



TULSIRAMJI GAIKWAD-PATIL COLLEGE OF ENGINEERING & TECHNOLOGY

Wardha Road, Nagpur - 441108

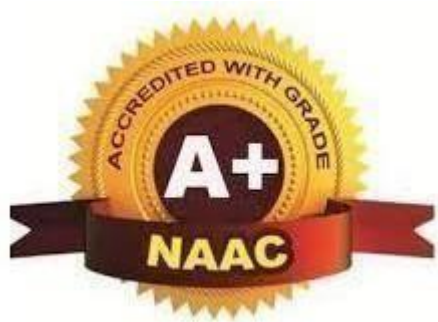
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Approved by AICTE, New Delhi, Govt. of Maharashtra

(An Autonomous Institution Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur)



An Autonomous Institute



**Department of Computer Applications
(UG)**

**Bachelor of Computer Applications
BCA**

Teaching Scheme

Considering

**National Education
Policy 2020**

From

Academic Year 2025-26

Designed as per AICTE Model Curriculum 2024 for BCA

Vision of Institute

To emerge as a learning center of excellence in the national ethos in domains of science, technology and management.

Mission of Institute

- To strive for rearing standard and stature of the students by practicing high standards of professional ethics, transparency and accountability.
- To provide facilities and services to meet the challenges of industry and society.
- To facilitate socially responsive research, innovation and entrepreneurship.
- To ascertain holistic development of the students and staff members by inculcating knowledge and profession as work practices.

Vision of the Department

To be the source of bringing out globally competent pioneering computing professionals, researchers, innovators and entrepreneurs and thereby succeed and contribute value to the knowledge-based economy and society.

Mission of the Department

- To enhance the placement ratio of the department.
- To get more industry interaction and partnership with skill India mission.
- To enhance the teaching learning facilities with digital India mission.
- To promote technical culture in the department.
- To launch an international journal at departmental level.
- To increase the frequency of national/international level workshops and conferences.
- To promote visit of prominent personalities in the department at a more regular basis.

Course Structure and Credit Distribution



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Definition of credit	
1 Hr. theory (T) per week	1 Credit
1 Hr. practical (P) per week	0.5 Credit
2 Hrs. practical (P) per week	1 Credit

Course code and Definition

Course Code	Definition
L	Lecture
T	Tutorial
P	Practical
DSC	Discipline Specific Course
CoC	Co-Curricular Course
AEC	Ability Enhancement Course
MDE	Multi-Disciplinary Elective Course
IKS	Indian Knowledge System
VAC	Value added Course
VEC	Value Education Course
SEC	Skill Enhancement Course
DSE	Discipline Specific Elective
OJT	On Job Training
RP	Research Project
CA	Class Assessment
CIE	Continuous Internal Evaluation

Course Name: Bachelor of Computer Applications, Bachelor of Computer Applications (Honours) and Bachelor of Computer Applications (Honours with Research)

Eligibility:

- A student having a valid CET Score in BCA-CET or any other equivalent CET score and other norms laid down by AICTE/ DTE from Time-to-time regarding admission process.

AND

- Any other Equivalent Examination of any State in (10+2) pattern with science subjects, English and other modern Indian languages together with Mathematics or an examination recognized as equivalent thereto in such subjects and with such standards of attainments

as may be prescribed.

Course Level/ Duration/ System: Undergraduate / Three or Four years/6 or 8 semesters with multiple entry and exit.

The following option will be made available to the students joining BCA research program:

- **One year:** Under Graduate Certificate in Computer Applications
- **Two years:** Under Graduate Diploma in Computer Applications
- **Three years:** Under Graduate Degree in Bachelor of Computer Applications (BCA)
- **Four years:** Bachelor of Computer Applications with Honours: BCA (Honours) or Bachelor of Computer Applications Honours with Research: BCA (Honours with Research)

Minimum Eligibility Criteria: Minimum eligibility criteria for opting the course in the fourth year will be as follows:

1. **BCA (Honours with Research):** Minimum 75% marks or equivalent CGPA in BCA Degree up to 6th semester.
2. **For BCA (Honours):** BCA Degree

Note: The students who are eligible for BCA (Honours with Research) shall have choice to pursue either BCA (Honours) or BCA (Honours with Research).



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Semester wise Credit Distribution

BCA Program

BCA (Honours) and BCA (Honours with Research)

Category	DSC	SEC	AEC	MDE	VAC	DSE	Total Credit Points
I	8	5	4	2	2	0	21
II	12	6	2	0	2	0	22
III	8	8	0	0	0	4	20
IV	16	2	0	0	0	2	20
V	15	6	0	0	0	0	21
VI	5	4	1	0	0	10	20
BCA (Honours)							
VII	5	4	0	3	0	8	20
VIII	0	8	0	0	0	12	20
BCA (Honours and Research)							
VII	12	0	0	0	0	8	20
VIII	0	20	0	0	0	0	20

Description	DSC	SEC	AEC	MDE	VAC	DSE	Total
BCA	64	31	7	2	4	16	124
BCA (Honours)	5	12	0	3	0	20	40
BCA (Honours with Research)	12	20	0	0	0	8	40

For 3 years BCA program: Total Credits 124

For 4 years BCA (Honours) and BCA (Honours with Research) program: Total Credits 164

Course Level/Duration/System:

Undergraduate / Three or Four years/6 or 8 Semesters with multiple entry and exit. The following option will be made available to the students joining BCA Program:

- One year: Under Graduate Certificate in Computer Applications
- Two years: Under Graduate Diploma in Computer Applications
- Three years: Bachelor of Computer Applications (BCA) Degree
- Four years: Bachelor of Computer Applications with Honours: BCA (Honours) / Bachelor of Computer Applications Honours with Research: BCA (Honours with Research)



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INDUCTION PROGRAM

Three weeks Induction program is mandatory which should include following:

- Physical Activity
- Creative Arts
- Universal Human Values
- Literary
- Proficiency Modules
- Lectures by Eminent People
- Visits to Local Areas
- Familiarization to Department/Branch & Innovations

Mandatory Visits/ Workshop/ Expert Lectures:

1. It is mandatory to arrange the industrial visits every semester for the students.
2. It is mandatory to conduct a One-week workshop during the winter break after fifth semester on professional/ industry/ entrepreneurial orientation.
3. It is mandatory to organize at least one expert lecture per semester by inviting resource persons from domain specific industry.

For Summer Internship / Projects / Seminar etc.

1. Evaluation is based on work done, quality of report, performance in viva-voce and presentation etc.

***Note:** The internal assessment is based on the student's performance in mid semester tests (two best out of three which may be open book/ online internet based), quizzes, assignments, class performance, attendance, viva-voce in practical, lab record etc.*



Mapping of Marks to Grades

Each course (Theory/Practical) is to be assigned 100 marks, irrespective of the number of credits, and the mapping of marks to grades may be done as per the following table:

Table showing method for conversion of marks into Grades			
Range of marks			Grades
$\geq X + 1.5\sigma$			O
$\geq X + 1.0\sigma$	to	$< X + 1.5\sigma$	A+
$\geq X + 1.5\sigma$	to	$< X + 1.0\sigma$	A
$\geq X$	to	$< X + 0.5\sigma$	B+
$\geq X - 1.5\sigma$	to	$< X$	B
$\geq X - 1.0\sigma$	to	$< X - 0.5\sigma$	C
$\geq X - 1.5\sigma$	to	$< X - 1.0\sigma$	D
$< X - 1.5\sigma$			F
Where X is arithmetic mean and σ is Standard deviation			

Formula for Calculation of SGPA:

- 1) $[GPV]_i = [CXGP]_i$
- 2) $\sum GPV = \sum_{i=1}^n C_i \times GP_i$ (n=Courses of the semester)
- 3) $SGPA = \sum GPV / \sum C$
- 4) Conversion of SGPA to Percentage: $SGPA \times 10 = __\%$

CGPA and Class:

CGPA	Class
≥ 8.25	First Class with Distinction
≥ 6.75 and < 8.25	First Class
≥ 5.75 and < 6.75	Second Class
< 5.75	Fail



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SCHEME OF INSTRUCTION

Programme: Bachelor of Computer Applications

First Year Bachelor of Computer Applications Semester—I

Sr. No.	Course Category	Course Name	Course Code	Teaching Scheme (hrs.)			Total Credits	% weightage			ESE Duration (hrs.)	TOTAL
				L	T	P		CT	CA	ESE		
1.	DSC	Mathematics Foundations to Computer Science – I	BCA11101	3	-	-	3	30	10	60	3	100
2.	SEC	Problem Solving Techniques	BCA11102	3	-	-	3	30	10	60	3	100
3.	SEC	Problem Solving Techniques Lab	BCA11103	-	-	4	2	-	25	25	2	50
4.	DSC	Computer Architecture	BCA11104	3	-	-	3	30	10	60	3	100
5.	DSC	Computer Architecture Lab	BCA11105	-	-	4	2	-	25	25	2	50
6.	MDE	Indian Science and Technology (Past, Present and Future)	BCA11106	2	-	-	2	14	6	30	2	50
7.	VAC	Environmental Science and Sustainability	BBA11105	2	-	-	2	14	6	30	2	50
8.	AEC	Digital Wellness & Basic Communication Lab	BSH41104	-	-	4	2	-	25	25	2	50
9.	AEC	Liberal Learning Courses I - Lab	BSH41X01	-	-	4	2	-	25	25	2	50
				13	0	12	21	118	142	340	21	600

Course Category	DSC	SEC	AEC	MDE	VAC
Credits	8	5	4	2	2
Cumulative Summary	8	5	4	2	2

TOTAL CREDITS: 21

				17/05/2025	1.0
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Programme: Bachelor of Computer Applications First Year Bachelor of Computer Applications Semester—II

Sr. No.	Course category	Course Name	Course Code	Teaching Scheme (hrs.)			Total credits	% weightage			ESE Duration (hrs.)	TOTAL
				L	T	P		CT	CA	ESE		
1	DSC	Mathematics Foundations to Computer Science –II	BCA11201	3	-	-	3	30	10	60	3	100
2	DSC	Data Structures	BCA11202	3	-	-	3	30	10	60	3	100
3	DSC	Data Structures Lab	BCA11203	-	-	4	2	-	25	25	2	50
4	DSC	Operating systems	BCA11204	3	-	-	3	30	10	60	3	100
5	DSC	Operating systems Lab	BCA11205	-	-	2	1	-	25	25	2	50
6	SEC	Object Oriented Programming	BCA11206	3	-	-	3	30	10	60	3	100
7	SEC	Object Oriented Programming using Java and C++ Lab	BCA11207	-	-	4	2	-	25	25	2	50
8	SEC	Web Technologies Lab	BCA11208	-	-	2	1	-	25	25	2	50
9	VAC	Indian Constitution	BBA11206	2	-	-	2	14	06	30	2	50
10	AEC	Liberal Learning Courses II - Lab	BSH41Y01	-	-	4	2	-	25	25	2	50
				14	0	16	22	120	190	390	24	700

Course Category	DSC	SEC	AEC	MDE	VAC
Credits	12	6	2	0	2
Cumulative Summary	20	11	6	2	4

PROGRESSIVE TOTAL CREDITS: 21+22=43

				17/05/2025	1.0
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After year 1, students are advised to take social responsibility & community engagement encompassing community engagement with an NGO in the vacation time.

An UNDER GRADUATE CERTIFICATE IN COMPUTER APPLICATION will be awarded if a student wishes to exit at the end of First year.

Exit Criteria after First Year of BCA Programme

Students will have the option to exit the Bachelor of Computer Applications (BCA) program after successfully completing the first year. Upon exit, they will be awarded a UG Certificate in Computer Applications. To be eligible for this certificate, students must complete an additional 4 credits in one of the following areas:

1. **Skill-Based Subject:** A course designed to enhance practical and technical skills in the field of computer applications.
2. **Work-Based Vocational Course:** A vocational course offered during the summer term that emphasizes hands-on training and workplace readiness.
3. **Internship/Apprenticeship:** A professional internship or apprenticeship program in a relevant field, with a minimum duration of 08 weeks, which will take place after the second semester.
4. **Social Responsibility & Community Engagement:** Active engagement with an NGO or community organization for a minimum duration of 08 weeks, focusing on real-world problem-solving, social responsibility, and community service.

The respective university or admitting body will determine the mode and specifics of these additional credits, and students will be required to complete the 8 week's program during the summer term following their second semester.

The exiting students will clear the subject/ submit the Internship Report as per the University schedule.

Re-entry Criteria in to Second Year (Third Semester)

The student who takes an exit after one year with an award of certificate may be allowed to re-enter in to third semester for completion of the BCA program as per the respective university or admitting body schedule after earning requisite credits in the first year.



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Programme: Bachelor of Computer Applications Second Year Bachelor of Computer Applications Semester—III

Sr. No.	Course category	Course Name	Course Code	Teaching Scheme (hrs.)		Total credits	% weightage			ESE Duration (hrs.)	TOTAL
				L	P		CT	CA	ESE		
1	DSC	Probability and Statistics	BCA12301	3	-	3	30	10	60	3	100
2	DSC	Data Base Management System	BCA12302	3	-	3	30	10	60	3	100
3	DSC	Data Base Management System Lab	BCA12303	-	4	2	-	25	25	2	50
4	SEC	Python Programming	BCA12304	3	-	3	30	10	60	3	100
5	SEC	Python Programming Lab	BCA12305	-	4	2	-	25	25	2	50
6	SEC	Software Engineering	BCA12306	3	-	3	30	10	60	3	100
7	DSE	Professional Elective – I	BCA123XX	2	-	2	14	6	30	2	50
7	DSE	Professional Elective – I Lab	BCA123XX	-	4	2	-	25	25	2	50
				12	16	20	120	140	340	20	600

Course Category	DSC	SEC	AEC	MDE	VAC	DSE
Credits	8	8	0	0	0	4
Cumulative Summary	28	19	6	2	4	4

PROGRESSIVE TOTAL CREDITS: 43+20=63

* To be selected from the Discipline-Specific Electives - Data Science / Artificial Intelligence and Machine Learning as indicated in the **Appendix - A**

				17/05/2025	1.0
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Programme: Bachelor of Computer Applications Second Year Bachelor of Computer Applications Semester—IV

Sr. No.	Course category	Course Name	Course Code	Teaching Scheme (hrs.)			Total credits	% weightage			ESE Duration (hrs.)	TOTAL
				L	T	P		CT	CA	ESE		
1	DSC	Entrepreneurship and Startup Ecosystem	BCA12401	2	1	-	3	30	10	60	3	100
2	DSC	Computer Networks	BCA12402	3	-	-	3	30	10	60	3	100
3	DSC	Computer Networks Lab	BCA12403	-	-	4	2	-	25	25	2	50
4	DSC	Design and Analysis of Algorithm	BCA12404	3	-	-	3	30	10	60	3	100
5	DSC	Artificial Intelligence	BCA12405	3	-	-	3	30	10	60	3	100
6	DSC	Artificial Intelligence Lab	BCA12406	-	-	4	2	-	25	25	2	50
7	DSE*	Professional Elective – II	BCA124XX	-	-	4	2	-	25	25	2	50
8	SEC	Design Thinking and Innovation	BCA12408	1	1	-	2	14	6	30	2	50
				12	2	12	20	134	121	345	20	600

Course Category	DSC	SEC	AEC	MDE	VAC	DSE
Credits	16	2	0	0	0	2
Cumulative Summary	44	21	6	2	4	6

PROGRESSIVE TOTAL CREDITS: 63+20=83

				17/05/2025	1.0
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Students can choose their specialization i.e. stream with Discipline Specific Elective (DSE) from Third year onwards as indicated in Appendix –I.

Exit Criteria after Second Year of BCA Programme

Students will have the option to exit the Bachelor of Computer Applications (BCA) program after successfully completing the second year. Upon exit, they will be awarded a UG Diploma in Computer Application. To be eligible for this diploma, students must complete an additional 04 credits in one of the following areas:

1. **Skill-Based Subject:** A specialized course aimed at enhancing technical and practical expertise in computer applications.
2. **Work-Based Vocational Course:** A vocational course offered during the summer term, focused on building practical, industry-relevant skills.
3. **Internship/ Apprenticeship:** A professional internship or apprenticeship with a minimum duration of 8 weeks, conducted after the fourth semester, offering hands-on experience in a relevant field.
4. **Social Responsibility & Community Engagement:** Involvement with an NGO or community-based organization for a minimum of 8 weeks, contributing to social initiatives and applying computer application knowledge to solve real-world challenges.
5. **Capstone Project:** Completion of a capstone project integrating the skills and knowledge gained during the first two years of the program, which can be an independent or group project.

The respective university or admitting body will decide the specific mode of completing the additional credits, and students will be required to complete the 8 week's program or project during the summer term following their fourth semester.

Students opting for this exit will also be required to submit an internship or apprenticeship report or complete the capstone project as per the schedule outlined by the university or admitting body before they are awarded the UG Diploma.

Re-entry Criteria into Third Year (Fifth Semester)

The student who takes an exit after second year with an award of Diploma may be allowed to re-enter into fifth Semester for completion of the BCA program as per the respective university or admitting body schedule after earning requisite credits in the second year.



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Programme: Bachelor of Computer Applications Third Year Bachelor of Computer Applications Semester—V

Sr. No.	Course category	Course Name	Course Code	Teaching Scheme (hrs.)			Total credits	% weightage			ESE Duration (hrs.)	TOTAL
				L	T	P		CT	CA	ESE		
1	DSE*	Professional Elective – III	BCA135XX	3	-	-	3	30	10	60	3	100
2	DSE*	Professional Elective – III Lab	BCA135XX	-	-	4	2	-	25	25	2	50
3	DSE*	Professional Elective – IV	BCA135XX	3	-	-	3	30	10	60	3	100
4	DSE*	Professional Elective – IV Lab	BCA135XX	-	-	4	2	-	25	25	2	50
5	DSE*	Professional Elective – V	BCA135XX	3	-	-	3	30	10	60	3	100
6	DSE*	Professional Elective – V Lab	BCA135XX	-	-	4	2	-	25	25	2	50
7	SEC	Quantitative Techniques	BCA13513	-	2	-	2	14	6	30	2	50
8	SEC	Internship / Capstone Project Phase – I	BCA13514	-	-	8	4	-	100	100	8	200
				9	2	20	21	104	211	385	25	700

Course Category	DSC	SEC	AEC	MDE	VAC	DSE
Credits	15	6	0	0	0	0
Cumulative Summary	59	27	6	2	4	6

PROGRESSIVE TOTAL CREDITS: 83+21=104

				17/05/2025	1.0
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Programme: Bachelor of Computer Applications Scheme of Instructions: Third Year Bachelor of Computer Applications Semester—VI

Sr. No.	Course category	Course Name	Course Code	Teaching Scheme (hrs.)			Total credits	% weightage			ESE Duration (hrs.)	TOTAL
				L	T	P		CT	CA	ESE		
1	DSC	Generative AI	BCA13601	3	-	-	3	30	10	60	3	100
2	DSC	Generative AI (Lab)	BCA13602	-	-	4	2	-	25	25	2	50
3	DSE*	Professional Elective – VI	BCA136XX	3	-	-	3	30	10	60	3	100
4	DSE*	Professional Elective – VI (Lab)	BCA136XX	-	-	4	2	-	25	25	2	50
5	DSE*	Professional Elective – VII	BCA136XX	3	-	-	3	30	10	60	3	100
6	DSE*	Professional Elective – VII (Lab)	BCA136XX	-	-	4	2	-	25	25	2	50
7	AEC	Soft Skills	BCA13611	-	1	-	1	-	25	-	1	25
8	SEC	Internship / Capstone Project Phase – II	BCA13612	-	-	8	4	-	100	100	8	200
				9	1	20	20	90	230	355	24	675

Course Category	DSC	SEC	AEC	MDE	VAC	DSE
Credits	5	4	1	0	0	10
Cumulative Summary	64	31	7	2	4	16

PROGRESSIVE TOTAL CREDITS: 104+20=124

				17/05/2025	1.0
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BACHELOR OF COMPUTER APPLICATIONS Degree will be awarded, if a student wishes to exit at the end of Third year.

Exit Criteria after Third Year of BCA Programme

The students shall have an option to exit after 3rd year of Computer Application Program and will be awarded with a Bachelor of Computer Applications (BCA).

Re-entry Criteria into Fourth Year (Seventh Semester)

The student who takes an exit after third year with an award of BCA may be allowed to re-enter in to Seventh Semester for completion of the BCA (Honours) or BCA (Honours with Research) Program as per the respective university or admitting body schedule after earning requisite credits in the Third year.

Minimum Eligibility Criteria: Minimum eligibility criteria for opting the course in the fourth year will be as follows:

- 1. BCA (Honours with Research):** Minimum 75% marks or equivalent CGPA in BCA Degree up to 6th Semester.
- 2. For BCA (Honours):** BCA Degree



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BCA Semester—VII (Honours) Specialization (Artificial and Machine Learning)

Sr. No.	Course category	Course Name	Course Code	Teaching Scheme (hrs.)		Total credits	% weightage			ESE Duration (hrs.)	TOTAL
				L	P		CT	CA	ESE		
1	MDE	Social Network Analysis	BCA14701	3	-	3	30	10	60	3	100
2	DSC	Machine Learning	BCA14702	3	-	3	30	10	60	3	100
3	DSC	Machine Learning (Lab)	BCA14703	-	4	2	-	25	25	2	50
4	DSE*	Professional Elective-VIII	BCA147XX	3	-	3	30	10	60	3	100
5	DSE*	Professional Elective-VIII (Lab)	BCA147XX	-	4	2	-	25	25	2	50
6	DSE*	Professional Elective-IX	BCA147XX	3	-	3	30	10	60	3	100
7	SEC	Internship / Project Work – I	BCA14710	-	8	4	-	100	100	8	200
				12	16	20	120	190	390	24	700

Course Category	DSC	SEC	AEC	MDE	VAC	DSE
Credits	5	4	0	3	0	8
Cumulative Summary	69	35	7	5	4	24

PROGRESSIVE TOTAL CREDITS: 124+20=144

				17/05/2025	1.0
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BCA Semester—VII (Honours) Specialization (Data Science)

Sr. No.	Course category	Course Name	Course Code	Teaching Scheme (hrs.)		Total credits	% weightage			ESE Duration (hrs.)	TOTAL
				L	P		CT	CA	ESE		
1	MDE	Advanced Statistical Methods for Data Science	BCA14709	3	-	3	30	10	60	3	100
2	DSC	Python for Data Science	BCA14710	3	-	3	30	10	60	3	100
3	DSC	Python for Data Science (Lab)	BCA14711	-	4	2	-	25	25	2	50
4	DSE*	Professional Elective – VIII	BCA147XX	3	-	3	30	10	60	3	100
5	DSE*	Professional Elective – VIII (Lab)	BCA147XX	-	4	2	-	25	25	2	50
6	DSE*	Professional Elective – IX	BCA147XX	3	-	3	30	10	60	3	100
7	SEC	Internship / Project Work – I	BCA14707	-	8	4	-	100	100	8	200
				12	16	20	120	190	390	24	700

Course Category	DSC	SEC	AEC	MDE	VAC	DSE
Credits	5	4	0	3	0	8
Cumulative Summary	69	35	7	5	4	24

PROGRESSIVE TOTAL CREDITS: 124+20=144

				17/05/2025	1.0
Chairman	Dean	Vice Principal	Principal	Date of BoS	Version



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BCA Semester—VIII (Honours) Specialization (Artificial Intelligence and Machine Learning) and (Data Science)

Sr. No.	Course category	Course Name	Course Code	Teaching Scheme (hrs.)		Total credits	% weightage			ESE Duration (hrs.)	TOTAL
				L	P		CT	CA	ESE		
1	DSE*	Professional Elective – X	BCA148XX	3	-	3	30	10	60	3	100
2	DSE*	Professional Elective – X (Lab)	BCA148XX	-	4	2	-	25	25	2	50
3	DSE*	Professional Elective – XI	BCA148XX	3	-	3	30	10	60	3	100
4	DSE*	Professional Elective – XI (Lab)	BCA148XX	-	4	2	-	25	25	2	50
5	DSE*	Professional Elective – XII	BCA148XX	2	-	2	14	6	30	2	50
7	SEC	Internship / Project Work – II	BCA14808	-	16	8	-	100	100	16	200
				8	24	20	74	176	300	28	550

Course Category	DSC	SEC	AEC	MDE	VAC	DSE
Credits	0	8	0	0	0	12
Cumulative Summary	69	43	7	5	4	36

*L-T-P w.r.t Open Elective and Discipline Specific Elective depends on the Courses offered by the University

PROGRESSIVE TOTAL CREDITS: 144+20=164

				17/05/2025	1.0
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BCA Semester—VII (Honours with Research)

Sr. No.	Course category	Course Name	Course Code	Teaching Scheme (hrs.)			Total credits	% weightage			ESE Duration (hrs.)	TOTAL
				T	Tu	P		CT	CA	ESE		
1	DSC	Advanced Data Analysis	BCA14715	-	2	-	2	14	6	30	2	50
2	DSC	Advanced Data Analysis (Lab)	BCA14716	-	-	4	2	-	25	25	2	50
3	DSC	Research Methodology	BCA14717	2	2	-	4	30	10	60	3	100
4	DSC	Research Internship Report and Viva-voce	BCA14718	-	-	8	4	-	50	50	3	100
5	DSE	Professional Elective – IX	BCA147XX	2	2	-	4	30	10	60	3	100
6	DSE	Professional Elective – X	BCA147XX	2	-	-	2	30	10	60	3	100
7	DSE	Professional Elective – X (Lab)	BCA147XX	-	-	4	2	-	25	25	2	50
				6	6	16	20	104	136	310	18	550

Course Category	DSC	SEC	AEC	MDE	VAC	DSE
Credits	12	0	0	0	0	8
Cumulative Summary	76	31	7	2	4	24

PROGRESSIVE TOTAL CREDITS: 124+20=144

				17/05/2025	1.0
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BCA Semester—VIII (Honours with Research)

Sr. No.	Course category	Course Name	Course Code	Teaching Scheme (hrs.)		Total credits	% weightage			ESE Duration (hrs.)	TOTAL
				T	P		CT	CA	ESE		
1	SEC	Internship / Project Work – II	BCA14811	-	-	20	-	-	500	3	500
				-	-	20	-	-	500	3	500

Course Category	DSC	SEC	AEC	MDE	VAC	DSE
Credits	0	20	0	0	0	0
Cumulative Summary	76	51	7	2	4	24

PROGRESSIVE TOTAL CREDITS: 144+20=164

* The Dissertation work will start from the beginning of fourth year of BCA (Honours with Research) Program.

Students of Fourth Year shall be assessed for Project Work and Research Internship Report and Viva

–Voce and Dissertation (For Research Track)

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Appendix-A Discipline-Specific Electives (DSE)

1. Data Science

S. No.	Semester	Professional Elective	Course Code	Professional Elective
1.	III	I	BCA123XX	Basics of Data Analytics using Spreadsheet (Lab)
2.	IV	II	BCA124XX	Data Visualization (Lab)
3.	V	III	BCA135XX	Introduction to Data Science
4.	V	III	BCA135XX	Introduction to Data Science (Lab)
5.	V	IV	BCA135XX	Time Series Analysis
6.	V	IV	BCA135XX	Time Series Analysis (Lab)
7.	V	V	BCA135XX	Machine Learning
8.	V	V	BCA135XX	Machine Learning (Lab)
9.	VI	VI	BCA136XX	Big Data Analysis
10.	VI	VI	BCA136XX	Big Data Analysis (Lab)
11.	VI	VII	BCA136XX	Exploratory Data Analysis
12.	VI	VII	BCA136XX	Exploratory Data Analysis (Lab)
13.	VII	VIII	BCA147XX	Business Intelligence & Analytics
14.	VII	VIII	BCA147XX	Business Intelligence & Analytics(lab)
15.	VII	IX	BCA147XX	Data Mining & Warehousing
16.	VIII	X	BCA148XX	Advanced Data Visualization
17.	VIII	X	BCA148XX	Advanced Data Visualization (Lab)
18.	VIII	XI	BCA148XX	Cloud Computing for Data Analytics
19.	VIII	XI	BCA148XX	Cloud Computing for Data Analytics (Lab)
20.	VIII	XII	BCA148XX	Data Security & Privacy

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2. Artificial Intelligence & Machine Learning

S. No.	Semester	Professional Elective	Course Code	Professional Elective
1.	III	I	BCA123XX	Feature Engineering
2.	IV	II	BCA124XX	Introduction to Machine Learning
3.	V	III	BCA135XX	Neural Network
4.	V	III	BCA135XX	Neural Network (Lab)
5.	V	IV	BCA135XX	Digital Image Processing
6.	V	IV	BCA135XX	Digital Image Processing (Lab)
7.	V	V	BCA135XX	Natural Language Processing
8.	V	V	BCA135XX	Natural Language Processing (Lab)
9.	VI	VI	BCA136XX	Deep Learning for Computer Vision
10.	VI	VI	BCA136XX	Deep Learning for Computer Vision (Lab)
11.	VI	VII	BCA136XX	Predictive Analysis
12.	VI	VII	BCA136XX	Predictive Analysis (Lab)
13.	VII	VIII	BCA147XX	Explainable AI
14.	VII	VIII	BCA147XX	Explainable AI (Lab)
15.	VII	IX	BCA147XX	Evolutionary Algorithm
16.	VIII	X	BCA148XX	Speech Recognition
17.	VIII	X	BCA148XX	Speech Recognition (Lab)
18.	VIII	XI	BCA148XX	Augmented Reality & Virtual Reality
19.	VIII	XI	BCA148XX	Augmented Reality & Virtual Reality (Lab)
20.	VIII	XII	BCA148XX	Security aspects of Machine Learning

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Annexure-I

Liberal Learning Courses for SEM – I

SN	Sem	Type	BoS / Dept.	Sub. Code	Subject	T/P	Contact Hours			Credits	Weightage	
							L	P	Hrs		INT (1-Certificate)	ESE (MCQ)
1	1	AEC	S&H	BSH41X01	Art of Theater & Music	P	2	2	4	2	25	25
2	1	AEC	S&H	BSH41X02	CPD (Communication for Personality Development)	P	2	2	4	2	25	25
3	1	AEC	S&H	BSH41X03	EBCD (Every Body Can Dance)	P	2	2	4	2	25	25
4	1	AEC	S&H	BSH41X04	Yoga Practices	P	2	2	4	2	25	25
5	1	AEC	S&H	BSH41X05	Functional English (Level-1)	P	2	2	4	2	25	25
6	1	AEC	S&H	BSH41X06	Gateway to Competitive Exams (Level-1)	P	2	2	4	2	25	25
7	1	AEC	S&H	BSH41X07	Smart Trading & Marketing (Level-1)	P	2	2	4	2	25	25
8	1	AEC	S&H	BSH41X08	Foreign Language - French (Level-1)	P	2	2	4	2	25	25
9	1	AEC	S&H	BSH41X09	Foreign Language – German (Level-1)	P	2	2	4	2	25	25
10	1	AEC	S&H	BSH41X10	Foreign Language – Japanese (Level-1)	P	2	2	4	2	25	25

Liberal Learning Courses for SEM – II

SN	Sem	Type	BoS / Dept.	Sub. Code	Subject	T/P	Contact Hours			Credits	Weightage	
							L	P	Hrs		INT (1-Certificate)	ESE (MCQ)
1	1	AEC	S&H	BSH41Y01	Art, Craft & Poster	P	2	2	4	2	25	25
2	1	AEC	S&H	BSH41Y02	IPD (Integration of Personality Development)	P	2	2	4	2	25	25
3	1	AEC	S&H	BSH41Y03	Sports (Outdoor & Indoor)	P	2	2	4	2	25	25
4	1	AEC	S&H	BSH41Y04	Indian Traditional Cuisine	P	2	2	4	2	25	25
5	1	AEC	S&H	BSH41Y05	Functional English (Level-2)	P	2	2	4	2	25	25
6	1	AEC	S&H	BSH41Y06	Gateway to Competitive Exams (Level-2)	P	2	2	4	2	25	25
7	1	AEC	S&H	BSH41Y07	Smart Trading & Marketing (Level-2)	P	2	2	4	2	25	25
8	1	AEC	S&H	BSH41Y08	Foreign Language - French (Level-2)	P	2	2	4	2	25	25
9	1	AEC	S&H	BSH41Y09	Foreign Language – German (Level- 2)	P	2	2	4	2	25	25
10	1	AEC	S&H	BSH41Y10	Foreign Language – Japanese (Level- 2)	P	2	2	4	2	25	25