

ACADEMIC CURRICULA
UNDERGRADUATE/ INTEGRATED
POST GRADUATE DEGREE
PROGRAMMES

(With exit option of Diploma)

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 1

(Revised on July 2024)



SRM
INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)

Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

25. B.Tech. in Computer Science and Engineering (Data Science)

25. (a) Mission of the Department

Mission Stmt – 1	To impart knowledge in cutting edge Computer Science and Engineering technologies in par with industrial standards.
Mission Stmt – 2	To collaborate with renowned academic institutions to uplift innovative research and development in Computer Science and Engineering and its allied fields to serve the needs of society
Mission Stmt – 3	To demonstrate strong communication skills and possess the ability to design computing systems individually as well as part of a multidisciplinary teams.
Mission Stmt – 4	To instill societal, safety, cultural, environmental, and ethical responsibilities in all professional activities
Mission Stmt – 5	To produce successful Data Science graduates with personal and professional responsibilities and commitment to lifelong learning

25. (b) Program Educational Objectives (PEO)

PEO – 1	Graduates will be able to demonstrate their knowledge in technical/managerial roles with right skills and aptitude in software industries and R&D sectors
PEO – 2	Graduates will possess the proficiencies and additional skills in core computer science and engineering discipline in par with industry requirements.
PEO – 3	Graduates will be able to successfully pursue higher education in reputed institutions and also extend their research career.
PEO – 4	Graduates will be self-empowered solution providers and entrepreneurs in Computer Science and Engineering
PEO – 5	Graduates will possess the ability to adapt, contribute and innovate new technologies and systems in the key domains of Data Science

25. (c) Mission of the Department to Program Educational Objectives (PEO) Mapping

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. - 3	Mission Stmt. - 4	Mission Stmt. - 5
PEO - 1	3	-	-	-	1
PEO - 2	-	-	2	-	-
PEO - 3	-	3	3	-	-
PEO - 4	-	-	-	2	3
PEO - 5	-	3	3	2	3

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

25. (d) Mapping Program Educational Objectives (PEO) to Program Outcomes (PO)

	Program Outcomes (PO)												Program Specific Outcomes (PSO)		
	1	2	3	4	5	6	7	8	9	10	11	12	PSO-1	PSO-2	PSO-3
	Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning			
PEO - 1	3	-	-	1	-	2	-	3	2	3	-	-	3	3	3
PEO - 2	-	2	2	-	3	-	3	2	-	-	-	-	3	3	3
PEO - 3	-	3	3	2	-	-	-	-	-	2	-	3	3	3	3
PEO - 4	-	2	3	-	-	3	2	-	2	-	2	2	3	3	3
PEO - 5	3	-	-	-	3	3	-	2	-	3	3	3	3	3	3

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

PSO – Program Specific Outcomes (PSO)

PSO - 1	To understand, analyse, design, and develop computing solutions by applying fundamental concepts of computer science and engineering.
PSO - 2	To apply computing principles, skills and practices to develop solutions using logical and reasoning skills for real life problems.
PSO - 3	Ability to understand the requirements, gather a large amount of data, analyze, utilize the tools to extract insights to increase the productivity and efficiency of the business along with better visual representations.

25. (e) Program Structure: B.Tech. in Computer Science and Engineering (Data Science)

Humanities & Social Sciences including Management Courses (H)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21LEH101T	Communicative English	2	1	0	3	
21LEH102T	Chinese	2	1	0	3	
21LEH103T	French					
21LEH104T	German					
21LEH105T	Japanese					
21LEH106T	Korean					
21LEH107T	Spanish					
21LEH108T	Russian					
21GNH101J	Philosophy of Engineering	1	0	2	2	
21PDH209T ¹	Social Engineering	2	0	0	2	
21GNH401T	Behavioral Psychology	2	1	0	3	
Total Credits					13	

Basic Science Courses (B)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21PYB102J	Semiconductor Physics and Computational Methods	3	1	2	5	
21CYB101J	Chemistry	3	1	2	5	
21MAB101T	Calculus and Linear Algebra	3	1	0	4	
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4	
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4	
21MAB301T	Probability and Statistics	3	1	0	4	
21MAB302T	Discrete Mathematics	3	1	0	4	
21BTB102T	Introduction to Computational Biology	2	0	0	2	
Total Credits					32	

Engineering Science Courses (S)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21CSS101J	Programming for Problem Solving	3	0	2	4	
21MES101L ¹	Basic civil and Mechanical Workshop	0	0	4	2	
21MES102L ¹	Engineering Graphics and Design	0	0	4	2	
21EES101T	Electrical and Electronics Engineering	3	1	0	4	
21CSS202T	Fundamentals of Data Science	3	2	0	5	
21DCS201P ¹	Design Thinking and Methodology	1	2	0	3	
21CSS301T	Full Stack Development	1	1	0	2	
Total Credits					22	

Professional Core Courses (C)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21CSC101T	Object Oriented Design and Programming	2	1	0	3	
21CSC201J	Data Structures and Algorithms	3	0	2	4	
21CSC202J	Operating Systems	3	0	2	4	
21CSC206P ¹	Advanced Object Oriented Programming	2	1	0	3	
21CSC204J	Design and Analysis of Algorithms	3	0	2	4	
21CSC205P ¹	Database Management Systems	3	1	0	4	
21CSC206T	Artificial Intelligence	2	1	0	3	
21CSC301T	Formal Language and Automata	3	0	0	3	
21CSC302J	Computer Networks	3	0	2	4	
21CSC303J	Software Engineering and Project Management	2	0	2	3	
21CSC304J	Compiler Design	2	0	2	3	
21CSC307P ¹	Machine Learning for Data Analytics	2	1	0	3	
Total Credits					41	

Non Credit Courses (M)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21PDM101L ¹	Professional Skills and Practices	0	0	2	0	
21PDM102L ¹	General Aptitude	0	0	2		
21PDM201L ¹	Verbal Reasoning	0	0	2		
21PDM202L ¹	Critical and Creative Thinking Skills	0	0	2		
21PDM301L ¹	Analytical and Logical Thinking Skills	0	0	2		
21PDM302L ¹	Employability Skills and Practices	0	0	2		
21CYM101T ¹	Environmental Science	1	0	0	0	
21LEM101T ¹	Constitution of India	1	0	0	0	
21LEM102T ¹	Universal Human Values – Introduction	1	0	0	0	
21LEM201T ¹	Professional Ethics	1	0	0	0	
21LEM202T ¹	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3	
21LEM301T ¹	Indian Art Form	1	0	0	0	
21LEM302T ¹	Indian Traditional Knowledge	1	0	0	0	
21GNM101L ¹	Physical and Mental Health using Yoga	0	0	2	0	
21GNM102L ¹	National Service Scheme					
21GNM103L ¹	National Cadet Corps					
21GNM104L ¹	National Sports Organization					
Total Credits					03	

Open Elective Courses (O) (Any 3 courses)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21CSO351T	Web Programming	2	1	0	3	
21CSO352T	Python Programming	2	1	0	3	
21CSO353T	Mobile Application Development	2	1	0	3	
21CSO354T	Data Analytics	2	1	0	3	
Total Credits					09	

Project Work, Seminar, Internship in Industry / Higher Technical Institutions (P)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21GNP301L ¹	Community Connect	0	0	2	1	
21CSP302L ¹	Project	0	0	6	3	
21CSP303T ¹	MOOC	3	0	0		
21CSP401L	Major Project	0	0	30	15	
21CSP402L	Major Project	0	0	20	10	
21CSP403L	Internship#	0	0	10	5	
Total Credits					19	

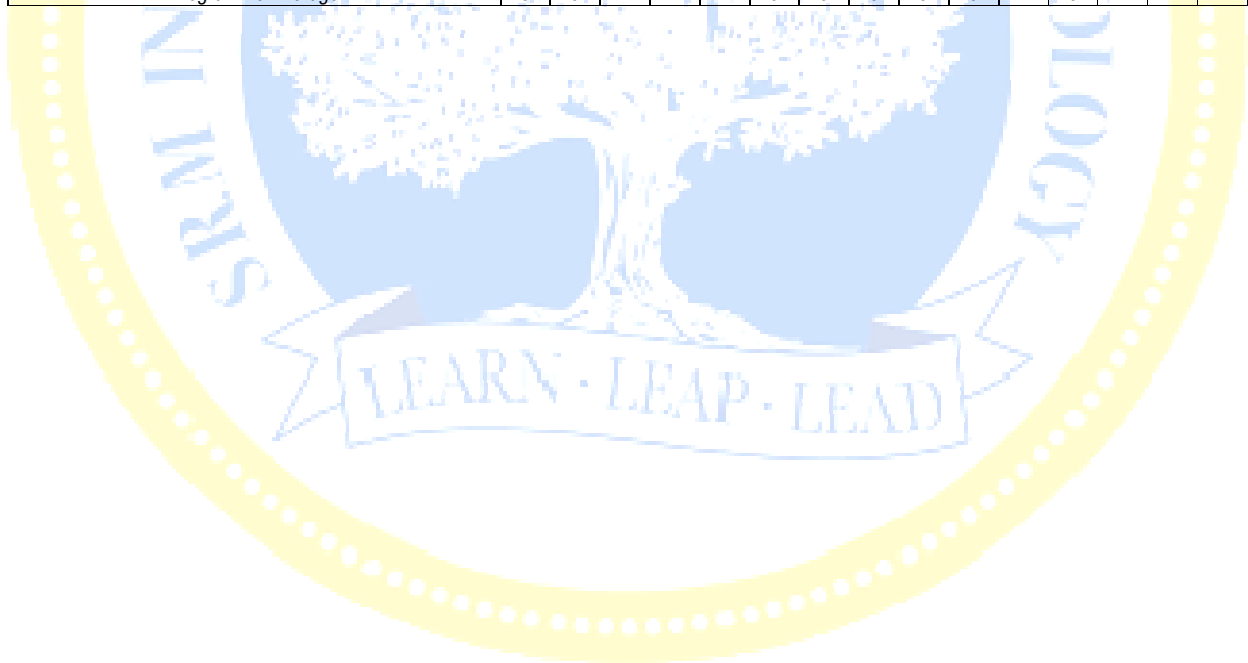
Professional Elective Courses (E) (Any 8 Courses)						Professional Elective Courses (E)					
Course Code	Course Title	Hours / Week			C	Course Code	Course Title	Hours / Week			C
		L	T	P				L	T	P	
21CSE222T	Big Data Tools and Techniques	3	0	0	3	21CSE421T	Business Intelligence and Analytics	2	1	0	3
21CSE224T	Computer Architecture	3	0	0	3	21CSE422T	Convolutional Neural Networks	2	1	0	3
21CSE253T	Internet of Things	2	1	0	3	21CSE423T	Big Data Visualization	2	1	0	3
21CSE251T	Digital Image Processing	3	0	0	3	21CSE424T	Deep Learning for Data Analytics	2	1	0	3
21CSE321T	Data Warehousing and Data Mining	2	1	0	3	21CSE425T	Advanced Machine Learning	2	1	0	3
21CSE322T	Multivariate Techniques for Data Analytics	2	1	0	3	21CSE426T	Financial Machine Learning	2	1	0	3
21CSE323T	Marketing Analytics	2	1	0	3	21CSE427T	Augmented and Virtual Reality	2	1	0	3
21CSE356T	Natural Language Processing	2	1	0	3	21CSE428T	Healthcare Analytics	2	1	0	3
21CSE359T	Information Storage and Management	2	1	0	3	21CSE429T	Data Science for Internet of Things	2	1	0	3
21CSE325T	Applied Social Network Analysis	2	1	0	3	21CSE430T	Automatic Speech Recognition	2	1	0	3
21CSE326T	Artificial Neural Networks	3	0	0	3	21CSE447T	Robot Motion Planning	2	1	0	3
21CSE327T	Cloud Computing for Data Analytics	2	1	0	3	21CSE448T	Bio-inspired Computing and Fuzzy Logic	2	1	0	3
21CSE373T	Streaming Analytics	2	1	0	3	21CSE449T	Risk Analytics	2	1	0	3
						Total Credits 24					



25. (f) Programme Articulation: B.Tech. in Computer Science and Engineering (Data Science)

Course Code	Course Name	Program Outcomes (PO)												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
		Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO-1	PSO-2	PSO-3
21LEH102T	Chinese										3		3			
21LEH103T	French										3		3			
21LEH104T	German										3		3			
21LEH105T	Japanese										3		3			
21LEH106T	Korean										3		3			
21LEH107T	Spanish															
21LEH108T	Russian										3		3			
21GNH101J	Philosophy of Engineering	3	2	3	3	3	2	3	2	3	3		3			
21MAB101T	Calculus and Linear Algebra	3	3													
21CYB101J	Chemistry	3	3	3	2	3										
21BTB102T	Introduction to Computational Biology	3	3	2	1	3										
21CSS101J	Programming for Problem Solving	2	3	-	-	-	-	-	-	-	-	-	2	-	3	-
21MES101L	Basic Civil and Mechanical Workshop	3				1		3					2			
21PDM101L	Professional Skills and Practices									3	3		3			
21GNM101L	Physical and Mental Health using Yoga	3	2	2	3	3	3	3	3	3	3		3			
21GNM102L	NATIONAL SERVICE SCHEME						3	3	3	3						
21GNM103L	NATIONAL CADET CORPS						3		3	3						
21LEH101T	Communicative English									2	3					
21MAB102T	Advanced Calculus and Complex Analysis	3	3													
21PYB102J	Semiconductor Physics and Computational Methods	3	3	3												
21MES102L	Engineering Graphics and Design	2				3					3		2			
21EES101T	Electrical and Electronics Engineering	3	2													
21CSC101T	Object Oriented Design and Programming	-	2	2	-	2	-	-	-	-	-	-	3	-	2	2
21CYM101T	Environmental Science	3	3					3		3						
21PDM102L	General Aptitude		3							3	3		3			
21LEM101T	Constitution of India						3						3			
21CSC201J	Data Structures and Algorithms	2	3	3	1	-	-	-	-	-	-	-	-	1	1	2
21CSS202T	Fundamentals of Data Science		2											1	1	
21CSC202J	Operating Systems	3	3	3	2	-	-	-	-	-	-	-	3	2	-	-
21CSC206P	Advanced Object Oriented Programming		2													
21CSC204J	Design and Analysis of Algorithms	2	1	2	1	-	-	-	-	-	3	-	3	3	1	-
21CSC205P	Database Management Systems	3	2	2	-	-	-	-	-	-	-	-	-	2	1	-
21CSC206T	Artificial Intelligence	1	2	3	-	-	-	-	-	-	-	-	-	1	2	-
21CSC301T	Formal Language and Automata	2	2	2	-	-	-	-	-	-	-	-	-	-	3	-
21CSC302J	Computer Networks	3	-	-	2	3	-	-	-	-	-	-	-	1	-	-
21CSC307P	Machine Learning for Data Analytics													2	2	2
21CSS301T	Full Stack Development													2	1	2
21CSC303J	Software Engineering and Project Management	-	3	2	-	-	-	-	-	2	-	2	-	3	-	-
21CSC304J	Compiler Design	3	3	2	3	2	-	-	-	-	-	-	-	-	1	-
21CSE224T	Computer Architecture	3	2	1												
21CSE222T	Big Data Tools and Techniques					1								1		
21CSE253T	Internet of Things	1	2	1	3	1	2	-	-	-	-	-	-	-	-	2
21CSE251T	Digital Image Processing	3	2	2	3	-	-	-	-	-	-	-	-	2	3	-
21CSE321T	Data Warehousing and Data Mining													2	2	
21CSE322T	Multivariate Techniques for Data Analytics													2	2	2
21CSE323T	Marketing Analytics								3		3			2	2	1
21CSE356T	Natural Language Processing	3	3	2	3	3	-	-	-	-	-	-	-	2	2	-
21CSE359T	Information Storage and Management	-	3	3	-	1	-	-	-	-	-	-	-	1	2	-
21CSE373T	Streaming Analytics	2	2		2	2										
21CSE325T	Applied Social Network Analysis													2	2	2
21CSE326T	Artificial Neural Networks													2	2	2
21CSE327T	Cloud Computing for Data Analytics													1	2	2
21CSE421T	Business Intelligence and Analytics								3		3			2	2	2

Course Code	Course Name	Program Outcomes (PO)												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
		Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO-1	PSO-2	PSO-3
21CSE422T	Convolutional Neural Networks													2	2	2
21CSE423T	Big Data Visualization										3			2	2	2
21CSE424T	Deep Learning for Data Analytics													2	2	2
21CSE425T	Advanced Machine Learning													2	2	2
21CSE426T	Financial Machine Learning													2	2	2
21CSE427T	Augmented and Virtual Reality													2	2	2
21CSE428T	Healthcare Analytics													2	1	2
21CSE429T	Data Science for Internet of Things													2	2	2
21CSE430T	Automatic Speech Recognition													2	2	2
21CSE447T	Robot Motion Planning													2	2	2
21CSE448T	Bio-inspired Computing and Fuzzy Logic													2	1	2
21CSE449T	Risk Analytics													1	2	2
21CSO355T	Machine Learning for All													2	2	
21CSO356T	Convolutional Neural Networks Foundation													2	2	
21CSO357T	Data Visualization Basics													2	2	
21CSO451T	Deep Learning Foundation													2	2	
21CSS303T	Data Science													1	1	
21CSP302L	Project	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21CSP303T	MOOC	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21CSP401L	Major Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21CSP402L	Internship	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Programme Average		3	3	2	2	2	3	3	3	3	3	2	3	2	2	2



25. (g) Implementation Plan: B.Tech. in Computer Science and Engineering (Data Science)

Semester – I					
Course Code	Course Title	Hours / Week			C
		L	T	P	
21LEH102T	Chinese				
21LEH103T	French				
21LEH104T	German				
21LEH105T	Japanese	2	1	0	3
21LEH106T	Korean				
21LEH107T	Spanish				
21LEH108T	Russian				
21GNH101J	Philosophy of Engineering	1	0	2	2
21MAB101T	Calculus and Linear Algebra	3	1	0	4
21CYB101J	Chemistry	3	1	2	5
21BTB102T	Introduction to Computational Biology	2	0	0	2
21CSS101J	Programming for Problem Solving	3	0	2	4
21MES101L ¹	Basic Civil and Mechanical Workshop	0	0	4	2
21PDM101L ¹	Professional Skills and Practices	0	0	2	0
21GNM101L ¹	Physical and Mental Health using Yoga				
21GNM102L ¹	National Service Scheme	0	0	2	0
21GNM103L ¹	National Cadet Corps				
21GNM104L ¹	National Sports Organization				
Total Credits 22					
Semester – II					
Course Code	Course Title	Hours / Week			C
		L	T	P	
21LEH101T	Communicative English	2	1	0	3
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
21PYB102J	Semiconductor Physics and Computational Methods	3	1	2	5
21MES102L ¹	Engineering Graphics and Design	0	0	4	2
21EES101T	Electrical and Electronics Engineering	3	1	0	4
21CSC101T	Object Oriented Design and Programming	2	1	0	3
21CYM101T ¹	Environmental Science*	1	0	0	0
21PDM102L ¹	General Aptitude*	0	0	2	0
21LEM101T ¹	Constitution of India	1	0	0	0
Total Credits 21					
Semester – IV					
Course Code	Course Title	Hours / Week			C
		L	T	P	
21MAB301T	Probability and Statistics	3	1	0	4
21CSC204J	Design and Analysis of Algorithms	3	0	2	4
21CSC205P ¹	Database Management Systems	3	1	0	4
21CSC206T	Artificial Intelligence	2	1	0	3
E	Professional Elective-I				3
21PDH209T ¹	Social Engineering	2	0	0	2
21PDM202L ¹	Critical and Creative Thinking Skills	0	0	2	0
21LEM202T ¹	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3
Total Credits 23					
Semester – VI					
Course Code	Course Title	Hours / Week			C
		L	T	P	
21CSS301T	Full Stack Development	1	1	0	2
21CSC303J	Software Engineering and Project Management	2	0	2	3
21CSC304J	Compiler Design	2	0	2	3
E	Professional Elective – III				3
E	Professional Elective – IV				3
O	Open Elective – II				3
21CSP302L ¹	Project	0	0	6	3
21CSP303T ¹	MOOC	3	0	0	
21PDM302L ¹	Employability Skills and Practices	0	0	2	0
21LEM302T ¹	Indian Traditional Knowledge	1	0	0	0
Total Credits 20					
Semester - VIII					
Course Code	Course Title	Hours / Week			C
		L	T	P	
21CSP401L	Major Project	0	0	30	15
21CSP402L	Major Project	0	0	20	10
21CSP403L	Internship#	0	0	10	5
Total Credits 15					

#Students have to register either 21CSP401L or 21CSP402L and 21CSP403L both in eighth semester

Semester – III					
Course Code	Course Title	Hours / Week			C
		L	T	P	
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4
21DCS201P ¹	Design Thinking and Methodology	1	2	0	3
21CSC201J	Data Structures and Algorithms	3	0	2	4
21CSS202T	Fundamentals of Data Science	3	2	0	5
21CSC202J	Operating Systems	3	0	2	4
21CSC206P ¹	Advanced Object Oriented Programming	2	1	0	3
21LEM201T ¹	Professional Ethics	1	0	0	0
21PDM201L ¹	Verbal Reasoning	0	0	2	0
Total Credits 23					
Semester – V					
Course Code	Course Title	Hours / Week			C
		L	T	P	
21MAB302T	Discrete Mathematics	3	1	0	4
21CSC301T	Formal Language and Automata	3	0	0	3
21CSC302J	Computer Networks	3	0	2	4
21CSC307P ¹	Machine Learning for Data Analytics	2	1	0	3
E	Professional Elective – II				3
O	Open Elective – I				3
21GNP301L ¹	Community Connect	0	0	2	1
21PDM301L ¹	Analytical and Logical Thinking Skills	0	0	2	0
21LEM301T ¹	Indian Art Form	1	0	0	0
Total Credits 21					
Semester – VII					
Course Code	Course Title	Hours / Week			C
		L	T	P	
21GNH401T	Behavioral Psychology	2	1	0	3
E	Professional Elective – V				3
E	Professional Elective – VI				3
E	Professional Elective – VII				3
E	Professional Elective – VIII				3
O	Open Elective –III				3
Total Credits 18					



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