Symbiosis Institute of Computer Studies and Research, Pune
Master of Science (Computer Applications)
Programme Structure 2023-25

1.	OBJECTIVE	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. The programme offers following areas of specializations: i. Software Development ii. Data Science iii. 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	As per Annexure A				
10.	FEE		Academic Fee p.a		Institute Deposit	Total
	Indian Students (Amount in INR)		410000		20000	430000
	International Students	NRI/ PIO/ OCI Category (Amount in US$)	8000		275	8275
		Foreign National Category (Amount in US$)	1950		275	2225

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**	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. CLASSIFICATION OF CREDITS

Semester	Generic Core	Generic Elective	Specializa-tion Core	Specializa-tion Elective	Open Elective	Non-Letter Grade Mandatory Course/s	Non-Letter Grade Audit Course/s	Total
Common								
1	23	0	0	0	0	0	As per the student's choice	23
2	11	0	8	6	0	1		25
3	4	0	10	6	0	0		20
4	12	0	0	0	0	0		12
Total	**50**	**0**	**18**	**12**	**0**	**0**		**80**

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.

Director - Academics

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Symbiosis Institute of Computer Studies and Research, Pune
Master of Science (Computer Applications)
Programme Structure 2023-25

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
T3574	0301420102	Design and Analysis of Algorithms		3	90	60	150
T3545	0301420103	Fundamentals of Computer Networking		3	90	60	150
T3580	0301420104	Relational Database Management System		3	90	60	150
T3009	0301420105	Best Programming Practices		2	60	40	100
T7674	0301420106	Cyber Security		2	60	40	100
T3213	0301420107	Introduction to Operating System		2	60	40	100
T3198	0301420108	Introduction to Python		2	60	40	100
T2843	0301420109	Research Methodology		2	60	40	100
			Total	**23**	**690**	**460**	**1150**
Semester : 2							
Generic Core Courses							
T3527	0301420201	Big Data: Systems, Programming and Management		4	200	0	200
F0003	0301420202	Flexi-Credit Course		3	150	0	150
T3344	0301420203	DevOps		2	60	40	100
T4005	0301420205	Integrated Disaster Management		0	0	0	Non - Letter Grade Mandatory
T3702	0301420204	Dissertation		2	100	0	100
			Total	**11**	**510**	**40**	**550**
Specialization Core Courses : Software Development							
T3114	0301420206	Object Oriented Analysis Design	Software Development	4	120	80	200
T3120	0301420207	Software Project Management	Software Development	4	120	80	200
			Total	**8**	**240**	**160**	**400**
Specialization Elective : Software Development (Choose any Two course)							
T3003	0301420208	Android Technologies	Software Development	3	90	60	150
TE7549	0301420209	Cloud Computing and Distributed Systems	Software Development	3	90	60	150
T3281	0301420210	Data Warehousing	Software Development	3	90	60	150
T2064	0301420211	Entrepreneurship and Global Capitalism	Software Development	3	90	60	150
T3406	0301420212	Foundation Web Technology	Software Development	3	90	60	150
T3356	0301420213	NOSQL Databases	Software Development	3	90	60	150
T3018	0301420214	R Programming	Software Development	3	90	60	150
T3124	0301420215	Software Verification and Validation	Software Development	3	90	60	150
			Total Required Credits	**6**	**180**	**120**	**300**
Specialization Core Courses : System Security							
T3022	0301420216	Cryptography	System Security	3	90	60	150
T3034	0301420217	Database and Application Security	System Security	3	90	60	150
T3617	0301420218	Security Standards	System Security	2	60	40	100
			Total	**8**	**240**	**160**	**400**
Specialization Elective : System Security							
TE7549	0301420209	Cloud Computing and Distributed Systems	System Security	3	90	60	150
T2064	0301420211	Entrepreneurship and Global Capitalism	System Security	3	90	60	150
T3618	0301420219	IT Audit and Risk Management	System Security	2	60	40	100
T3625	0301420220	Network Security Testing	System Security	2	60	40	100
T3645	0301420221	Secure Software Engineering	System Security	2	60	40	100
T3619	0301420222	Web Application Security	System Security	2	60	40	100
			Total Required Credits	**6**	**180**	**120**	**300**
Specialization Core Courses : Data Science							

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Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Marks	External Marks	Total Marks
T3120	0301420207	Software Project Management	Data Science	4	120	80	200
T3576	0301420223	Computation Methods	Data Science	2	60	40	100
T3577	0301420224	Data Analysis Using Python	Data Science	2	60	40	100
			Total	**8**	**240**	**160**	**400**
Specialization Elective : Data Science (Choose any Two course)							
TE7549	0301420209	Cloud Computing and Distributed Systems	Data Science	3	90	60	150
T3281	0301420210	Data Warehousing	Data Science	3	90	60	150
T2064	0301420211	Entrepreneurship and Global Capitalism	Data Science	3	90	60	150
T3356	0301420213	NOSQL Databases	Data Science	3	90	60	150
T3018	0301420214	R Programming	Data Science	3	90	60	150
T3567	0301420225	Data Analysis and Visualization	Data Science	3	90	60	150
T3268	0301420226	Fuzzy Logic	Data Science	3	90	60	150
			Total Required Credits	**6**	**180**	**120**	**300**
Semester : 3							
Generic Core Courses							
F0002	0301420301	Flexi-Credit Course		2	100	0	100
T3492	0301420302	Internet of Things		2	60	40	100
			Total	**4**	**160**	**40**	**200**
Specialization Core Courses : Software Development							
T3293	0301420303	Software Architectures	Software Development	4	120	80	200
T3536	0301420304	Web UI and Content Management	Software Development	4	120	80	200
T3802	0301420305	Pilot Project	Software Development	2	100	0	100
			Total	**10**	**340**	**160**	**500**
Specialization Elective : Software Development (Choose any Two course)							
T3697	0301420306	Advanced Programming in Python	Software Development	3	90	60	150
T3008	0301420307	Cloud Programming using Web Services	Software Development	3	90	60	150
T3111	0301420308	Data Mining and Algorithms	Software Development	3	90	60	150
F0003	0301420309	Flexi-Credit Course	Software Development	3	150	0	150
T3122	0301420310	Software Quality Models	Software Development	3	90	60	150
T3271	0301420311	Systems Programming	Software Development	3	90	60	150
			Total Required Credits	**6**	**180**	**120**	**300**
Specialization Core Courses : System Security							
T3802	0301420312	Pilot Project	System Security	2	100	0	100
T3054	0301420313	Vulnerability Assessment and Penetration Testing	System Security	4	120	80	200
T3542	0301420314	Information System Audit	System Security	2	60	40	100
T3044	0301420315	Security Management Practices	System Security	2	60	40	100
			Total	**10**	**340**	**160**	**500**
Specialization Elective: System Security (Choose any Two course)							
F0003	0301420316	Flexi-Credit Course	System Security	3	150	0	150
T3032	0301420317	Computer Forensics - Detection and Prevention of IT Frauds	System Security	3	90	60	150
TE7618	0301420318	Cyber Physical System	System Security	3	90	60	150
T3540	0301420319	Identity and Access Management	System Security	3	90	60	150
T3543	0301420320	Virtualization and Security	System Security	3	90	60	150
			Total Required Credits	**6**	**240**	**60**	**300**
Specialization Core Courses : Data Science							
T3802	0301420321	Pilot Project	Data Science	2	100	0	100
T3578	0301420322	Image Processing	Data Science	4	120	80	200
T3579	0301420323	Machine Learning Algorithms	Data Science	4	120	80	200
			Total	**10**	**340**	**160**	**500**
Specialization Elective : Data Science (Choose any Two course)							
T3008	0301420307	Cloud Programming using Web Services	Data Science	3	90	60	150

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Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Marks	External Marks	Total Marks
F0003	0301420324	Flexi-Credit Course	Data Science	3	150	0	150
T3566	0301420325	Artificial Neural Network and Deep Learning	Data Science	3	90	60	150
T3462	0301420326	Cyber Security Analytics	Data Science	3	90	60	150
T3569	0301420327	Data Science for IOT	Data Science	3	90	60	150
T3568	0301420328	Natural Language Processing	Data Science	3	90	60	150
T3448	0301420329	Text Analytics	Data Science	3	90	60	150
			Total Required Credits	**6**	**240**	**60**	**300**
Semester : 4							
Generic Core Courses							
T3912	0301420401	Industry Internship		12	360	240	600
			Total	**12**	**360**	**240**	**600**

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Semester	Internal Credits	External Credits	Total Credits	Total Marks
Software Development				
Semester 1	0	23	23	1150
Semester 2	9	16	25	1250
Semester 3	4	16	20	1000
Semester 4	0	12	12	600
Total	**13**	**67**	**80**	**4000**
System Security				
Semester 1	0	23	23	1150
Semester 2	9	16	25	1250
Semester 3	7	13	20	1000
Semester 4	0	12	12	600
Total	**16**	**64**	**80**	**4000**
Data Science				
Semester 1	0	23	23	1150
Semester 2	9	16	25	1250
Semester 3	7	13	20	1000
Semester 4	0	12	12	600
Total	**16**	**64**	**80**	**4000**