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SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)

(Established under section 3 of the UGC Act, 1956)
Re-accredited by NAAC with 'A++' Grade | Awarded Category – I by UGC
Founder: Prof. Dr. S. B. Mujumdar, M. Sc., Ph. D. (Awarded Padma Bhushan and Padma Shri by President of India)

SIU/ACAD/2026/3353 Date: 19/08/2026

To
The Director
Symbiosis Institute of Computer Studies and Research,
Pune

Reference: SIU letter no **SIU/ACAD/2024/2924 dated 09/07/2024, SIU/ACAD/2024/3495 dated 21/08/2024, SIU/ACAD/2025/3613 dated 10/09/2025, SIU/ACAD/2026/1194 dated 24/03/2026** regarding of programme structure of batch 2024-2028.

Subject: Approval of the Revised Programme Structure of Bachelor of Computer Applications Honours/Honours with Research, batch 2024-28.

Dear Sir,

Please find attached the revised programme structure of Bachelor of Computer Applications Honours/Honours with Research, batch 2024-28.

The revised programme structure supersedes the previously approved programme structures referred in the above letter.

Sr. No.	Programme	Revision No.
1	Bachelor of Computer Applications Honours/Honours with Research	R04

Thanking you.

Sincerely,

Dr. Asmita Dani
Dean- Academics

Copy to: Controller of Examinations, SIU

Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications Honours/Honours with Research
Programme Structure 2024-28

<table>
<tr><td>1.</td><td>OBJECTIVE</td><td colspan="5">BCA (Honours/Honours with Research) 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/Honours with Research) 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.</td></tr>
<tr><td>2.</td><td>DURATION (IN MONTHS)</td><td colspan="5">48 (Full Time) With Multiple Entry and Multiple Exit Options</td></tr>
<tr><td>3.</td><td>INTAKE</td><td colspan="5">180</td></tr>
<tr><td rowspan="4">4.</td><td rowspan="4">RESERVATION</td><td rowspan="2">I. Within the sanctioned intake</td><td>a) SC (In Percentage)</td><td>b) ST (In Percentage)</td><td>c) Differently abled (In Percentage)</td><td>d) Defence (In Percentage)</td></tr>
<tr><td>15</td><td>7.5</td><td>3</td><td>5</td></tr>
<tr><td rowspan="2">II. Over and above the sanctioned intake</td><td colspan="2">a) Kashmiri Migrants (In Seats)</td><td colspan="2">b) International Students (In Percentage)</td></tr>
<tr><td colspan="2">2</td><td colspan="2">20</td></tr>
<tr><td>5.</td><td>ELIGIBILITY</td><td colspan="5">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).
Students who wish to opt for Honours with Research must earn 7.5 CGPA and above at the end of Semester-6
Eligibility Criteria for the Multiple entries would be as per University's Lateral Entry Rules for FYUG Programmes</td></tr>
</table>

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6.	**SELECTION PROCEDURE**	Symbiosis Entrance Test, Personal Interaction and Writing Ability Test (PI-WAT). Selection Procedure for the Multiple Entry would be as per the University's Lateral Entry Rules for FYUG Programmes			
7.	**MEDIUM OF INSTRUCTION**	English			
8.	**PROGRAMME PATTERN**	Semester			
9.	**COURSE & SPECIALIZATION**	As per Annexure A **List of Majors Offered (Choose any one)** 1. Data Science 2. Artificial Intelligence and Machine Learning 3. Cloud Computing 4. Data Security **List of Minors Offered (Choose any one)** 1. Software Development 2. System Administration 3. Database Administration			
10.	**FEE**		**Academic Fee p. a**	**Institute Deposit**	**Total**
		Indian Students (Amount in INR)	2,13,000/-	20,000/-	2,33,000/-
		International Students – **NRI/ PIO/ OCI Category (Amount in US$)**	4,070	275	4,345
		International Students – **Foreign National Category (Amount in US$)**	1,300	275	1,575
	Note- The exiting students will have to complete the additional 4 credit vocational course for the award of a Certificate/ Diploma by paying additional fees at the time of intimation of the exit. The additional fees of 4 credit vocational course will be informed in due course of time.				
11.	**ASSESSMENT**	The courses will have 60% Continuous Assessment and 40% Term End [University] examination however, some courses (not more than 30% of the total programme credits) may have 100% Continuous Assessment.			

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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 4.00 out of maximum of 10 CGPA for the programme.
13.	**AWARD OF DEGREE/ DIPLOMA/ CERTIFICATE**	**Certificate** in Computer Applications will be awarded at the end of the semester 2 by taking into consideration the performance of all semester examinations after obtaining minimum 4.00 CGPA out of 10 CGPA and the successful completion of the 4 credit Vocational Course in the summer. **Diploma** in Computer Applications will be awarded at the end of the semester 4 by taking into consideration the performance of all semester examinations after obtaining minimum 4.00 CGPA out of 10 CGPA and the successful completion of the 4 credit Vocational Course in the summer. **Bachelor** of Computer Applications with the applicable major and applicable minor will be awarded at the end of the semester 6 examination by taking into consideration the performance of all semester examinations after obtaining minimum 4.00 CGPA out of 10 CGPA. **Bachelor** of Computer Applications **Honours** with the applicable major and applicable minor will be awarded at the end of the semester 8 examination by taking into consideration the performance of all semester examinations after obtaining minimum 4.00 CGPA out of 10 CGPA **Bachelor** of Computer Applications **Honours with Research** with the applicable major and applicable minor will be awarded at the end of the semester 8 examination by taking into consideration the performance of all semester examinations after obtaining minimum 4.00 CGPA out of 10 CGPA.

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14.	CLASSIFICATION OF CREDITS AND NUMBER OF NON-CREDIT COURSES										
Semester	**Major**	**Minor**	**Multi-disciplinary**	**Ability Enhancement**	**Skill Enhancement**	**Common Value Added**	**Summer Internship**	**Research Project / Dissertation**	**Total Credits**	**No. of Mandatory Non-Credit Course/s**	**No. of Non-Credi Audit Course/s**
1	8	4	0	3	3	3	0	0	**21**	0	
2	4	4	3	2	4	3	0	0	**20**	1	
3	10	2	3	3	2	0	0	0	**20**	1	
4	10	8	3	0	0	0	0	0	**21**	1	
5	16	4	0	0	0	0	0	0	**20**	1	
6	14	2	0	0	0	0	4	0	**20**	0	As per the Student's Choice
Total	**62**	**24**	**9**	**8**	**9**	**6**	**4**	**0**	**122**		
Honours											
7	12	4	0	0	0	0	0	4	**20**	0	
8	12	6	0	0	0	0	0	4	**22**	0	
Total	**86**	**34**	**9**	**8**	**9**	**6**	**4**	**8**	**164**		
Honours with Research											
7	16	4	0	0	0	0	0	0	**20**	0	
8	6	4	0	0	0	0	0	12	**22**	0	
Total	**84**	**32**	**9**	**8**	**9**	**6**	**4**	**12**	**164**		

1. The students exiting the Programme after Semester – 2 OR Semester – 4 should complete vocational courses of total 4 credits in the summer to obtain the Certificate/Diploma.
2. Passing Mandatory Non-Credit Courses is a requirement for the award of the 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.
Director - Academics

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Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications (Honours/Honours with Research)
Programme Structure 2024-28

Annexure A

Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
Semester – 1							
Major Course							
T3586	0301240101	Web Technologies		4	100	0	100
T2713	0301240102	Innovation Management and New Product Development		4	60	40	100
Minor Course							
T3593	0301240103	Computational Thinking		4	60	40	100
Ability Enhancement Course							
T5708	0301240104	Introduction to Communication Skills		3	75	0	75
Skill Enhancement Courses							
TE7556	0301240105	Introduction to Python Programming		3	45	30	75
Common Value-Added Course							
TH4521	0301240106	Yoga and Mental Health		3	75	0	75
			Grand Total	**21**	**415**	**110**	**525**
Semester – 2							
Major Course							

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Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
T3239	0301240201	Relational Database Management System		4	60	40	100
Minor Course							
T7549	0301240202	Data Structures and Algorithms		4	60	40	100
Ability Enhancement Course							
T6483	0301240203	Creative Writing		2	50	0	50
Skill Enhancement Course							
T3204	0301240204	Server-Side Web Technology		4	60	40	100
Common Value-Added Courses							
T4780	0301240205	Yoga Therapy Principles and Practices		3	75	0	75
Mandatory Non-Credit Course							
TH4788	0301240206	Health and Wellness Module I		0	0	0	0
Multidisciplinary Courses (Choose Any One Course from the University Basket of Multidisciplinary Courses given in Annexure B)							
-	-	MD1		3	75	0	75
			Grand Total	**20**	**380**	**120**	**500**
Vocational Courses (Summer) (Only for students who wish to exit after the First Year with a Certificate)							
T3610	0301240207	Applications of Spreadsheets in Business		4	100	0	100
			Total Required Credits	**4**	**100**	**0**	**100**

Note: Students exiting at the end of the second semester and earning 41 credits will be awarded a "Certificate in Computer Applications" provided they successfully complete the additional 4 credits of vocational course offered during the summer term.

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Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
Semester – 3							
Major Courses							
T7998	0301240301	Operating Systems		4	60	40	100
T3609	0301240302	Structured Query Language		2	30	20	50
T3224	0301240303	Network Essentials		2	30	20	50
T3394	0301240304	Internet of Things		2	30	20	50
Minor Course							
T3740	0301240305	Software Engineering		2	30	20	50
Ability Enhancement Courses							
T6754	0301240306	Business and Managerial Communication		3	75	0	75
Skill Enhancement Course							
T3577	0301240307	Data Analysis Using Python		2	30	20	50
Mandatory Non-Credit Course							
TH4789	0301240308	Health and Wellness Module II		0	0	0	0
Multidisciplinary Courses (Choose Any One Course from the University Basket of Multidisciplinary Courses given in Annexure B)							
-	-	MD2		3	75	0	75
			Grand Total	**20**	**360**	**140**	**500**
Semester - 4							
Major Courses							

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Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
T3221	0301240401	Introduction to Cloud Computing		4	60	40	100
T3237	0301240402	Foundations of Data Warehousing and Data Mining		4	60	40	100
T8000	0301240403	Service Learning		2	50	0	50
Minor Courses							
T7999	0301240404	Java Programming		4	60	40	100
T3487	0301240405	Network Security Essentials		4	60	40	100
Mandatory Non-Credit Course							
SMC002	0301240406	Core Environmental Studies		0	0	0	0
Multidisciplinary Courses (Choose Any One Course from the University Basket of Multidisciplinary Courses given in Annexure B)							
-	-	MD3		3	75	0	75
			Grand Total	**21**	**365**	**160**	**525**
Vocational Courses (Summer) (Only for students who wish to exit after the Second Year with a Diploma)							
T3610	0301240407	Applications of Spreadsheets in Business		4	100	0	100
			Total Required Credits	**4**	**100**	**0**	**100**
GIP							
GA3005	0301240408	Global Immersion Programme - Academic		5	0	125	125
T3801	0301240409	Project		1	25	0	25

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Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
Note: For students under Global Immersion Programme – Academic (0301240408) courses "Foundations of Data Warehousing & Data Mining" (0301240402) and Service Learning (0301240403) will be waived off. Students will have to additionally complete 1 credit "Project" (0301240409)							
Note: Students exiting at the end of the fourth semester and earning 82 credits will be awarded a "Diploma in Computer Applications," provided they successfully complete the additional 4 credits of vocational courses offered during the summer term.							
Semester - 5							
Major Courses							
T2208	0301240501	Research Methodology		4	60	40	100
T3009	0301240502	Best Programming Practices		2	30	20	50
T2645	0301240503	Lean Startup		2	30	20	50
Major Courses (Choose Any One Group)							
Group 1 - Data Science							
T6967	0301240504	Data Science I	Data Science	4	60	40	100
T3604	0301240505	Essentials of Business Intelligence	Data Science	4	60	40	100
Group 2 - Artificial Intelligence and Machine Learning							
TE7453	0301240506	Introduction to Artificial Intelligence	Artificial Intelligence and Machine Learning	4	60	40	100
TE7023	0301240507	Machine Learning	Artificial Intelligence and Machine Learning	4	60	40	100

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Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
Group 3 - Cloud Computing							
T3674	0301240508	Cloud Applications for Business Processes	Cloud Computing	4	60	40	100
T3600	0301240509	Cloud Architectures and Security	Cloud Computing	4	60	40	100
Group 4 - Data Security							
T3222	0301240510	Introduction to Vulnerability Assessment Penetration Testing	Data Security	4	60	40	100
T1235	0301240511	Law Relating to Information Technology	Data Security	4	60	40	100
		Total Required Credits		**8**	**120**	**80**	**200**
Minor Courses (Choose Any One Group)							
Group 1 – Software Development							
T3201	0301240512	Mobile Programming	Software Development	4	60	40	100
Group 2 - System Administration							
T3601	0301240513	Network Administration	System Administration	4	60	40	100
Group 3 - Database Administration							
T7522	0301240514	Advanced Databases	Database Administration	4	60	40	100
		Total Required Credits		**4**	**60**	**40**	**100**
Mandatory Non-Credit Course							
SMC001	0301240515	Vasudhaiva Kutumbakam		0	0	0	0
		Grand Total		**20**	**300**	**200**	**500**
Semester – 6							

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Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
Major Courses							
T3264	0301240601	Basic of Java Enterprise Technology		4	60	40	100
F0002	0301240602	Flexi-credit Course		2	50	0	50
Major Courses (Choose Any One Group)							
Group 1 – Data Science							
T3510	0301240603	Big Data: Storage and Analytics	Data Science	4	60	40	100
TE7281	0301240604	Open Source Tools for Data Science	Data Science	4	60	40	100
Group 2 – Artificial Intelligence and Machine Learning							
TE7022	0301240605	Predictive Analytics	Artificial Intelligence and Machine Learning	4	60	40	100
TE7912	0301240606	Supervised Machine Learning and Advances	Artificial Intelligence and Machine Learning	4	60	40	100
Group 3 – Cloud Computing							
T3752	0301240607	Fog Computing and edge computing	Cloud Computing	4	60	40	100
T3750	0301240608	Cloud administration and Management	Cloud Computing	4	60	40	100
Group 4 – Data Security							
T3748	0301240609	Data Privacy and identity Access Control	Data Security	4	60	40	100
TE7252	0301240610	Cryptography	Data Security	4	60	40	100
Total Required Credits				**8**	**120**	**80**	**200**
Minor Courses (Choose Any One Group)							
Group 1 – Software Development							

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Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
T3691	0301240611	Introduction to web services	Software Development	2	30	20	50
Group 2 – System Administration							
T3175	0301240612	Network Design	System Administration	2	30	20	50
Group 3 – Database Administration							
T3529	0301240613	NoSQL Databases	Database Administration	2	30	20	50
			Total Required Credits	**2**	**30**	**20**	**50**
Summer Internship							
T3904	0301240614	Summer Internship		4	60	40	100
			Grand Total	**20**	**320**	**180**	**500**
Note: Students exiting at the end of the sixth semester and earning 122 credits will be awarded a "Bachelor of Computer Applications" degree. Total Credits at the end of the Third year (Major 62, Minor 24, Multidisciplinary 9, Ability Enhancement Courses 8, Skill Enhancement Courses 9, Summer Internship 4, Common Value-Added Courses 6).							
Semester – 7 (Honours)							
Major Courses							
T3536	0301240701	Web UI and Content Management		4	60	40	100
T5514	0301240702	Design Thinking and Problem Solving		2	30	20	50
Major Courses (Choose Any One Group)							
Group 1 – Data Science							
T6850	0301240703	Python for Data Science	Data Science	4	60	40	100
T3647	0301240704	Data Analytics using MS-Excel	Data Science	2	30	20	50
Group 2 – Artificial Intelligence and Machine Learning							

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Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
TEE7022	0301240705	Natural Language and Responsive AI	Artificial Intelligence and Machine Learning	4	60	40	100
T3736	0301240706	Deep learning	Artificial Intelligence and Machine Learning	2	30	20	50
Group 3 – Cloud Computing							
T3753	0301240707	Grid Computing and Utility computing	Cloud Computing	4	60	40	100
T2894	0301240708	Cloud-based Solution Architecture	Cloud Computing	2	30	20	50
Group 4 – Data Security							
TE7458	0301240709	Advanced Cyber Security	Data Security	4	60	40	100
T3044	0301240710	Security Management Practices	Data Security	2	30	20	50
Total Required Credits				**6**	**90**	**60**	**150**
Minor Courses (Choose Any One Group)							
Group 1 – Software Development							
T3374	0301240711	Advance Android Programming	Software Development	4	60	40	100
Group 2 – System Administration							
T3602	0301240712	Network Monitoring and Troubleshooting	System Administration	4	60	40	100
Group 3 – Database Administration							
T3749	0301240713	Database Security and Performance Tuning	Database Administration	4	60	40	100
Total Required Credits				**4**	**60**	**40**	**100**
Dissertation							
T3704	0301240714	Dissertation		4	100	0	100

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Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
			Grand Total	**20**	**340**	**160**	**500**
Semester – 7 (Honours with Research)							
Major Courses							
THM6020	0301240715	Literature Review		4	60	40	100
THM6022	0301240716	Scientific Paper Writing		4	60	40	100
THM6021	0301240717	Ethics in Research		4	60	40	100
T3744	0301240718	R Programming		4	60	40	100
Minor Course							
T3804	0301240719	Project		4	100	0	100
			Grand Total	**20**	**340**	**160**	**500**
Semester – 8 (Honours)							
Major Course							
T3242	0301240801	Software Quality Management and Standards		4	60	40	100
F0002	0301240802	Flexi-credit Course		2	50	0	50
Major Courses (Choose Any One Group)							
Group 1- Data Science							
T6987	0301240803	Statistical Machine Learning	Data Science	4	60	40	100
T6988	0301240804	Text Mining	Data Science	2	30	20	50
Group 2 - Artificial Intelligence and Machine Learning							
T3612	0301240805	Data Visualisation	Artificial Intelligence and Machine Learning	4	60	40	100

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Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
T3794	0301240806	Multimodal Machine Learning	Artificial Intelligence and Machine Learning	2	30	20	50
Group 3 - Cloud Computing							
T3751	0301240807	Cloud data Centre management	Cloud Computing	4	60	40	100
T3026	0301240808	High Performance Computing	Cloud Computing	2	30	20	50
Group 4 - Data Security							
T3053	0301240809	Server Security and Hardening	Data Security	4	60	40	100
T3036	0301240810	Information Risk Management	Data Security	2	30	20	50
Total Required Credits				**6**	**90**	**60**	**150**
Minor Course							
T3344	0301240811	DevOps		2	30	20	50
Minor Courses (Choose Any One Group)							
Group 1 - Software Development							
T3469	0301240812	Advance Web Scripting	Software Development	4	60	40	100
Group 2 - System Administration							
T3690	0301240813	Computer Forensics - Detection and Prevention of IT Frauds	System Administration	4	60	40	100
Group 3 - Database Administration							
T3396	0301240814	Database Technologies	Database Administration	4	60	40	100
Total Required Credits				**4**	**60**	**40**	**100**
Project							

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Catalogue Course Code	Course Code	Course Title	Major / Minor	Credits	Continuous Assessment Marks	Term End Examination Marks	Total Marks
T3804	0301240815	Project		4	100	0	100
		Grand Total		**22**	**390**	**160**	**550**
Semester: 8 (Honours with Research)							
Major Course							
T1743	0301240816	Intellectual Property Rights		4	60	40	100
F0002	0301240802	Flexi-credit Course		2	50	0	50
Minor Course							
T3743	0301240817	Research Funding		4	100	0	100
Research Project							
T3812	0301240818	Research Project		12	180	120	300
		Grand Total		**22**	**390**	**160**	**550**

Note: Total Credits at the end of Fourth year Bachelor of Computer Applications–Honours - 164 (Major 86, Minor 34, Multidisciplinary 9, Ability Enhancement Courses 8, Skill Enhancement Courses 9, Summer Internship 4, Research Project 8, Common Value-Added Courses 6).

Total Credits at the end of Fourth year for Bachelor of Computer Applications-Honours with Research – 164 (Major 84, Minor 32, Multidisciplinary 9, Ability Enhancement Courses 8, Skill Enhancement Courses 9, Summer Internship 4, Dissertation 12, Common Value-Added Courses 6).

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Symbiosis Institute of Computer Studies and Research, Pune
Bachelor of Computer Applications - Honours/Honours with Research
Programme Structure 2024-28

SUMMARY

Semester	100% Continuous Assessment Credits	Term End (University) Examination Credits	Total Credits	Total Marks
1	10	11	21	525
2	8	12	20	500
3	6	14	20	500
4	5	16	21	525
5	0	20	20	500
6	2	18	20	500
Total	**31**	**91**	**122**	**3050**
Honours				
7	4	16	20	500
8	6	16	22	550
Total	**41**	**123**	**164**	**4100**
Honours with Research				
7	4	16	20	500
8	6	16	22	550
Total	**41**	**123**	**164**	**4100**

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