



Symbiosis Institute of Computer Studies and Research, Pune
Master of Science (Computer Applications)
Programme Structure 2021-23

1. OBJECTIVE	<p>This programme will equip students with knowledge highly relevant to emerging technologies. This programme aims to provide a comprehensive framework for understanding by integrating theoretical foundations with extensive practical work in the labs and hands-on experience.</p> <p>The programme offers following areas of specializations:</p> <ul style="list-style-type: none"> i. Software Development ii. Systems Administration iii. Data Science iv. System Security 				
2. DURATION (IN MONTHS)	24 (Full Time)				
3. INTAKE	30				
4. RESERVATION	I. Within the sanctioned intake	a) SC (In Percentage)	b) ST (In Percentage)	c) Differently abled (In Percentage)	d) Defence (In Percentage)
		15	7.5	3	0
	II. Over and above the sanctioned intake	a) Kashmiri Migrants (In Seats)		b) International Students (In Percentage)	
		2		15	
5. ELIGIBILITY	Graduate from any recognised University/ Institution of National Importance with a minimum of 50% marks or equivalent grade (45% marks or equivalent grade for Scheduled Caste / Scheduled Tribes).				
6. SELECTION PROCEDURE	Symbiosis National Aptitude Test, Group Exercise, Personal Interaction and Writing Ability Test (GE-PIWAT)				
7. MEDIUM OF INSTRUCTION	English				
8. PROGRAMME PATTERN	Semester				
9. COURSE & SPECIALIZATION	Attached as Annexure A				
10. FEE		Academic Fee p.a	Institute Deposit	Total	
	Indian Students	390000	20000	410000	
	International Students (USD equivalent to INR)	585000	20000	605000	
11. ASSESSMENT	All internal courses will have 100% component as internal evaluation at the institute level. All external courses will have 60% internal component and 40% component as external [University] examination.				

12.	STANDARD OF PASSING	The assessment of the student for each examination is done, based on relative performance. Maximum Grade Point (GP) is 10 corresponding to O (Outstanding). For all courses, a student is required to pass both internal and external examination separately with a minimum Grade Point of 4 corresponding to Grade P. Students securing less than 40% absolute marks in each head of passing will be declared FAIL. The University awards a degree to the student who has achieved a minimum CGPA of 4 out of maximum of 10 CGPA for the programme.					
13.	AWARD OF DEGREE/ DIPLOMA/ CERTIFICATE	Master of Science (Computer Applications) will be awarded at the end of 4th semester examination by taking into consideration the performance of all 4 semesters examinations after obtaining minimum 4.00 CGPA out of 10.00 CGPA.					
14.	NATURE WISE DISTRIBUTION OF CREDITS						
Semester	Generic Core	Generic Elective	Specialization Core	Specialization Elective	Open Elective	Audit	Total
1	26	0	0	0	0	1*	26
2	8	0	8	6	0	1*	22
3	0	0	10	6	0	1*	16
4	16	0	0	0	0	0	16
Total	50	0	18	12	0	0	80
* Satisfactory completion of the non letter grade courses 'Integrated Disaster Management', 'Research Publication' 'Certificate in COVID-19 Care for the Community' is mandatory for award of degree.							
The revised programme structure supersedes the previously approved programme structure dated 11/05/2021 for the programme.							

This Programme Structure is aligned with the norms laid down by the University and is approved by the Academic Council. Hereafter changes (if any) which conform to the policy on "Curriculum Development and Review" would be permissible, subject to revision of the Programme Structure, following the specified processes.

Head - Academics

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Annexure A

Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Marks	External Marks	Total Marks
Semester : 1							
Generic Core Courses							
T3590	0301420101	Design of Content Management System		4	120	80	200
T3545	0301420102	Fundamentals of Computer Networking		3	90	60	150
T3537	0301420103	Scripting Language		3	90	60	150
T3574	0301420104	Design and Analysis of Algorithms		3	90	60	150
T3580	0301420105	Relational Database Management System		3	90	60	150
T3009	0301420106	Best Programming Practices		2	60	40	100
T3213	0301420107	Introduction to Operating System		2	60	40	100
T3198	0301420108	Introduction to Python		2	60	40	100
T7674	0301420109	Cyber Security		2	60	40	100
T2843	0301420110	Research Methodology		2	60	40	100
TH4272	0301420111	Certificate in COVID-19 Care for the Community *		0	0	0	Non Letter Grade
Total				26	780	520	1300
Semester : 2							
Generic Core Courses							
T3527	0301420201	Big Data: Systems, Programming and Management		4	200	0	200
T3344	0301420202	DevOps		2	60	40	100
T3701	0301420203	Dissertation		2	100	0	100
T4005	0301420204	Integrated Disaster Management *		0	0	0	Non Letter Grade
Total				8	360	40	400
Specialization Core Courses : Software Development							
T3114	0301420205	Object Oriented Analysis Design	Software Development	4	120	80	200
T3120	0301420206	Software Project Management	Software Development	4	120	80	200
Total				8	240	160	400
Specialization Elective : Software Development							
T3356	0301420207	NOSQL Databases	Software Development	3	90	60	150
T3281	0301420208	Data Warehousing	Software Development	3	90	60	150



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Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Marks	External Marks	Total Marks
T3018	0301420209	R Programming	Software Development	3	90	60	150
T3003	0301420210	Android Technologies	Software Development	3	90	60	150
T3025	0301420211	Linux Scripting	Software Development	3	90	60	150
T3124	0301420212	Software Verification and Validation	Software Development	3	90	60	150
T3672	0301420213	Blockchain and It's Applications	Software Development	3	150	0	150
Total Required Credits				6	180	120	300
Specialization Core Courses : System Administration							
T3052	0301420214	Network Operating Systems	System Administration	3	90	60	150
T3424	0301420215	Server Hardening	System Administration	3	90	60	150
T3420	0301420216	Esseentials of Vulnerability Assessment and Penetration Testing	System Administration	2	60	40	100
Total				8	240	160	400
Specialization Elective : System Administration							
T3356	0301420207	NOSQL Databases	System Administration	3	90	60	150
T3124	0301420212	Software Verification and Validation	System Administration	3	90	60	150
T3672	0301420213	Blockchain and It's Applications	System Administration	3	150	0	150
T3279	0301420217	Database Administration - I	System Administration	3	90	60	150
T3022	0301420218	Cryptography	System Administration	3	90	60	150
Total Required Credits				6	180	120	300
Specialization Core Courses : System Security							
T3022	0301420218	Cryptography	System Security	3	90	60	150
T3034	0301420219	Database and Application Security	System Security	3	90	60	150



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Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Marks	External Marks	Total Marks
T3617	0301420220	Security Standards	System Security	2	60	40	100
Total				8	240	160	400
Specialization Elective : System Security							
T3124	0301420212	Software Verification and Validation	System Security	3	90	60	150
T3672	0301420213	Blockchain and It's Applications	System Security	3	150	0	150
T3619	0301420221	Web Application Security	System Security	2	60	40	100
T3618	0301420222	IT Audit and Risk Management	System Security	2	60	40	100
T3645	0301420223	secure software engineering	System Security	2	60	40	100
T3625	0301420224	Network Security Testing	System Security	2	60	40	100
Total Required Credits				6	150	100	250
Specialization Core Courses : Data Science							
T3120	0301420206	Software Project Management	Data Science	4	120	80	200
T3576	0301420225	Computation Methods	Data Science	2	60	40	100
T3577	0301420226	Data Analysis Using Python	Data Science	2	60	40	100
Total				8	240	160	400
Specialization Elective : Data Science							
T3356	0301420207	NOSQL Databases	Data Science	3	90	60	150
T3281	0301420208	Data Warehousing	Data Science	3	90	60	150
T3018	0301420209	R Programming	Data Science	3	90	60	150
T3025	0301420211	Linux Scripting	Data Science	3	90	60	150
T3672	0301420213	Blockchain and It's Applications	Data Science	3	150	0	150
T3567	0301420227	Data Analysis and Visualization	Data Science	3	90	60	150
T3268	0301420228	Fuzzy Logic	Data Science	3	90	60	150
Total Required Credits				6	180	120	300
Semester : 3							
Generic Core Courses							
T0100	0301420301	Research Publication *		0	0	0	Non Letter Grade



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Total				0	0	0	0
Specialization Core Courses : Software Development							
T3293	0301420302	Software Architectures	Software Development	4	120	80	200
T3536	0301420303	Web UI and Content Management	Software Development	4	120	80	200
T3802	0301420304	Pilot Project	Software Development	2	100	0	100
Total				10	340	160	500
Specialization Elective : Software Development							
T3111	0301420305	Data Mining and Algorithms	Software Development	3	90	60	150
T3122	0301420306	Software Quality Models	Software Development	3	90	60	150
F0003	0301420307	Flexi-Credit Course	Software Development	3	150	0	150
T3015	0301420308	Network Programming	Software Development	3	90	60	150
T3008	0301420309	Cloud Programming using Web Services	Software Development	3	90	60	150
T3271	0301420310	Systems Programming	Software Development	3	90	60	150
Total Required Credits				6	180	120	300
Specialization Core Courses : System Administration							
T3802	0301420304	Pilot Project	System Administration	2	100	0	100
T3053	0301420311	Server Security and Hardening	System Administration	4	120	80	200
T3418	0301420312	Advanced Vulnerability Assessment and Penetration Testing	System Administration	2	60	40	100
T3416	0301420313	Computer Forensic - Detection & Prevention of Frauds	System Administration	2	60	40	100
Total				10	340	160	500
Specialization Elective : System Administration							
T3015	0301420308	Network Programming	System Administration	3	90	60	150
T3278	0301420314	Applied Cryptography	System Administration	3	90	60	150



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T3419	0301420315	Cloud Development and Administration	System Administration	3	90	60	150
T3050	0301420316	IS Risk Analysis and System Audit	System Administration	3	90	60	150
T3280	0301420317	Database Administration - II	System Administration	3	90	60	150
T3063	0301420318	Data Centre Infrastructure Management	System Administration	3	90	60	150
T3056	0301420319	Wireless Networks	System Administration	3	90	60	150
T3065	0301420320	Network Operations, Design, Optimization and Management	System Administration	3	90	60	150
F0003	0301420321	Flexi-Credit Course	System Administration	3	150	0	150
Total Required Credits				6	180	120	300
Specialization Core Courses : System Security							
T3802	0301420304	Pilot Project	System Security	2	100	0	100
T3054	0301420322	Vulnerability Assessment and Penetration Testing	System Security	4	120	80	200
T3044	0301420323	Security Management Practices	System Security	2	60	40	100
T3542	0301420324	Information System Audit	System Security	2	60	40	100
Total				10	340	160	500
Specialization Elective : System Security							
T3032	0301420325	Computer Forensics - Detection and Prevention of IT Frauds	System Security	3	90	60	150
T3543	0301420326	Virtualization and Security	System Security	3	90	60	150
T3540	0301420327	Identity and Access Management	System Security	3	90	60	150
F0003	0301420328	Flexi-Credit Course	System Security	3	150	0	150
Total Required Credits				6	180	120	300
Specialization Core Courses : Data Science							
T3802	0301420304	Pilot Project	Data Science	2	100	0	100
T3578	0301420329	Image Processing	Data Science	4	120	80	200
T3579	0301420330	Machine Learning Algorithms	Data Science	4	120	80	200
Total				10	340	160	500
Specialization Elective : Data Science							
T3008	0301420309	Cloud Programming using Web Services	Data Science	3	90	60	150



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T3448	0301420331	Text Analytics	Data Science	3	90	60	150
T3569	0301420332	Data Science for IOT	Data Science	3	90	60	150
T3566	0301420333	Artificial Neural Network and Deep Learning	Data Science	3	90	60	150
T3568	0301420334	Natural Language Processing	Data Science	3	90	60	150
F0003	0301420335	Flexi-Credit Course	Data Science	3	150	0	150
Total Required Credits				6	180	120	300
Semester : 4							
Generic Core Courses							
T3916	0301420401	Industry Internship		16	480	320	800
Total				16	480	320	800



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Semester	Internal Credits	External Credits	Total Credits	Total Marks
Software Development				
Semester 1	0	26	26	1300
Semester 2	9	13	22	1100
Semester 3	5	11	16	800
Semester 4	0	16	16	800
Total	14	66	80	4000
System Administration				
Semester 1	0	26	26	1300
Semester 2	9	13	22	1100
Semester 3	5	11	16	800
Semester 4	0	16	16	800
Total	14	66	80	4000
System Security				
Semester 1	0	26	26	1300
Semester 2	9	13	22	1100
Semester 3	5	11	16	800
Semester 4	0	16	16	800
Total	14	66	80	4000
Data Science				
Semester 1	0	26	26	1300
Semester 2	9	13	22	1100
Semester 3	5	11	16	800
Semester 4	0	16	16	800
Total	14	66	80	4000