



Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications/ Bachelor of Computer
Applications (Honours)
Programme Structure 2022-25

1.	OBJECTIVE	BCA offers the prequalification for professionals heading for smart career in the IT field, which measures up to international standards. On completing this course one can do higher studies in any UGC recognized universities or in any other reputed institution in India or abroad. BCA (Honours) with specialization will prepare students to progress their career in the software industry, academia, research, entrepreneurial pursuit and other Information technology enabled services in one of the area in Data Science, Artificial Intelligence and Machine Learning, Cloud Computing, and Data security.				
2.	DURATION (IN MONTHS)	36 (Full Time)				
3.	INTAKE	180				
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	5
		II.Over and above the sanctioned intake	a) Kashmiri Migrants (In Seats)		b) International Students (In Percentage)	
			2		15	
5.	ELIGIBILITY	Passed Standard XII (10+2) or equivalent government approved Diploma in Engineering/ Technology from any recognised Board with a minimum of 50% marks or equivalent grade (45% marks or equivalent grade for Scheduled Caste/ Scheduled Tribes).				
6.	SELECTION PROCEDURE	Symbiosis Entrance Test, Personal Interaction and Writing Ability Test (PI-WAT)				
7.	MEDIUM OF INSTRUCTION	English				
8.	PROGRAMME PATTERN	Semester				
9.	COURSE & SPECIALIZATION	Annexure A: Bachelor of Computer Applications Students may pursue optional 'Honours' in one of the specialization areas by completing additional 24 credits in Semester: 3,4,5 and 6 as specified in Annexure B for Honours in the respective specialization area. Annexure B: Bachelor of Computer Applications (Honours) in one of the following specializations 1. Data Science 2. Artificial Intelligence and Machine Learning 3. Cloud Computing 4. Data Security				
10.	FEE		Academic Fee p.a	Institute Deposit	Total	



Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications/ Bachelor of Computer
Applications (Honours)
Programme Structure 2022-25

	Indian Students	175000	20000	195000
	International Students (USD equivalent to INR)	265000	20000	285000

Note: For additional optional specialization 'Honours' an additional fees of Rs. 35000/- will be charged in the second year.

11. ASSESSMENT	All internal courses will have 100% component as internal evaluation at the institute level. All external courses will have 40% internal component and 60% external component [University] examination.
12. STANDARD OF PASSING	The assessment of students 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	Bachelor of Computer Applications (B.C.A.) will be awarded at the end of semester VI examination by taking into consideration the performance of all semester examinations after obtaining minimum 4.00 CGPA out of 10 CGPA. OR Bachelor of Computer Applications (Honours) with specialization in Data Science / Artificial Intelligence and Machine Learning / Cloud Computing / Data Security will be awarded at the end of semester VI examination by taking into consideration the performance of all semester examinations after obtaining minimum 4.00 CGPA out of 10 CGPA.

14. CLASSIFICATION OF CREDITS

Semester	Generic Core	Generic Elective	Specialization Core	Specialization Elective	Open Elective	Audit	Total
1	20	0	0	0	0	1*	20
2	20	0	0	0	0	1*	20
3	22	0	0	0	0	1*	22
4	18	10	0	0	0	0	28
5	8	8	0	0	0	0	16
6	0	14	0	0	0	0	14
Total	88	32	0	0	0	0	120
Credits for Honours (Optional)							
Total	0	0	24	0	0	0	24
Grand Total							144

* Satisfactory completion of the non letter grade courses 'Integrated Disaster Management', 'Fitness for Life', 'Core Environmental Studies' is mandatory for the award of degree.

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

THIS IS SYSTEM GENERATED DOCUMENT AND REQUIRES NO SIGNATURE.



Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications/ Bachelor of Computer Applications
(Honours)
Programme Structure 2022-25

Annexure A

Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Marks	External Marks	Total Marks
Semester : 1							
Generic Core Courses							
T3586	0301210101	Web Technologies		4	100	0	100
T3593	0301210102	Computational Thinking		4	40	60	100
T2495	0301210103	Business Communication		2	50	0	50
T3647	0301210104	Data Analytics using MS-Excel		2	20	30	50
T3239	0301210105	Relational Database Management System		4	40	60	100
T3213	0301210106	Introduction to Operating System		2	20	30	50
T3198	0301210107	Introduction to Python		2	20	30	50
T4005	0301210108	Integrated Disaster Management *		0	0	0	Non Letter Grade
Total				20	290	210	500
Semester : 2							
Generic Core Courses							
T3689	0301210201	Advanced Programming in Python		4	40	60	100
T3209	0301210202	Data Structures		2	20	30	50
T3205	0301210203	Web Development using CMS		2	50	0	50
T3224	0301210204	Network Essentials		2	20	30	50
T3200	0301210205	Linux Shell Scripting		2	20	30	50
T3606	0301210206	Software Engineering Practices		4	40	60	100
T3390	0301210207	SQL Programming		4	40	60	100
TH4095	0301210208	Fitness for Life *		0	0	0	Non Letter Grade
Total				20	230	270	500
Semester : 3							
Generic Core Courses							
T3202	0301210301	Object Oriented Programming		4	40	60	100
T3688	0301210302	Advance Data Structure and Algorithm		4	40	60	100
T3608	0301210303	Software Testing		4	40	60	100
T3693	0301210304	Web Development using Python		4	40	60	100
T3487	0301210305	Network Security Essentials		4	40	60	100
T3016	0301210306	PHP		2	20	30	50
T2883	0301210307	Core Environmental Studies *		0	0	0	Non Letter Grade
Total				22	220	330	550



Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications/ Bachelor of Computer Applications
(Honours)
Programme Structure 2022-25

Annexure A

Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Marks	External Marks	Total Marks
Semester : 4							
Generic Core Courses							
T8000	0301210401	Service Learning		4	100	0	100
T3237	0301210402	Foundations of Data Warehousing and Data Mining		4	40	60	100
T3371	0301210403	Introduction to Java Enterprise Framework		2	20	30	50
F0002	0301210404	Flexi-Credit Course		2	50	0	50
T3258	0301210405	Current Trends and Practices in IT		3	75	0	75
T3803	0301210406	Project		3	75	0	75
Total				18	360	90	450
Generic Elective Courses Group - I							
T6096	0301210407	Creative Writing		2	50	0	50
T6181	0301210408	Understanding Cinema		2	50	0	50
T6182	0301210409	Appreciating Cinema		2	50	0	50
T6246	0301210410	Music in Media I		2	50	0	50
T6255	0301210411	Introduction to Theatre		2	50	0	50
T6274	0301210412	Foundations of Ethics		2	50	0	50
T6334	0301210413	Basic Sociology		2	50	0	50
T6307	0301210414	Basic Psychology		2	50	0	50
Total Required Credits				2	50	0	50
Generic Elective Courses Group - II (Choose any one group - Group A or Group B or Group C)							
Generic Elective Courses Group - A							
T3663	0301210415	Introduction to Mobile Concepts		4	40	60	100
T3696	0301210416	Advance Web Scripting		4	40	60	100
Generic Elective Courses Group - B							
T3221	0301210417	Introduction to Cloud Computing		4	40	60	100
TE7019	0301210418	Big Data Analytics		4	40	60	100
Generic Elective Courses Group - C							
T3601	0301210419	Network Administration		4	40	60	100
T3690	0301210420	Computer Forensics - Detection and Prevention of IT Frauds		4	40	60	100
Total Required Credits				8	80	120	200
Semester : 5							
Generic Core Courses							
T3372	0301210501	Enterprise Application Development using JavaEE		4	40	60	100
T3694	0301210502	NoSQL Databases		2	20	30	50



Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications/ Bachelor of Computer Applications
(Honours)
Programme Structure 2022-25

Annexure A

Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Marks	External Marks	Total Marks
F0002	0301210503	Flexi-Credit Course		2	50	0	50
Total				8	110	90	200
Generic Elective Courses Group (Choose any one group - Group A or Group B or Group C)							
Generic Elective Courses Group - A							
T3201	0301210504	Mobile Programming		4	40	60	100
T3691	0301210505	Introduction to Web Services		2	20	30	50
T3692	0301210506	PHP Framework		2	20	30	50
Generic Elective Courses Group - B							
T3600	0301210507	Cloud Architectures and Security		4	40	60	100
TE7023	0301210508	Machine learning		4	40	60	100
Generic Elective Courses Group - C							
T3602	0301210509	Network Monitoring and Troubleshooting		4	40	60	100
T3222	0301210510	Introduction to Vulnerability Assessment Penetration Testing		4	40	60	100
Total Required Credits				8	80	120	200
Semester : 6							
Generic Elective Courses Group (Choose any one group - Group A or Group B)							
Generic Elective Courses Group - A							
F0002	0301210601	Flexi-Credit Course		2	50	0	50
T3912	0301210602	Industry Internship		12	120	180	300
Total Required Credits				14	170	180	350
Generic Elective Courses Group - B							
T3375	0301210603	Introduction to Dot Net Framework		2	20	30	50
F0004	0301210604	Flexi-Credit Course		4	100	0	100
T3808	0301210605	Project		8	80	120	200
Total Required Credits				14	200	150	350



Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications/ Bachelor of Computer Applications
(Honours)
Programme Structure 2022-25

Annexure A

Semester	Internal Credits	External Credits	Total Credits	Total Marks
Semester 1	6	14	20	500
Semester 2	2	18	20	500
Semester 3	0	22	22	550
Semester 4	14	14	28	700
Semester 5	2	14	16	400
Semester 6	4	10	14	350
Total	28	92	120	3000



Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications/ Bachelor of Computer Applications
(Honours)
Programme Structure 2022-25

Annexure B

Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Credits	External Credits	Total Marks
Semester : 3							
Specialization Core Courses : Data Science							
TE7265	0301210308	Introduction to Data Science	Data Science	3	30	45	75
TE7538	0301210309	Statistics for Data Science	Data Science	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Artificial Intelligence and Machine Learning							
T7473	0301210310	Artificial Intelligence	Artificial Intelligence and Machine Learning	3	30	45	75
T7529	0301210311	Machine Learning	Artificial Intelligence and Machine Learning	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Cloud Computing							
TE7249	0301210312	Cloud Computing Platforms	Cloud Computing	3	30	45	75
T3730	0301210313	Fog Computing	Cloud Computing	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Data Security							
TE7020	0301210314	Wireless Sensor Networks	Data Security	4	40	60	100
T3220	0301210315	Information Security	Data Security	2	20	30	50
Total				6	60	90	150
Semester : 4							
Specialization Core Courses : Data Science							
T6850	0301210421	Python for Data Science	Data Science	4	40	60	100
T3443	0301210422	Data preparation and Data management	Data Science	2	20	30	50
Total				6	60	90	150
Specialization Core Courses : Artificial Intelligence and Machine Learning							
TE7097	0301210423	Neural Network	Artificial Intelligence and Machine Learning	3	30	45	75
TE7103	0301210424	Natural Language Processing	Artificial Intelligence and Machine Learning	3	30	45	75
Total				6	60	90	150



Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications/ Bachelor of Computer Applications
(Honours)
Programme Structure 2022-25

Annexure B

Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Credits	External Credits	Total Marks
Specialization Core Courses : Cloud Computing							
T3727	0301210425	Cloud Programming and Application Development	Cloud Computing	3	30	45	75
T3725	0301210426	Cloud Administration	Cloud Computing	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Data Security							
TE7296	0301210427	Software Security	Data Security	3	30	45	75
T3540	0301210428	Identity and Access Management	Data Security	3	30	45	75
Total				6	60	90	150
Semester : 5							
Specialization Core Courses : Data Science							
T3684	0301210507	Advanced Big Data Analytics	Data Science	3	30	45	75
T3720	0301210508	Web Performance Analysis	Data Science	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Artificial Intelligence and Machine Learning							
TE7487	0301210509	Deep Learning	Artificial Intelligence and Machine Learning	3	30	45	75
T7573	0301210510	Image Processing & Pattern Recognition	Artificial Intelligence and Machine Learning	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Cloud Computing							
T3543	0301210511	Virtualization and Security	Cloud Computing	3	30	45	75
TE7250	0301210512	Cloud Environment in Public Model	Cloud Computing	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Data Security							
TE7457	0301210513	Cyber Security	Data Security	3	30	45	75
T3022	0301210514	Cryptography	Data Security	3	30	45	75
Total				6	60	90	150
Semester : 6							
Specialization Core Courses : Data Science							
T3636	0301210606	Quantum Machine Learning	Data Science	3	30	45	75



Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications/ Bachelor of Computer Applications
(Honours)
Programme Structure 2022-25

Annexure B

Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Credits	External Credits	Total Marks
T3364	0301210607	Data Management	Data Science	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Artificial Intelligence and Machine Learning							
TE7497	0301210608	Responsible AI	Artificial Intelligence and Machine Learning	3	30	45	75
T3699	0301210609	AI applications in social media	Artificial Intelligence and Machine Learning	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Cloud Computing							
T3726	0301210610	Cloud and AI	Cloud Computing	3	30	45	75
T3412	0301210611	Cloud Security	Cloud Computing	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Data Security							
TE7458	0301210612	Advanced Cyber Security	Data Security	4	40	60	100
T3381	0301210613	Information System Security Audit	Data Security	2	20	30	50
Total				6	60	90	150



Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications/ Bachelor of Computer Applications
(Honours)
Programme Structure 2022-25

Annexure B

Semester	Internal Credits	External Credits	Total Credits	Total Marks
Data Science				
Semester 3	0	6	6	150
Semester 4	0	6	6	150
Semester 5	0	6	6	150
Semester 6	0	6	6	150
Total	0	24	24	600
Artificial Intelligence and Machine Learning				
Semester 3	0	6	6	150
Semester 4	0	6	6	150
Semester 5	0	6	6	150
Semester 6	0	6	6	150
Total	0	24	24	600
Cloud Computing				
Semester 3	0	6	6	150
Semester 4	0	6	6	150
Semester 5	0	6	6	150
Semester 6	0	6	6	150
Total	0	24	24	600
Data Security				
Semester 3	0	6	6	150
Semester 4	0	6	6	150
Semester 5	0	6	6	150
Semester 6	0	6	6	150
Total	0	24	24	600