Annexure-I

Sardar Vallabhbhai National Institute of Technology (SVNIT) Surat
Department of Mathematics
Bachelor of Technology in Mathematics and Computing (MaC)

Sr. No.	Subject	Code	Scheme L-T-P	Credits (Min.)	Notional hours of Learning (Approx.)
	First Semester (1st year of B.Tech. MaC)				
1	Foundation Course in Mathematics	MA125	3-1-0	4	70
2	Calculus	MA127	3-1-0	4	70
3	Computer Programming using C/C++	MA131	3-0-2	4	85
4	English and Professional Communication	HS110	3-1-0	4	70
5	Engineering Physics	EP109	3-0-2	4	85
			Total	**20**	**380**
6	Vocational Training / Professional Experience (Optional) (mandatory for exit)	MAV01 / MAP01	0-0-10	5	200 (20 x 10)
	Second Semester (1st year of B.Tech. MaC)				
1	Foundation Course in Algebra	MA122	3-1-0	4	70
2	Advanced Calculus	MA124	3-1-0	4	70
3	Fundamentals of Python Programming	MA134	3-0-2	4	85
4	Digital Electronics and Logic Design	EC106	3-0-2	4	85
5	Probability and Statistics	MA136	3-1-0	4	70
6	Indian Value System and Social Consciousness	HU120	2-0-0	2	35
			Total	**22**	**415**
7	Vocational Training / Professional Experience (Optional) (mandatory for exit)	MAV02 / MAP02	0-0-10	5	200 (20 x 10)
	Third Semester (2nd year of B.Tech. MaC)				
1	Element of Analysis	MA201	3-1-0	4	70
2	Discrete Mathematics for Computing	MA207	3-1-0	4	70
3	Data Structure and algorithm	MA233	3-0-2	4	85
4	Elective-I	MA2AA	3-0-1/ 3-0-2	4	70/85
5	Database Management System	MA235	3-0-2	4	85
			Total	**20**	**380/395**
	Fourth Semester (2nd year of B.Tech. MaC)				
1	Numerical Analysis	MA202	3-1-0	4	70
2	Computational Linear Algebra	MA206	3-1-0	4	70
3	Elementary Number theory	MA234	3-1-0	4	70
4	Elective-II	MA2BB	3-0-1/ 3-0-2	4	70/85
5	Design and Analysis of Algorithms	MA236	3-0-2	4	85
			Total	**20**	**365/380**
6	Mathematical Software-II/ Mini project-I Vocational Training / Professional Experience (Optional) (mandatory for exit)	MAV04 / MAP04	0-0-10	5	200 (20 x 10)

Subject Code:##nXX; ##: Department Identity, n: Year, XX: Subject Sequence number XX: last digit 0 (subject offered in both ODD and EVEN semesters, XX: 01 to 30 – last digit ODD and EVEN for ODD and EVEN semesters (Mandatory Core), XX: 31 to 50 (Optional Core), XX: 51 to 99 (Elective), Subjects list for Minor and Honor (M/H#1-4), Subjects list for Specialization track (#1-4)EG: Engineering Subject, SC: Science Subject (offered combinedly by departments) (SVNIT Surat)

Annexure-I

Sardar Vallabhbhai National Institute of Technology (SVNIT) Surat
Department of Mathematics
Bachelor of Technology in Mathematics and Computing (MaC)

	Fifth Semester (3rd year of B.Tech. MaC)				
1	Ordinary Differential Equations and computations	MA305	3-0-2	4	85
2	Foundation of Data Science	MA307	3-1-0	4	70
3	Machine Learning	MA334	3-0-2	4	85
4	Elective-III (Open Elective)	MA3AA	3-1-0 3-0-2	4	70/85
5	Elective-IV (Specialization#1)	MA3BB	3-X-X	4	70/85
			Total	**20**	**380-410**
	Sixth Semester (3rd year of B.Tech. MaC)				
1	Optimization Techniques and Computing	MA306	3-0-2	4	85
2	Partial Differential Equation and Computing	MA308	3-0-2	4	85
3	Fundamentals Artificial Intelligence	CS300	3-1-0	4	70
4	Elective-V (Open Elective)	MA3CC	3-1-0 3-2-0	4	70/85
5	Elective-VI (Specialization#2)	MA3DD	3-X-X	4	70/85
6	MOOC Course*		3-0-0/ 3-1-0	3/4	70/85
			Total	**20**	**450-495**
7	Mini Project-II/ Vocational Training / Professional Experience (Optional) (mandatory for exit)	MAV06 / MAP06	0-0-10	5	200 (20 x 10)
	Seventh Semester (4th year of B.Tech. MaC)				
1	Topology and Functional Analysis	MA407	3-1-0	4	70
2	Elective-VII	MA4AA	3-1-0 3-0-2	4	70/85
3	Elective-VIII	MA4BB	3-1-0 3-0-2	4	70/85
4	Elective-IX (Specialization#3)	MA4CC	3-X-X	4	70/85
5	Elective-X (Specialization#4)	MA/CS/AI4DD	3-X-X	4	70/85
			Total	**20**	**350-410**
6	Mini Project-III/ Vocational Training / Professional Experience (Optional) (mandatory for exit)	MAV07 / MAP07	0-0-10	5	200 (20 X 10)
	Eighth Semester (4th year of B.Tech. MaC)				
1	Industrial Internship / Professional Experience (Mandatory)	MA404	0-0-40	20	800 (40 X 20)
			Total	**20**	**800**

*Students will be required to opt any one Massive Open Online Courses (MOOC) course through NPTEL / SWAYAM platform in Semester- VI excluding the courses of the existing curriculum of B.Tech. in Mathematics and Computing programme. Necessary approval from the department is required before the registration of the courses on above platform. The credit of the courses through above platform will be considered as per the norms of the institute.

Subject Code:##nXX; ##: Department Identity, n: Year, XX: Subject Sequence number XX: last digit 0 (subject offered in both ODD and EVEN semesters, XX: 01 to 30 – last digit ODD and EVEN for ODD and EVEN semesters (Mandatory Core), XX: 31 to 50 (Optional Core), XX: 51 to 99 (Elective), Subjects list for Minor and Honor (M/H#1-4), Subjects list for Specialization track (#1-4)EG: Engineering Subject, SC: Science Subject (offered combinedly by departments) (SVNIT Surat)

Annexure-I

Sardar Vallabhbhai National Institute of Technology (SVNIT) Surat
Department of Mathematics
Bachelor of Technology in Mathematics and Computing (MaC)

Sr. No.	Optional Core	Code	Scheme L-T-P
1	Computer Programming using C/C++	MA131	3-0-2
2	Fundamental of Python Programming	MA134	3-0-2
3	Probability and Statistics	MA136	3-1-0
4	Data Structure and Algorithm	MA233	3-0-2
5	Database Management System	MA235	3-0-2
6	Elementary Number theory	MA232	3-1-0
7	Design and Analysis of Algorithms	MA236	3-0-2
8	Machine Learning	MA334	3-0-2
9	Fundamentals of Artificial Intelligence	CS300	3-1-0

Sr. No.	Elective	Code	Scheme L-T-P
	Elective-I		
1	Analytical Geometry	MA251	3-1-0
2	Object Oriented Programming	MA252	3-0-2
	Elective-II		
3	Computer Networks	CS208	3-0-2
4	Computational Life Science	MA253	3-1-0
	Elective-III & IV		
5	Advanced Mathematical Methods-I	MA351	3-1-0
6	Stochastic Differential equation and computation	MA358	3-0-2
7	Financial Mathematics and computation	MA359	3-0-2
8	Fourier Analysis	MA361	3-1-0
9	Foundation of Cryptography	MA362/CS352	3-0-2/ 3-1-0
10	Mathematical Modelling and computation	MA363	3-1-0
11	Operating Systems	MA364	3-0-2
12	Soft Computing	MA368/ CS365	3-0-2
	Elective-V & VI		
13	Integral and Wavelet Transform	MA365	3-1-0
14	Theory of Computation	MA366	3-1-0
15	Information Theory and Coding	MA367	3-1-0
16	Data Visualization	MA369	3-0-2
17	Advanced Evolutionary Algorithms	MA370	3-0-2
18	Block Chain Technology	CS360	3-1-0
19	High Performance Computing	MA371/ CS357	3-1-0/ 3-0-2

Subject Code:##nXX; ##: Department Identity, n: Year, XX: Subject Sequence number XX: last digit 0 (subject offered in both ODD and EVEN semesters, XX: 01 to 30 – last digit ODD and EVEN for ODD and EVEN semesters (Mandatory Core), XX: 31 to 50 (Optional Core), XX: 51 to 99 (Elective), Subjects list for Minor and Honor (M/H#1-4), Subjects list for Specialization track (#1-4)EG: Engineering Subject, SC: Science Subject (offered combinedly by departments) (SVNIT Surat)

Annexure-I

Sardar Vallabhbhai National Institute of Technology (SVNIT) Surat
Department of Mathematics
Bachelor of Technology in Mathematics and Computing (MaC)

20	Professional Ethics, Economics, and Business Management	MG210	3-1-0
21	Fuzzy Logic and Computation	MA372	3-1-0
	Elective-VII to Elective-X		
22	Big Data Analytics	MA452/CS452	3-0-2
23	Multi Objective Optimization	MA453	3-1-0
24	Evolutionary Algorithms	MA454	3-1-0
25	Computational Fluid Dynamics	MA455	3-0-2
26	Natural Language Processing	MA456/CS459	3-0-2
27	Image Processing and Mining	MA457	3-0-2
28	Computational Finance and Financial Econometrics	MA458	3-1-0
29	Foundations of Robotics	MA459	3-1-0
30	Neural Network	MA460	3-0-2
31	Quantum Computing	MA461	3-0-2
32	Error Correcting Codes	MA462	3-0-2
33	Cloud Computing	MA463	3-0-2
34	Hybrid Algorithms	MA464	3-0-2
35	Financial Instruments and Risk Management	MA465	3-1-0
36	Advanced Operations Research	MA466	3-1-0
37	Theoretical and Computational Neuroscience	MA467	3-1-0
38	Stochastic Finance	MA468	3-1-0

Subject Code:##nXX; ##: Department Identity, n: Year, XX: Subject Sequence number XX: last digit 0 (subject offered in both ODD and EVEN semesters, XX: 01 to 30 – last digit ODD and EVEN for ODD and EVEN semesters (Mandatory Core), XX: 31 to 50 (Optional Core), XX: 51 to 99 (Elective), Subjects list for Minor and Honor (M/H#1-4), Subjects list for Specialization track (#1-4)EG: Engineering Subject, SC: Science Subject (offered combinedly by departments) (SVNIT Surat)