SHRI GURU RAM RAI UNIVERSITY

[Estd. by Govt. of Uttarakhand, vide Shri Guru Ram Rai University Act no. 03 of 2017 & recognized by UGC u/s (2f) of UGC Act 1956]

SYLLABUS
FOR

Certificate in Computer Applications – 1 Year

Diploma in Computer Applications – 2 Years

Bachelor in Computer Applications – 3 Years

Bachelor in Computer Applications (Honours with Research/ Academic

Project/ Entrepreneurship) – 4 Years

As per NEP 2020

School of Computer Application &

Information Technology

(w.e.f. 2023-2024)

Ordnance of Bachelor in Computer Application

Bachelor of Computer Application is an undergraduate degree programmes of either 3 or 4-year duration, with multiple entry and exit points and re-entry options, with appropriate certifications such as:

S.No.	Name of Program	Duration of the program	Remarks
1	**Certificate in Computer Application** after completing 1 year (2 semesters) of study	1 Year	Students who opt to exit after completion of the first year and have secured **44 credits** will be awarded a UG certificate if, in addition, they complete one vocational course/Internship of **4 credits** during the summer vacation of the first year. These students are allowed to re-enter the degree programme within three years and complete the degree programme within the stipulated maximum period of seven years
2	**Diploma in Computer Application** after 2 years (4 semesters) of study	2 Years	Students who opt to exit after completion of the second year and have secured **88 credits** will be awarded the UG diploma if, in addition, they complete one vocational course/Internship of **4 credits** during the summer vacation of the second year. These students are allowed to re-enter within a period of three years and complete the degree programme within the maximum period of seven years.
3	**Bachelor in Computer Application** after 3-year (6 semesters) programme of study	3 Years	Students who wish to undergo a 3-year UG programme will be awarded UG Degree, Bachelor in Computer Application in the Major discipline after successful completion of three years, securing **132 credits**.
4	**Bachelor in in Computer Application (Honours with Research/ Academic Project/ Entrepreneurship)** after 4 years (8 semester) programme of study	4 Years	A four-year UG Honours degree **(Bachelor in Computer Application (Honours) with Machine Learning)** in the major discipline will be awarded to those who complete a four-year degree programme with **176 credits**. **Students who secure 75% marks and above in the first six semesters can opt for the Honours in Research.**

Eligibility for admission:

Intermediate (Class XII) in any discipline with minimum 45% marks and Maths as compulsory subject at 10+2.

Duration of the Programme: 3/4 years

Examination Scheme:

	Internal Assessment		External Assessment (ESE)
Components	**Internal Exam**	**Assignment & Teacher Assessment**	
Weightage (%)	**15**	**15**	**70**

Programme outcome (POs)

Students will be able to

PO1	Ability to demonstrate knowledge of Computer science and its applications in order to enhance basic understanding of various software technologies.
PO2	Ability to analyze and identify various business and technical problems to further solve problems with effective communication.
PO3	Ability to adapt analytical, logical and managerial skills with the technical aspects in order to design and deploy reliable software programs and application for real world problems
PO4	Ability to investigate complex problems and provide computer-based solutions.
PO5	Ability to understand and deliver ethical, social and cultural responsibilities in professional environment as an individual and team.
PO6	Ability to adapt new technologies for upgrading their skills and contributing to a life long learning.
PO7	Ability to create and manage multidisciplinary projects and successfully apply software and project management principles.
PO8	Ability to become employable in a variety of IT companies and government sector and also seek entrepreneurship opportunities for the betterment of an individual and society at large.
PO9	An ability to design and implement database solutions using available technologies.
PO10	Acquired skills and to recognize the need for life-long learning for continuing professional development.
PO11	Excellent verbal communication skills with capability to work in multidisciplinary teams with positive attitude
PO12	An ability to work effectively as an individual as well as a member of a team and provide technical and visionary leadership to others.

Basic Structure of CCA, DCA, BCA (Honors) and BCA (Honours with Research or Honours with Academic Project/Entrepreneurship)

Basic Structure of UG Single Core Discipline Program –

Type of Course

Discipline Specific Core (DSC)

Discipline Specific Elective (DSE)

General Elective (GE)

Ability Enhancement Courses (AEC)

Skill Enhancement Course (SEC)

Internship/Apprenticeship / Project/ Community Outreach (IAPC)

Value Addition course (VAC)

Sem	Core - Discipline Specific Core (DSC)	Elective-Discipline Specific Elective (DSE)	Elective-Generic Elective (GE)	Ability Enhancement Course (AEC)	Skill Enhancement Course (SEC)	(Internship/ Apprenticeship / Project/ Community Outreach) (IAPC)	Value Addition Course (VAC)	Total Credits
	Course/credit distribution (Credits 4) Theory or Theory + Practicum (3T+1L)	Course/ credit distribution (Credits 4) Theory or Theory + Practicum/ Lab (3T+1L or 2T+2L)	Course/ credit distribution (Credits 4) Theory or Theory + Practicum/ Lab (Credits 4T or 3T+1L or 2T+2L)	Course/ credit distribution (Credits 2)	Course/credit distribution (Credits 2)	Course/ credit distribution (Credits 2)	Course/ credit distribution (Credits 2)	
I	**DSC 1- (4) DSC 2- (4) DSC 3- (4)** (3T+1L)		Choose one from a pool of courses **GE – 1 (4)**	**AEC – 1 (2)**	Choose one from a pool of courses **SEC – 1 (2)**		Choose one from a pool of courses **VAC – 1 (2)**	22
II	**DSC 4- (4) DSC 5- (4) DSC 6- (4)** (3T+1L)		Choose one from a pool of courses **GE – 2 (4)**	**AEC – 2 (2)**	Choose one from a pool of courses **SEC – 2 (2)**		Choose one from a pool of courses **VAC – 2 (2)**	22
	Students on exit shall be awarded Undergraduate Certificate (in the field of study/Discipline) after securing requisite 44 credits in semester I & II							*Total credits = 44*
III	**DSC 7- (4) DSC 8- (4) DSC 9- (4)** (3T+1L)	Choose one from a pool of courses, **DSE 1 (4)** OR **GE - 3 (4)** (4 T/or 3T+1L/or 2T+2L) OR **MOOC**		**AEC – 3 (2)**	Choose one from **SEC 3 – (2)** OR **Internship/Apprenticeship / Project/ Community Outreach (IAPC) – (2)**		Choose one from a pool of courses **VAC – 3 (2)**	22

IV	DSC 10- (4) DSC 11- (4) DSC 12- (4) (3T+1L)	Choose one from a pool of courses, **DSE 2 (4)** credits) OR **GE - 4 (4)** (4 T/or 3T+1L/or 2T+2L) OR **MOOC**	**AEC – 4 (2)**	Choose one from **SEC 4 – (2)** OR **Internship/Apprenticeship /** **Project/ Community** **Outreach** **(IAPC) – (2)**	Choose one from a pool of courses **VAC – 4 (2)**	22
Students on exit shall be awarded Undergraduate Diploma (in the field of study/Discipline) after securing requisite 88 credits in semester III & IV						**Total credits= 88**
V	**DSC 13- (4)** **DSC 14- (4)** **DSC 15- (4)** (3T+1L)	Choose one from a pool of courses, **DSE 3 (4)** credits) (3T+1L/or 2T+2L) OR **MOOC**	Choose one from a pool of courses **GE – 5 (4)** OR **MOOC**		Choose one from **SEC 5 – (2)** OR **Internship/Apprenticeship /** **Project/ Community** **Outreach** **(IAPC) – (2)**		22
VI	**DSC 16- (4)** **DSC 17- (4)** **DSC 18- (4)** (3T+1L)	Choose one from a pool of courses, **DSE 4 (4)** credits) (3T+1L/or 2T+2L) OR **MOOC (4)**	Choose one from a pool of courses **GE – 6 (4)** **OR** **MOOC**		Choose one from **SEC 5 – (2)** OR **Internship/Apprenticeship /** **Project/ Community** **Outreach** **(IAPC) – (2)**		22
Students on exit shall be awarded Bachelor of (in the field of study) Honours (Discipline) after securing requisite 132 credits on completion of semester VI						**Total credits= 132**
VII	**DSC 19 (4)** (3T+1L)	**Choose 3 DSE** (3x4) courses OR **Choose 2 DSE – (2x4) and one GE (4)** course OR **Choose 1 DSE (4) and 2 GE** (2x4) courses **(Total= 12)**			Dissertation on Major/Minor (4+2) OR Academic Project/ Entrepreneurship **(4+2)**		22
VIII	**DSC 20 (4)** (3T+1L)	**Choose 3 DSE** (3x4) courses OR **Choose 2 DSE – (2x4) and one GE (4)** course OR **Choose 1 DSE (4) and 2 GE** (2x4) courses **(Total= 12)**			Dissertation on Major/Minor (4+2) OR Academic Project/ Entrepreneurship **(4+2)**		22
Students on exit shall be awarded Bachelor of (field of study) (Honours with Research or Honours with Academic project/Entrepreneurship) Discipline after securing requisite 176 credits on completion of semester VIII						**Total credits= 176**

STUDY & EVALUATION SCHEME
Choice Based Credit System

Certificate in Computer Application (CCA)

1st Semester

S. No.	Course Category	Couse Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Sessional (Internal)	External (ESE)	
Theory										
1	Discipline Specific core	BCADSC101	Programming in 'C'	3	-	-	3	30	70	100
2	Discipline Specific core	BCADSC102	Computer Fundamental & Information Technology	3	-	-	3	30	70	100
3	Discipline Specific core	BCADSC103	Mathematical Foundation of Computer Science	4	-	-	4	30	70	100
4	Generic Elective		Select from the list of Generic Elective subjects	4	-	-	4	30	70	100
5	Skill enhancement		Select from the list of Skill enhancement subjects	2	-	-	2	30	70	100
6	Ability enhancement		Select from the list of Ability enhancement subjects	2	-	-	2	30	70	100
7	Value Addition course		Select from the list of Value Addition course subjects	2	-	-	2	30	70	100
Practical										
8	Major/Core	BCAP11	Programming in 'C' Lab	-	-	2	1	30	70	100
9	Major/Core	BCAP12	Computer Fundamental Lab	-	-	2	1	30	70	100
			Total	**20**	**-**	**4**	**22**	**270**	**630**	**900**

2nd Semester

S. No	Course Category	Couse Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Sessional (INT)	External (ESE)	
Theory										
1	Discipline Specific core	BCADSC201	Data Structure & File Organization	3	-	-	3	30	70	100
2	Discipline Specific core	BCADSC202	Core Java	3	-	-	3	30	70	100
3	Discipline Specific core	BCADSC203	Digital Electronics	3	1	-	4	30	70	100
4	Generic Elective		Select from the list of Generic Elective subjects	4	-	-	4	30	70	100
5	Skill enhancement		Select from the list of Skill enhancement subjects	2	-		2	30	70	100
6	Ability enhancement		Select from the list of Ability enhancement subjects	2	-	-	2	30	70	100
7	Value Addition course		Select from the list of Value Addition course subjects	2	-	-	2	30	70	100
Practical										
8	Core	BCAP21	Data Structure & File Organization Lab	-	-	2	1	30	70	100
9	Core	BCAP22	Core Java Lab	-	-	2	1	30	70	100
			Total	19	1	4	22	270	630	900
Exit option with **Certificate in Computer Applications** (with the completion of courses equivalent to a minimum of **44 credits**) + **4** Exit Credits				**Total Credits (Iˢᵗ & IIⁿᵈ Sem)**			44	**Total Marks (Iˢᵗ & IIⁿᵈ Sem)**		1800

Diploma in Computer Application (DCA)

[CCA & 2nd year]

3rd Semester

S. No	Course Category	Couse Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Sessional (Internal)	External (ESE)	
Theory										
1	Discipline Specific core	BCADSC301	Computer Networks	3	-	-	3	30	70	100
2	Discipline Specific core	BCADSC302	Web Programming	3	-	-	3	30	70	100
3	Discipline Specific core	BCADSC303	System Analysis & Design	3	1	-	4	30	70	100
4	Generic Elective		Select from the list of Generic Elective subjects	4	-	-	4	30	70	100
5	Skill enhancement		Select from the list of Skill enhancement subjects	2	-	-	2	30	70	100
6	Ability enhancement		Select from the list of Ability enhancement subjects	2	-	-	2	30	70	100
7	Value Addition course		Select from the list of Value Addition course subjects	2	-	-	2	30	70	100
Practical										
8	Major/ Core	BCAP31	Computer Networks Lab	-	-	2	1	30	70	100
9	Major/ Core	BCAP32	Web Programming Lab	-	-	2	1	30	70	100
			Total	**19**	**1**	**4**	**22**	**270**	**630**	**900**

4th Semester

S. No.	Course Category	Couse Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Sessional (Internal)	External (ESE)	
Theory										
1	Discipline Specific core	BCADSC401	Database Management System	3	-	-	3	30	70	100
2	Discipline Specific core	BCADSC402	Operating System	3	-	-	3	30	70	100
3	Discipline Specific core	BCADSC403	Software Engineering	3	1	-	4	30	70	100
4	Generic Elective		Select from the list of Generic Elective subjects	4	-	-	4	30	70	100
5	Skill enhancement		Select from the list of Skill enhancement subjects	2	-	-	2	30	70	100
6	Ability enhancement		Select from the list of Ability enhancement subjects	2	-	-	2	30	70	100
7	Value Addition course		Select from the list of Value Addition course subjects	2	-	-	2	30	70	100
Practical										
8	Major/Core	BCAP41	Database Management Systems Lab	-	-	2	1	30	70	100
9	Major/Core	BCAP42	UNIX Lab	-	-	2	1	30	70	100
			Total	**19**	**1**	**4**	**22**	**270**	**630**	**900**
Exit option with **Diploma in Computer Applications** (with the completion of courses equivalent to a minimum of 88 credits) + 4 Exit Credits				**Total Credits (Ist to IVth Sem)**			**88**	**Total Marks (Ist to IVth Sem)**		**3600**

Bachelor in Computer Application (BCA)

[DCA & 3ʳᵈ year]

5ᵗʰ Semester

S. No.	Course Category	Couse Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Sessional (Internal)	External (ESE)	
Theory										
1	Discipline Specific core	BCADSC501	Python Programming	3	-	-	3	30	70	100
2	Discipline Specific core	BCADSC502	PHP Programming	3	-	-	3	30	70	100
3	Discipline Specific core	BCADSC503	Artificial Intelligence	3	1	-	4	30	70	100
4	Discipline Specific Elective	BCADSE504A	Statistics/ MOOC	4	0	-	4	30	70	100
		BCADSE504B	Operations Research/ MOOC							
5	Generic Elective		Select from the list of Generic Elective subjects	4	0	-	4	30	70	100
Practical										
6	Major/Core	BCAP51	Python Programming Lab	-	-	2	1	30	70	100
7	Major/Core	BCAP52	PHP Programming Lab	-	-	2	1	30	70	100
8	Skill Enhancement	BCASM5	Seminar	-	-	4	2	30	70	100
			Total	**17**	**1**	**8**	**22**	**270**	**560**	**800**

6th Semester

S. No.	Course Category	Couse Code	Course Name	L	T	P	C	Sessional (Internal)	External (ESE)	Subject Total
				Periods				Evaluation scheme		
Theory										
1	Discipline Specific core	BCADSC601	Advance Java Programming	3	-	-	3	30	70	100
2	Discipline Specific core	BCADSC602	Android Programming	3	-	-	3	30	70	100
3	Discipline Specific core	BCADSC603	Advance Software Engineering	3	1	-	4	30	70	100
4	Discipline Specific Elective	BCADSE604A	Introduction to IOT/ MOOC	4	-	-	4	30	70	100
		BCADSE604B	Introduction to Blockchain/ MOOC							
5	Generic Elective		Select from the list of Generic Elective subjects	4	-	-	4	30	70	100
Practical										
6	Major/Core	BCAP61	Advance Java Programming Lab	-	-	2	1	30	70	100
7	Major/Core	BCAP62	Android Programming Lab	-	-	2	1	30	70	100
8	Skill Enhancement	BCAPR6	Project	-	-	4	2	30	70	100
			Total	**17**	**1**	**8**	**22**	**240**	**560**	**800**
Exit Option with Bachelor of Computer Applications Degree, BCA Degree (with completion of courses equivalent to a minimum of 132 credits)				**Total Credits (Ist to VIth Sem)**			**132**	**Total Marks (Ist to VIth Sem)**		**5200**