



Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications/ Bachelor of Computer Applications (Honours)
Programme Structure 2021-24

1. OBJECTIVE	<p>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.</p> <p>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.</p>				
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	<p>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.</p> <p>Annexure B: Bachelor of Computer Applications (Honours) in one of the following specializations</p> <ol style="list-style-type: none"> 1. Data Science 2. Artificial Intelligence and Machine Learning 3. Cloud Computing 4. Data Security 				
10. FEE		Academic Fee p.a	Institute Deposit	Total	



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		Indian Students	165000	10000	175000		
		International Students (USD equivalent to INR)	250000	10000	260000		
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	18	0	0	0	0	2*	18
2	20	0	0	0	0	1*	20
3	14	8	0	0	0	1*	22
4	18	10	0	0	0	0	28
5	8	8	0	0	0	0	16
6	0	16	0	0	0	0	16
Total	78	42	0	0	0	0	120
* Satisfactory completion of the non letter grade course 'Integrated Disaster Management', 'Fitness for Life' and , 'Core Environmental Studies' and 'Certificate in COVID-19 Care for the Community' is mandatory for the award of degree.							
The revised programme structure supersedes the previously approved programme structure dated 04/08/2023 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.

Director - 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							
T3586	0301210101	Web Technologies		4	100	0	100
T3593	0301210102	Computational Thinking		4	40	60	100
T2495	0301210103	Business Communication		2	50	0	50
T3322	0301210104	Elements of Mathematics		2	20	30	50
T3244	0301210105	Introduction to Database Management System		2	20	30	50
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
TH4272	0301210109	Certificate in COVID-19 Care for the Community *		0	0	0	Non - Letter Grade
Total				18	270	180	450
Semester : 2							
Generic Core Courses							
T3610	0301210201	Applications of Spreadsheets in Business		4	100	0	100
T3206	0301210202	Advanced Programming in Python		2	20	30	50
T3209	0301210203	Data Structures		2	20	30	50
T3200	0301210204	Linux Shell Scripting		2	20	30	50
T3224	0301210205	Network Essentials		2	20	30	50
T3205	0301210206	Web Development using CMS		2	50	0	50
T2981	0301210207	Introduction to Startup		2	50	0	50
T3605	0301210208	Elements of System and Software Development		2	20	30	50
T3609	0301210209	Structured Query Language		2	20	30	50
TH4095	0301210210	Fitness for Life *		0	0	0	Non - Letter Grade
Total				20	320	180	500
Semester : 3							
Generic Core Courses							
T3202	0301210301	Object Oriented Programming		4	40	60	100
T3595	0301210302	Design and Implementation of Algorithms		4	40	60	100



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T3606	0301210303	Software Engineering Practices		4	40	60	100
T3474	0301210304	Web Development using Python		2	20	30	50
T2883	0301210305	Core Environmental Studies *		0	0	0	Non - Letter Grade
Total				14	140	210	350
Generic Elective Course Group							
T3221	0301210306	Introduction to Cloud Computing		4	40	60	100
T3237	0301210307	Foundations of Data Warehousing and Data Mining		4	40	60	100
T3663	0301210308	Introduction to Mobile Concepts		4	40	60	100
Total Required Credits				8	80	120	200
Semester : 4							
Generic Core Courses							
T8000	0301210401	Service Learning		4	100	0	100
T3607	0301210402	Software Project Practices		4	40	60	100
T3258	0301210403	Current Trends and Practices in IT		3	75	0	75
T3803	0301210404	Project		3	75	0	75
T3371	0301210405	Introduction to Java Enterprise Framework		2	20	30	50
T3649	0301210406	Introduction to Blockchain Technologies		2	50	0	50
Total				18	360	90	450
Generic Elective Courses Group - I							
T3201	0301210407	Mobile Programming		4	40	60	100
TE7019	0301210408	Big Data Analytics		4	40	60	100
T3599	0301210409	Cloud Application Development		4	40	60	100
Total Required Credits				8	80	120	200
Generic Elective Courses Group - II							
T6096	0301210410	Creative Writing		2	50	0	50
T6181	0301210411	Understanding Cinema		2	50	0	50
T6182	0301210412	Appreciating Cinema		2	50	0	50
T6246	0301210413	Music in Media I		2	50	0	50
T6255	0301210414	Introduction to Theatre		2	50	0	50
T6274	0301210415	Foundations of Ethics		2	50	0	50
T6334	0301210416	Basic Sociology		2	50	0	50



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Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Marks	External Marks	Total Marks
T6307	0301210417	Basic Psychology		2	50	0	50
Total Required Credits				2	50	0	50
GIP							
G3026	0301210426	Global Immersion Programme		26	0	650	650
Note: For students under Global Immersion Programme (0301210426), courses "Service Learning" (0301210401), "Software Project Practices" (0301210402), "Current Trends and Practices in IT" (0301210403), "Project" (0301210404), "Introduction to Java Enterprise Framework" (0301210405), "Introduction to Blockchain Technologies" (0301210406), "Mobile Programming" (0301210407), "Cloud Application Development" (0301210409) will be waived off.							
Semester : 5							
Generic Core Courses							
T3608	0301210501	Software Testing		4	40	60	100
T1234	0301210502	Information Technology and Regulatory Compliance		2	20	30	50
T3739	0301210503	Agile Methodologies		2	50	0	50
Total				8	110	90	200
Generic Elective Course Group							
T3588	0301210504	Game Design		4	40	60	100
T3612	0301210505	Data Visualization		4	40	60	100
T3600	0301210506	Cloud Architectures and Security		4	40	60	100
Total Required Credits				8	80	120	200
Semester : 6							
Generic Elective Courses Group - A							
T3912	0301210601	Industry Internship		12	120	180	300
T3354	0301210602	Information Technology for Management		4	100	0	100
Total Required Credits				16	220	180	400
Generic Elective Courses Group - B							
T3354	0301210602	Information Technology for Management		4	100	0	100
T3812	0301210603	Project		12	120	180	300
Total Required Credits				16	220	180	400



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Semester	Internal Credits	External Credits	Total Credits	Total Marks
Semester 1	6	12	18	450
Semester 2	8	12	20	500
Semester 3	0	22	22	550
Semester 4	14	14	28	700
Semester 5	2	14	16	400
Semester 6	4	12	16	400
Total	34	86	120	3000



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Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Credits	External Credits	Total Marks
Specialization Core Courses : Data Science							
TE7265	0301210309	Introduction to Data Science	Data Science	3	30	45	75
TE7538	0301210310	Statistics for Data Science	Data Science	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Artificial Intelligence and Machine Learning							
T7473	0301210311	Artificial Intelligence	Artificial Intelligence and Machine Learning	3	30	45	75
T7529	0301210312	Machine Learning	Artificial Intelligence and Machine Learning	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Cloud Computing							
TE7249	0301210313	Cloud Computing Platforms	Cloud Computing	3	30	45	75
T3730	0301210314	Fog Computing	Cloud Computing	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Data Security							
T3222	0301210315	Introduction to Vulnerability Assessment Penetration Testing	Data Security	4	40	60	100
T3220	0301210316	Information Security	Data Security	2	20	30	50
Total				6	60	90	150
Specialization Core Courses : Data Science							
T6850	0301210418	Python for Data Science	Data Science	4	40	60	100
T3647	0301210419	Data Analytics using MS-Excel	Data Science	2	20	30	50
Total				6	60	90	150
Specialization Core Courses : Artificial Intelligence and Machine Learning							
TE7097	0301210420	Neural Network	Artificial Intelligence and Machine Learning	3	30	45	75
TE7103	0301210421	Natural Language Processing	Artificial Intelligence and Machine Learning	3	30	45	75
Total				6	60	90	150



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Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Credits	External Credits	Total Marks
Specialization Core Courses : Cloud Computing							
T3727	0301210422	Cloud Programming and Application Development	Cloud Computing	3	30	45	75
T3725	0301210423	Cloud Administration	Cloud Computing	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Data Security							
TE7296	0301210424	Software Security	Data Security	3	30	45	75
T3540	0301210425	Identity and Access Management	Data Security	3	30	45	75
Total				6	60	90	150
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
Specialization Core Courses : Data Science							



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Catalog Course Code	Course Code	Course Title	Specialization	Credit	Internal Credits	External Credits	Total Marks
T3636	0301210604	Quantum Machine Learning	Data Science	3	30	45	75
T3364	0301210605	Data Management	Data Science	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Artificial Intelligence and Machine Learning							
TE7497	0301210606	Responsible AI	Artificial Intelligence and Machine Learning	3	30	45	75
T3699	0301210607	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	0301210608	Cloud and AI	Cloud Computing	3	30	45	75
T3412	0301210609	Cloud Security	Cloud Computing	3	30	45	75
Total				6	60	90	150
Specialization Core Courses : Data Security							
T3690	0301210610	Computer Forensics - Detection and Prevention of IT Frauds	Data Security	4	40	60	100
T3381	0301210611	Information System Security Audit	Data Security	2	20	30	50
Total				6	60	90	150



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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