

# **ACADEMIC CURRICULA**

## **UNDERGRADUATE DEGREE PROGRAMMES**

### **Bachelor of Technology In Computer Science and Engineering With Specialization in Cloud Computing**

**(B.Tech. - Four Years)**

**(Choice Based Flexible Credit System)**

**Regulations 2021**

**CURRICULUM**

**SCHOOL OF COMPUTING**



**SRM INSTITUTE OF SCIENCE AND TECHNOLOGY**

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

Kattankulathur, Chengalpattu District 603203, Tamil Nadu, India

## B.Tech. in Computer Science and Engineering with Specialization in Cloud Computing

### (a) Mission of the Department

Mission Stmt - 1	<i>To impart knowledge in cutting edge Computer Science and Engineering technologies in par with industrial standards.</i>
Mission Stmt - 2	<i>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</i>
Mission Stmt - 3	<i>To demonstrate strong communication skills and possess the ability to design computing systems individually as well as part of a multidisciplinary teams.</i>
Mission Stmt - 4	<i>To instill societal, safety, cultural, environmental, and ethical responsibilities in all professional activities</i>
Mission Stmt - 5	<i>To produce successful Computer Science and Engineering graduates with personal and professional responsibilities and commitment to lifelong learning</i>

### (b) Program Educational Objectives (PEO)

PEO - 1	<i>Graduates will be able to perform in technical/managerial roles ranging from design, development, problem solving to production support in software industries and R&amp;D sectors.</i>
PEO - 2	<i>Graduates will be able to successfully pursue higher education in reputed institutions.</i>
PEO - 3	<i>Graduates will have the ability to adapt, contribute and innovate new technologies and systems in the key domains of Computer Science and Engineering.</i>
PEO - 4	<i>Graduates will be ethically and socially responsible solution providers and entrepreneurs in Computer Science and other engineering disciplines.</i>
PEO - 5	<i>Graduates will possess the additional skills in Computer Science and Engineering with Cloud computing discipline knowledge of computing, networking, and intelligent storage system.</i>

### (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 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

### (d) Mapping Program Educational Objectives (PEO) to Program Outcomes (PLO)

	Program Outcomes (PO)											
	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		
PEO - 2		2	2		3		3	2				
PEO - 3		3	3	2						2		3
PEO - 4		2	3			3	2		2		2	2
PEO - 5						3			3	3	3	3

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

### PSO – Program Specific Outcomes (PSO)

PSO - 1	<i>To understand, analyze, design, and develop computing solutions by applying fundamental concepts of computer science and engineering.</i>
PSO - 2	<i>To apply computing principles, skills and practices to develop solutions using logical and reasoning skills, for real life problems.</i>
PSO - 3	<i>Ability to Develop an application and integrate in Cloud Computing Platform</i>

**(e) Program Structure: B.Tech. in Computer Science and Engineering with specialization in Cloud Computing**

1. 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				
21GNH101J	Philosophy of Engineering	1	0	2	2
21PDH201T	Social Engineering	2	0	0	2
21GNH401T	Behavioral Psychology	2	1	0	3
<b>Total Credits</b>					<b>13</b>

  

2. 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
21MAB206T	Numerical Methods and Analysis	3	1	0	4
21MAB204T	Probability and Queueing Theory	3	1	0	4
21MAB302T	Discrete Mathematics	3	1	0	4
21BTB102T	Introduction to Computational Biology	2	0	0	2
<b>Total Credits</b>					<b>32</b>

  

3. Engineering Science Courses (S)					
Course Code	Course Title	Hours/Week			C
		L	T	P	
21EES101T	Electrical and Electronics Engineering	3	1	0	4
21MES101L	Basic Civil and Mechanical Workshop	0	0	4	2
21MES102L	Engineering Graphics and Design	0	0	4	2
21CSS101J	Programming for Problem Solving	3	0	2	4
21CSS201T	Computer Organization and Architecture	3	1	0	4
21DCS201P	Design Thinking and Methodology	1	2	0	3
21CSS303T	Data Science	2	0	0	2
<b>Total Credits</b>					<b>21</b>

  

4. 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
21CSC203P	Advanced Programming Practice	3	1	0	4
21CSC204J	Design and Analysis of Algorithms	3	0	2	4
21CSC205P	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
21CSC316J	Cloud Architecture and Protocols	2	0	2	3
21CSC314P	Big Data Essentials	2	1	0	3
<b>Total Credits</b>					<b>42</b>

  

5. Professional Elective Courses (E) (Any 8 Elective Courses)					
Course Code	Course Title	Hours/Week			C
		L	T	P	
21CSE261T	Fundamentals of Cloud Computing	2	1	0	3
21CSE262T	Communication Systems Engineering	2	1	0	3
21CSE253T	Internet of Things	2	1	0	3
21CSE263T	Digital Communication Systems	2	1	0	3
21CSE329T	Service Oriented Architecture and Microservices	2	1	0	3
21CSE330T	Cloud Architecture	2	1	0	3
21CSE363T	AWS Solution Architect	2	1	0	3
21CSE364T	Data Centric Networking and System Design	2	1	0	3
21CSE354T	Full Stack Web Development	2	1	0	3
21CSE355T	Data Mining and Analytics	2	1	0	3
21CSE356T	Natural Language Processing	2	1	0	3
21CSE357T	Distributed Computing	2	1	0	3
21CSE358T	Network Security and Cryptography	2	1	0	3
21CSE359T	Information Storage and Management	2	1	0	3
21CSE360T	High Performance Computing	2	1	0	3
21CSE461T	Cloud Security	2	1	0	3
21CSE463T	Cloud Strategy Planning and Management	2	1	0	3
21CSE464T	Fog Computing Analytics	2	1	0	3
21CSE465T	Cloud Application Development	2	1	0	3
21CSE466T	Network Design and Management	2	1	0	3
21CSE455T	Social Network Analysis	2	1	0	3
21CSE456T	Software Defined Networks	2	1	0	3
21CSE454T	Computer Vision	2	1	0	3
21CSE458T	Wireless and Mobile Communication	2	1	0	3
21CSE459T	Wireless Sensor Networks	2	1	0	3
21CSE460T	Network Protocols and Algorithms	2	1	0	3
<b>Total Credits</b>					<b>24</b>

  

6. 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
<b>Total Credits</b>					<b>9</b>

  

7. Project Work, Seminar, Internship In Industry / Higher Technical Institutions (P)					
Course Code	Course Title	Hours/Week			C
		L	T	P	
21GNP301L	Community Connect	0	0	2	1
21CSP302L	Project	0	0	6	3
21CSP303T	MOOC	3	0	0	
21CSP401L	Major Project	0	0	30	15
(Or)					
21CSP403L	Major Project	0	0	20	10
21CSP404L	Internship	0	0	10	5
<b>Total Credits</b>					<b>19</b>

  

8. Mandatory Courses (M)					
Code	Course Title	Hours/Week			C
		L	T	P	
21PDM101L	Professional Skills and Practices	0	0	2	0
21PDM102L	General Aptitude	0	0	2	0
21PDM201L	Verbal Reasoning	0	0	2	0
21PDM202L	Critical and Creative Thinking Skills	0	0	2	0
21PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
21PDM302L	Employability Skills and Practices	0	0	2	0
21CYM101T	Environmental Science	1	0	0	0
21LEM101T	Constitution of India	1	0	0	0
21LEM201T	Professional Ethics	1	0	0	0
21LEM202T	Universal Human Values	1	0	0	0
21LEM301T	Indian Art Form	1	0	0	0
21LEM302T	Indian Traditional Knowledge	1	0	0	0
21GNM101L	Physical and Mental Health using Yoga	0	0	2	0
21GNM102L	NSS				
21GNM103L	NCC				
21GNM104L	NSO				
<b>Total Credits</b>					<b>0</b>

**(f) Program Articulation: B.Tech. in Computer Science and Engineering with Specialization in Cloud Computing**

Course Code	Course Name	Program Outcomes (PO)													Program Specific Outcomes (PSO)		
		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	
21CSS101J	Programming for Problem Solving	2	3														
21CSS201T	Computer Organization and Architecture	3	2											2			
21CSC201J	Data Structures and Algorithms	3	3	3											3		
21CSC101T	Object Oriented Design and Programming	3	3											3			
21CSC204J	Design and Analysis of Algorithms	2	1	2												3	
21CSC202J	Operating Systems	3	3	3	2								3	3			
21CSC303J	Software Engineering and Project Management		2							3		3		3			2
21CSC203P	Advanced Programming Practice	3	2	2	1	2				1						2	
21CSC301T	Formal Language and Automata	3	3	2	3											3	
21CSC302J	Computer Networks	2		3		3								2			
21CSC205P	Database Management Systems		3	3		3								2	3		
21CSC206T	Artificial Intelligence		2	3	3											3	2
21CSC316J	Cloud Architecture and Protocols	3	2			3								2	3		
21CSC314P	Big Data Essentials	2			3	3											
21CSE261T	Fundamentals of Cloud Computing	3			2	2								3			
21CSE262T	Communication Systems Engineering	3			3									3			
21CSE253T	Internet of Things	3				2											
21CSE263T	Digital Communication Systems	2	3											3			
21CSE329T	Service Oriented Architecture and Microservices	3		2										3			
21CSE330T	Cloud Architecture	3			2									3			
21CSE363T	AWS Solution Architect	2	3		3									3		3	
21CSE364T	Data Centric Networking and System Design		2		3									3			
21CSE354T	Full Stack Web Development		2	2		2								3		2	
21CSE355T	Data Mining and Analytics	1	2			3										3	
21CSE356T	Natural Language Processing	3	3	2	3	3								2			
21CSE357T	Distributed Computing	2		3		3								2			2
21CSE358T	Cryptography and Network Security	2	3	3		2										3	2
21CSE359T	Information Storage and Management	3	2	2		1						3		2		1	
21CSE360T	High Performance Computing	3	3	3	3	3								3		2	
21CSE461T	Cloud Security	3	2	3										3		2	
21CSE463T	Cloud Strategy Planning and Management	3	3		3									3			
21CSE464T	Fog Computing Analytics	3				3								3			
21CSE465T	Cloud Application Development	2		3		2									3		
21CSE466T	Network Design and Management	2	3		3									2			
21CSE455T	Social Network Analysis	2	3	3	3	3									2	2	
21CSE456T	Software Defined Networks	2		3		3									3	2	
21CSE454T	Computer Vision	3	2	1	1	1									2		
21CSE458T	Wireless and Mobile Communication			3		3					2				2		
21CSE459T	Wireless Sensor Networks			3		3					2				3		
21CSE460T	Network Protocols and Algorithms			3		3					2			3			
21GNP301L	Community Connect									3			3				
21CSP302L	Project	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	
21CSP303T	MOOC	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	
21CSP403L	Major Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
21CSP404L	Internship	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
	Program Average																

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

**(g) Implementation Plan: B.Tech. in Computer Science and Engineering w/s Cloud Computing**

Semester - I					
Code	Course Title	Hours/Week			C
		L	T	P	
21LEH102T	Chinese				
21LEH103T	French				
21LEH104T	German	2	1	0	3
21LEH105T	Japanese				
21LEH106T	Korean				
21LEH107T	Spanish	2	1	0	3
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
21CSS201J	Programming for Problem Solving	3	0	2	4
21MES101L	Basic Civil and Mechanical Workshop	0	0	4	2
21PDM101L	Professional Skills and Practices	0	0	2	0
21GNM101L	Physical and Mental Health using Yoga				
21GNM102L	NSS	0	0	2	0
21GNM103L	NCC				
21GNM104L	NSO				
Total Credits					22

Semester - II					
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	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	Environmental Science*	1	0	0	0
21PDM102L	General Aptitude*	0	0	2	0
21LEM101T	Constitution of India	1	0	0	0
Total Credits					21

Semester - III					
Code	Course Title	Hours/Week			C
		L	T	P	
21MAB206T	Numerical Methods and Analysis	3	1	0	4
21DCS201P	Design Thinking and Methodology	1	2	0	3
21CSS201T	Computer Organization and Architecture	3	1	0	4
21CSC201J	Data Structures and Algorithms	3	0	2	4
21CSC202J	Operating Systems	3	0	2	4
21CSC203P	Advanced Programming Practice	3	1	0	4
21LEM201T	Professional Ethics	1	0	0	0
21PDM201L	Verbal Reasoning	0	0	2	0
Total Credits					23

Semester - IV					
Code	Course Title	Hours/Week			C
		L	T	P	
21MAB204T	Probability and Queueing Theory	3	1	0	4
21CSC204J	Design and Analysis of Algorithms	3	0	2	4
21CSC205P	Database Management Systems	3	1	0	4
21CSC206T	Artificial Intelligence	2	1	0	3
E	Professional Elective-I				3
21PDH201T	Social Engineering	2	0	0	2
21PDM202L	Critical and Creative Thinking Skills	0	0	2	0
21LEM202T	Universal Human Values	1	0	0	0
Total Credits					20

Semester - V					
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
21CSC314P	Big Data Essentials	2	1	0	3
E	Professional Elective - II				3
O	Open Elective - I				3
21GNP301L	Community Connect	0	0	2	1
21PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
21LEM301T	Indian Art Form	1	0	0	0
Total Credits					21

Semester - VI					
Code	Course Title	Hours/Week			C
		L	T	P	
21CSS303T	Data Science	2	0	0	2
21CSC303J	Software Engineering and Project Management	2	0	2	3
21CSC316J	Cloud Architecture and Protocols	2	0	2	3
E	Professional Elective - III	3	0	0	3
E	Professional Elective - IV	3	0	0	3
O	Open Elective - II	3	0	0	3
21CSP302L	Project	0	0	6	3
21CSP303T	MOOC	3	0	0	3
21PDM302L	Employability Skills and Practices	0	0	2	0
21LEM302T	Indian Traditional Knowledge	1	0	0	0
Total Credits					20

Semester - VII					
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

Semester - VIII					
Code	Course Title	Hours/Week			C
		L	T	P	
21CSP401L	Major Project	0	0	30	15
(Or)					
21CSP403L	Major Project	0	0	20	10
21CSP404L	Internship	0	0	10	5
Total Credits					15