NEP 2020

School of Mathematics

First Year
Semester-I

Course Type	Course Code	Course Title	L	T	P/S	Credits
BSC 1	MTL BS101	Engineering Mathematics-I	3	1	0	4
BSC 2	PHL BS101	Engineering Physics	3	0	0	3
BSC 2	PHP BS101	Engineering Physics Lab	0	0	2	1
ESC 1	CSL ES101	Introduction to C Programming	3	0	0	3
ESC 1	CSP ES101	C Programming Lab	0	0	2	1
ESC 2	ECL ES103	Digital Electronics	3	0	0	3
ESC 2	ECP ES103	Digital Electronics Lab	0	0	2	1
SEC 1	MEM SE103	Engineering Graphics with CAD	1	0	2	2
AEC 1 / VAC 1		Ability Enhancement /Value Added Course				2
		Total Credits				**20**

Semester II

Course Type	Course Code	Course Title	L	T	P/S	Credits
BSC 3	MTL BS 102	Engineering Mathematics-II	3	1	0	4
BSC 4	BTL BS102	Biology for Engineers	3	0	0	3
DCC 1	CSL DC102	Programming using Python	3	0	0	3
DCC 1	CSP DC102	Python Programming Lab	0	0	2	1
DCC 2	MTL DC102	Modern Algebra	3	1	0	4
SEC 2	MEM SE102	Engineering Workshop	1	0	2	2
AEC 2		Ability Enhancement Course				2
VAC 2		Value Added course				2
MAC 1	PCN MA102	Universal Human Values-II	2	0	0	0
		Total Credits				**21**

Second Year						
3rd Semester						
Course Type	**Course Code**	**Course Title**	**L**	**T**	**P/S**	**Credits**
BSC 5	MTL BS201	Discrete Mathematics	3	0	0	3
ESC 3	ECL ES205	Microprocessor and Interfacing	3	0	0	3
ESC 3	ECP ES205	Microprocessor and Interfacing Lab	0	0	2	1
DCC 3	CSL DC207	Data Structures	3	0	0	3
DCC 3	CSP DC207	Data Structures Lab	0	0	2	1
DCC 4	MTL DC203	Integral Transforms and Complex Analysis	3	1	0	4
DCC 5	MTL DC205	Probability & Statistics	3	1	0	4
SEC 3		Skill Enhancement Course 3				2
PR	CSI PR203	Summer Internship - I				1
VAC 3		Value Added Course	2	0	0	2
		Total Credits				**24**
		4th Semester				
Course Type	**Course Code**	**Course Title**	**L**	**T**	**P/S**	**Credits**
DCC 6	CSL DC214	Algorithm Design & Analysis	3	1	0	4
DCC 7	MTL DC202	Real Analysis	3	1	0	4
DCC 8	CSL DC212	Theory of Computation	3	1	0	4
DCC 9	CSL DC208	Computer Organization & Architecture	3	1	0	4
DCC 10	MTL DC204	Linear Algebra and Applications	3	1	0	4
VAC 4		Value Added Course	2	0	0	2
		Total Credits				**22**

Third Year						
5th Semester						
Course Type	**Course Code**	**Course Title**	**L**	**T**	**P/S**	**Credits**
DCC 11	CSL DC307	Operating System	3	0	0	3
DCC 11	CSP DC307	Operating System Lab	0	0	2	1
DCC 12	MTL DC301	Number Theory	3	1	0	4
DCC 13	MTL DC303	Stochastic Processes	3	1	0	4
DEC 1		School Elective -I	3	0/1	2/0	4
DEC 2 / GEC 1		School Elective –II/ Generic Elective I	3	0/1	2/0	4
PR	CSI PR303	Summer Internship - II				1
DCC	CSD PR301	Project work 1	0	0	4	2
		Total Credits				**23**
DEC/GEC (Additional)		For Earning Honors/minor Specialization				**4**
DEC/GEC (Additional)		For Earning Honors/minor Specialization				**4**
6th Semester						
Course Type	**Course Code**	**Course Title**	**L**	**T**	**P/S**	**Credits**
DCC 14	CSL DC310	Machine Learning	3	0	0	3
DCC 14	CSP DC310	Machine Learning Lab	0	0	2	1
DCC 15	CSL DC308	Data Base Management System	3	0	0	3
DCC 15	CSP DC308	Data Base Management System Lab	0	0	2	1
DEC 3		School Elective – III	3	1/0	0/2	4
DEC 4 / GEC 2		School Elective –IV/ Generic Elective II	3	1/0	0/2	4
AEC		Management Course/ Entrepreneurship/Economy	3	0	0	3
DCC	CSD PR304	Project Work –II				2
MAC 2	PCN MA302	Indian Knowledge System	2	0	0	0
		Total Credits				**21**
DEC/GEC (Additional)		For Earning Honors/minor Specialization				**4**
DEC/GEC (Additional)		For Earning Honors/minor Specialization				**4**

Fourth Year						
7th Semester						
Course Type	**Course Code**	**Course Title**	**L**	**T**	**P/S**	**Credits**
DCC 16	MTL DC401	Optimization Techniques	3	1	0	4
DEC 5		School Elective – V	3	1/0	0/2	4
DEC 6 / GEC 3		School Elective –VI/ Generic Elective III	3	1/0	0/2	4
PR	CSI PR403	Summer Internship – III				2
DCC/PR	CSD PR403	Project Work –III				4
		Total Credits				**18**
DEC/GEC (Additional)		For Earning Honors/minor Specialization				**4**
DEC/GEC (Additional)		For Earning Honors/minor Specialization				**4**
8th Semester						
Course Type	**Course Code**	**Course Title**	**L**	**T**	**P/S**	**Credits**
DCC/PR	CSD PR404 / CSI PR404	Major Project / Internship (Industrial or In-house Project)				10
		Total Credits				**10**

List of School Electives Courses

S. No.	Subject Code	Subject	Elective No.
1.	MTL DE 301	Operations Research	SEC– 1
2.	CSL DE 327	Object Oriented programming	
3.	MTL DE 303	Complex Analysis	
4.	CSL DE 329	Computer Networks	SEC – 2
5.	CSL DE 331	Software Engineering	
6.	CSL DE 333	Artificial Intelligence	
7.	MTL DE 305	Partial Differential Equations	
8.	CSL DE 324	Computer Graphics	SEC– 3
9.	CSL DE 326	Web Technology	
10.	CSLDE 328	Cluster & Grid Computing	
11.	CSL DE 330	Big Data Analytics	
12.	MTL DE 302	Statistical Inference	

13.	CSL DE 332	Data Warehousing & Data Mining	SEC – 4
14.	CSL DE 334	Compiler Design	
15.	CSL DE 336	Wireless & Mobile Computing	
16.	CSL DE 338	Multimedia System	
17.	MTL DE 304	Topology	
18.	MTL DE 401	Matrix Computation	SEC– 5
19.	MTL DE 403	Modern Applied Algebra	
20.	MTL DE 405	Dynamical Systems	
21.	MTL DE 407	Functional Analysis	
22.	CSL DE 417	Immersive Computing	SEC– 6
23.	MTL DE 409	Information Theory & Coding	
24.	MTL DE 411	Finite element methods	
25.	MTL DE 413	Game Theory	
26.	MTL DE 415	Differential Geometry	

Basket of Courses for B. Tech. Mathematics and Computing (Honors) Specialization in Computational Mathematics and Artificial Intelligence

Course Type	Semester	Course Code	Course Title	L	T	P/S	Credits
DEC	V	MTL DE301	Numerical Methods for Computing	3	1	0	4
DEC	V	MTL DE303	Econometrics	3	1	0	4
DEC	V	CSM DE311	Data Visualization	3	0	2	4
DEC	V	CSL DE315	Cloud Computing	3	1	0	4
DEC	VI	MTL DE 302	Graph Theory for Engineering Applications	3	1	0	4
DEC	VI	MTL DE304	Financial Mathematics	3	1	0	4

DEC	VI	CSL DE320	High Performance Computing	3	1	0	4
DEC	VI	CSM DE310	Internet of Things	3	0	2	4
DEC	VII	MTL DE401	Coding Theory with Applications	3	1	0	4
DEC	VII	MTL DE403	Advanced Partial Differential Equations	3	1	0	4
DEC	VII	CSL DE401	Nature Inspired Algorithms	3	1	0	4
DEC	VII	CSL DE413	Natural Language Processing	3	1	0	4

Note: From semester V onwards, each student opting for honors specialization in Computational Mathematics and Artificial Intelligence has to choose two courses from this basket in each semester, one course which is offered by the School of Mathematics and the other which is offered by the School of Computer Science and Engineering.