

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 Information Technology – 1 Year

Diploma in Information Technology – 2 Years

Bachelor of Science in Information Technology – 3 Years

**Bachelor of Science in Information Technology (Honors with
Research/ Academic Project/ Entrepreneurship) – 4 Years**

As per NEP 2020

**School of Computer Application &
Information Technology**

(w.e.f. 2023-2024)

Ordinance of Bachelor of Science in Information Technology

Bachelor of Science in Information Technology 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 Information Technology 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 Information Technology 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 of Science in Information Technology 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 of Science in Information Technology in the Major discipline after successful completion of three years, securing 132 credits .
4	Bachelor of Science in Information Technology (Honours with Research/ Academic Project/ Entrepreneurship) after 4 years (8 semester) programme of study	4 Years	A four-year UG honors degree (Bachelor of Science in Information Technology (Honors) 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 Honors in Research.

Eligibility for admission:

Intermediate (10+2) or equivalent in any discipline from any recognized board with minimum 45%

Duration of the Programme: 3/4 years

Examination Scheme:

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

Programme outcome (POs)

Students will be able to

PO1	Computational knowledge	Acquire knowledge of Computing (algorithm and Coding) & Computing Specialization and Domain Knowledge of proper computing models for defined problems.
PO2	Problem analysis	Identify, formulate and analyze complex computational problems using mathematics, computer science concepts and relevant domains.
PO3	Design/development of solutions	Ability to design efficient solution for complex, real-life problem, system software or Application Software as per needs and specifications of customers.
PO4	Conduct investigations of complex computing problems	Use research-based knowledge and research methods including design of experiments, analysis & interpretation of data & synthesis of information to reach valid conclusions.
PO5	Modern Tool Usage	Ability to demonstrate skills to use modern technologies and tools to analyze and solve the software development problems.
PO6	Professional Ethics	Ability to perform professional practices in an ethical way, keeping in the mind cyber regulations, laws, Intellectual Property Right and norms of professional computing practices.
PO7	Life-Long Learning	Ability to develop confidence and ability for self-education and life-long learning in the broadest context of technological change. Ability to adapt or change the acquired knowledge with change in the technology.
PO8	Project management and finance	Ability to demonstrate knowledge & understanding the Software engineering management principles and apply them as a member & as a leader in a team to manage multidisciplinary projects. Ability to make budget, make estimates of time, effort, time and analyze risk and reschedule the projects accordingly.

PO9	Communication Efficacy	Ability to effectively communicate with the technical community and with the society about complex computing activities in both verbal and written form, design documents, letters, make effective presentations.
PO10	Societal and Environmental Concern	Ability to understand the impact of IT solutions in a global and societal context. Ability to apply all concepts of green computing to preserve environment and use IT resources in an effective and optimized way.
PO11	Individual and Team Work	Ability to work multi-disciplinary team both as a member and leader, as per need. To develop the leadership and managerial skills in the student.
PO12	Innovations and entrepreneurship	Ability to apply innovation and promote innovative ideas to a suitable opportunity to create value and wealth for the betterment of the individual and society at large.

**STUDY & EVALUATION SCHEME
CHOICE BASED CREDIT SYSTEM
(CBCS)**

Certificate in Information Technology

FIRST SEMESTER:

S. No.	Course Category	Course Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Internal	External	
Theory										
1	Discipline Specific Core	BITDSC101	Fundamental of Computer & Information Technology	3	-	-	3	30	70	100
2	Discipline Specific Core	BITDSC102	Programming in 'C'	3	-	-	3	30	70	100
3	Discipline Specific Core	BITDSC103	Basic Mathematics.	3	1	-	4	30	70	100
4	General Elective	BITGE101	e- Governance	3	1	-	4	30	70	100
5	Skill Enhancement Course	BITSC101	Programming Paradigm and Internet Technology	2	-	-	2	30	70	100
6	Ability Enhancement Course	AEC1	Environmental studies -1	2	-	-	2	30	70	100
7.	Value Addition Course	CITVC101	Computers and Ethics	2	-	-	2	30	70	100
Practical										
8	Discipline Specific Core	BITP11	Lab- Fundamental of Computers	-	-	2	1	30	70	100
9	Discipline Specific Core	BITP12	Lab- Programming in C	-	-	2	1	30	70	100
Total				18	2	4	22	270	630	900

**STUDY & EVALUATION SCHEME
CHOICE BASED CREDIT SYSTEM**

(CBCS)
Under Graduate Certificate in Information Technology

SECOND SEMESTER:

S. No	Course Category	Course Code	Course Name	Periods				Evaluation scheme		Subject Total	
				L	T	P	C	Internal	External		
Theory											
1	Discipline Specific Core	BITDSC201	Operating System	3	-	-	3	30	70	100	
2	Discipline Specific Core	BITDSC202	Data Structure using C	3	-	-	3	30	70	100	
3	Discipline Specific Core	BITDSC203	Digital Electronics	3	1	-	4	30	70	100	
4	General Elective	BITGE201	Cyber Security and law	3	1		4	30	70	100	
5	Skill Enhancement Course	BITSC201	Health Awareness & Hygiene	2	-	-	2	30	70	100	
6	Ability Enhancement Course	AEC2	Communication Skill: listening and speaking skills	2	-	-	2	30	70	100	
7.	Value Addition Course	CITVC201	The Art of Clean Code	2	-	-	2	30	70	100	
Practical											
8	Discipline Specific Core	BITP21	Lab-UNIX	-	-	2	1	30	70	100	
9	Discipline Specific Core	BITP22	Lab-Data Structure	-	-	2	1	30	70	100	
Total				18	2	4	22	270	630	900	
Exit option with Certificate in Information Technology (with the completion of courses) equivalent to a minimum of 44 credits + 4 credits through summer internship /Apprentice				Total Credits (I st & II nd Semester)			44	Total Marks (I st & II nd Semester)		1800	

STUDY & EVALUATION SCHEME

**CHOICE BASED CREDIT SYSTEM
(CBCS)
Diploma in Information Technology**

THIRD SEMESTER:

S. No.	Course Category	Course Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Internal	External	
Theory										
1	Discipline Specific Core	BITDSC301	DBMS	3	-	-	3	30	70	100
2	Discipline Specific Core	BITDSC302	Web Designing using HTML, CSS and Java Script	3	-	-	3	30	70	100
3	Discipline Specific Core	BITDSC303	Computer Network	3	1	-	4	30	70	100
4	General Elective	BITGE301	Digital Marketing	3	1	-	4	30	70	100
5	Skill Enhancement Course	BITSC301	Numerical Aptitude	2	-	-	2	30	70	100
6	Ability Enhancement Course	AEC3	Environmental studies -II	2	-	-	2	30	70	100
7	Value Addition Course	CITVC301	Digital Empowerment	2	-	-	2	30	70	100
Practical										
8	Discipline Specific Core	BITP31	Lab- DBMS	-	-	2	1	30	70	100
9	Discipline Specific Core	BITP32	Lab- Web Designing	-	-	2	1	30	70	100
Total				18	2	4	22	270	630	900

**STUDY & EVALUATION SCHEME
CHOICE BASED CREDIT SYSTEM**

(CBCS)
Diploma in Information Technology

FOURTH SEMESTER:

S. No.	Course Category	Course Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Sessional (Internal)	External (ESE)	
Theory										
1	Discipline Specific Core	BITDSC401	JAVA Programming	3	-	-	3	30	70	100
2	Discipline Specific Core	BITDSC402	PHP Programming	3	-	-	3	30	70	100
3	Discipline Specific Core	BITDSC403	Introduction to IoT	3	1	-	4	30	70	100
4	General Elective	BITGE401	e Commerce	3	1	-	4	30	70	100
5	Skill Enhancement Course	BITSC401	Reasoning Aptitude	2	-	-	2	30	70	100
6	Ability Enhancement Course	AEC4	Communication Skill: Reading and writing Skill	2	-	-	2	30	70	100
7	Value Addition Course	CITVC401	Challenges in Programming	2	-	-	2	30	70	100
Practical										
8	Discipline Specific Core	BITP41	Lab- JAVA Programming	-	-	2	1	30	70	100
9	Discipline Specific Core	BITP42	Lab- PHP Programming	-	-	2	1	30	70	100
Total				18	2	4	22	270	630	900
Exit option with Diploma in Information Technology (with the completion of courses) equivalent to a minimum of 8credits+ 4 credits through summer internship /Apprentice							Total Credits (Ist to IVth Semester)	88	Total Marks (Ist to IVth Semester)	3600

STUDY & EVALUATION SCHEME

**CHOICE BASED CREDIT SYSTEM
(CBCS)
B.Sc. (Information Technology) –Honors**

FIFTH SEMESTER:

S. No.	Course Category	Course Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Internal	External	
Theory										
1	Discipline Specific Core	BITDSC501	Android Programming	3	-	-	3	30	70	100
2	Discipline Specific Core	BITDSC502	Python Programming	3	-	-	3	30	70	100
3	Discipline Specific Core	BITDSC503	Statistics	3	1	-	4	30	70	100
4	General Elective	BITGE504	Enterprise Resource planning	3	1	-	4	30	70	100
5	Discipline Specific Elective	BITDSE505A	Mobile Computing/ MOOC	3	1	-	4	30	70	100
		BITDSE505B	Cloud Computing/MOOC							
		BITDSE505C	Computer Graphics/MOOC							
Practical										
6	Seminar	BITSM5	Seminar	-	-	4	2	30	70	100
7	Discipline Specific Core	BITP51	Lab- Android Programming	-	-	2	1	30	70	100
8	Discipline Specific Core	BITP52	Lab- Python Programming	-	-	2	1	30	70	100
Total				15	3	4	22	240	560	800

**STUDY & EVALUATION SCHEME
CHOICE BASED CREDIT SYSTEM
(CBCS)
B.Sc. (Information Technology)**

SIXTH SEMESTER:

S. No	Course Category	Course Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Internal	External	
Theory										
1	Discipline Specific Core	BITDSC601	C# and .NET Programming	3	-	-	3	30	70	100
2	Discipline Specific Core	BITDSC602	Software Engineering	3	1	-	4	30	70	100
3	Discipline Specific Core	BITDSC603	Big Data Analytics	3	1	-	4	30	70	100
4	General Elective	BITGE604	Management Information System	3	1	-	4	30	70	100
5	Discipline Specific Elective	BITDSE605A	Operation Research/MOOC	3	1	-	4	30	70	100
		BITDSE605B	Graph Theory/MOOC							
		BITDSE605C	Introduction to logic/MOOC							
Practical										
6	Discipline Specific Core	BITP61	Lab-C# and .NET Programming	-	-	2	1	30	70	100
6	(Internship/Apprenticeship /Project/ Community Outreach) (IAPC)	BITPR606	Project and Dissertation	-	-	4	2	30	70	100
Total				15	4	4	22	240	560	800
Exit option with Bachelor Degree in Information Technology (with the completion of courses) equivalent to a minimum of 132 credits				Total Credits (Ist to VIth Semester)			132	Total Marks Ist to VIth Semester))		5200

**STUDY & EVALUATION SCHEME
CHOICE BASED CREDIT SYSTEM
(CBCS)**

B.Sc. (IT) Honors in (Research/Entrepreneurship/ Academic Project)

SEVENTH SEMESTER:

S. No.	Course Category	Course Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Sessional (Internal)	External (ESE)	
Theory										
1	Discipline Specific Core	BITDSC701	UNIX and Shell Programming	3	-	-	3	30	70	100
2	Discipline Specific Elective	BITDSE702A	Research methodology	3	1	-	4	30	70	100
		BITDSE702B	Software Project management -I							
		BITDSE 702C	Entrepreneurship Management -I							
3	Discipline Specific Elective	BITDSE703A	Network Security and Cryptography/MOOC	3	1	-	4	30	70	100
		BITDSE703B	Multimedia system/MOOC							
4	Discipline Specific Elective	BITDSE704A	Data warehousing and Data Mining /MOOC	3	1	-	4	30	70	100
		BITDSE704B	Advance RDBMS/MOOC							
Practical										
5	Discipline Specific Elective	BITP71	LAB-UNIX	-	-	2	1	30	70	100
6	Discipline Specific Elective	BITPR705A BITPR705B BITPR705C	Dissertation on Research /Academic /Entrepreneurship Based Project	-	-	12	6	30	70	100
Total				12	3	16	22	180	420	600

**STUDY & EVALUATION SCHEME
CHOICE BASED CREDIT SYSTEM
(CBCS)**

B.Sc. (IT) Honors in (Research/Entrepreneurship/ Academic Project)

EIGHTH SEMESTER:

S. No.	Course Category	Course Code	Course Name	Periods				Evaluation scheme		Subject Total
				L	T	P	C	Sessional (Internal)	External (ESE)	
Theory										
1	Discipline Specific Core	BITDSC801	ASP.NET Programming	3		-	3	30	70	100
2	Discipline Specific Elective	BITDSE802A	Research Publication Ethics	3	1	-	4	30	70	100
		BITDSE802B	Software Project management -II							
		BITDSE802C	Entrepreneurship Management-II							
3	Discipline Specific Elective	BITDSE803A	Artificial Intelligence /MOOC	3	1	-	4	30	70	100
		BITDSE803B	Analysis and Design of Algorithm/MOOC							
4	Discipline Specific Elective	BITDSE804A	Machine Learning/MOOC	3	1	-	4	30	70	100
		BITDSE804B	Advance Software Engineering/MOOC							
PRACTICAL										
5	Discipline Specific Elective	BITP81	ASP.NET LAB	-	-	2	1	30	70	100
6	Project	BITPR805A BITPR805B BITPR805C	Dissertation on Research/Academic /Entrepreneurship Based Project	-	-	12	6	30	70	100
Total				12	3	12	22	180	420	600
UG Honors Degree (with research /Academic project/Entrepreneurship) in Information Technology (with the completion of courses) equivalent to a minimum of 176credits				Total Credits (Ist to VIIIth Semester)			176	Total Marks (Ist to VIIIth Semester)		6300