Panipat Institute of Engineering & Technology

An Autonomous Institution, Approved by A.I.C.T & Affiliated to Kurukshetra University, Kurukshetra
NBA Accredited (MBA,CSE,IT & ECE,UG) 70, MILESTONE, G.T.ROAD, SAMALKHA, PANIPAT-132103, HARYANA
Phone No. – 0180-2569700 Fax: 0180-2569800 Email: info@piet.co.in Web: www.piet.co.in

Scheme of Studies and Examinations, and the Syllabi

for

Under Graduate Degree Programme

Bachelor of Computer Applications
(Cloud Technology and Information Security)

(in phased manner)

as per NEP-2020 guidelines

With Multiple Entry-Exit and Internship
w.e.f. Academic Session 2024-25

DEPARTMENT OF COMPUTER APPLICATIONS – UG

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)										
Bachelor of Computer Applications (CTIS) Semester – I										
Course Code	**Course Title**	**Period(s)**			**Hours/ Week**	**Credit(s)**	**Continuous Internal Examination**	**Semester End Examination**	**Total Marks**	**Duration of Exam (Hours)**
							(CIE)	(SEE)	(CIE+SEE)	
		L	T	P			Max	Max	Max	
Core Course (CC)										
BCA-101A	Foundations of Computer Science	3	0	0	3	3	40	60	100	3
BCA-103A	Digital Logic Design	3	0	0	3	3	40	60	100	3
ASH-MAT-115A	Basics of Mathematics-I	2	0	0	2	2	40	60	100	3
Value Added Course (VAC)										
BT-CE-104A	Environmental Studies	2	0	0	2	2	40	60	100	3
Skill Enhancement Course (SEC)										
BCA-105A	Problem Solving through C	3	0	0	3	3	40	60	100	3
Ability Enhancement Course (AEC)										
ASH-HUM-117A	English Language and Communication-1	2	0	0	2	2	40	60	100	3
Multi Disciplinary Course (MDC)										
BBA-215A	Digital Marketing	2	0	0	2	2	40	60	100	3
Practicum Course (PC)										
BCA-171A	Digital Logic Design Lab	0	0	4	4	2	50	50	100	3
BCA-173A	Problem Solving through C Lab	0	0	4	4	2	50	50	100	3
Total		17	0	8	25	21	380	520	900	

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)										
Bachelor of Computer Applications (CTIS) Semester – II										
Course Code	**Course Title**	**Period(s)**			**Hours/ Week**	**Credit(s)**	**Continuous Internal Examination**	**Semester End Examination**	**Total Marks**	**Duration of Exam (Hours)**
							(CIE)	(SEE)	(CIE+SEE)	
		L	T	P			Max	Max	Max	
Core Course (CC)										
BCA-102A	Operating System	3	0	0	3	3	40	60	100	3
BCA-112A	Data Structures using C++	3	0	0	3	3	40	60	100	3
BCA-114A	Introduction to Cloud Computing	2	0	0	2	2	40	60	100	3
ASH-MAT-116A	Basics of Mathematics-II	2	0	0	2	2	40	60	100	3
Value Added Course (VAC)										
ASH-HUM-107A	Universal Human Values	2	0	0	2	2	40	60	100	3
Skill Enhancement Course (SEC)										
BCA-106A	Introduction to Web Technology	3	0	0	3	3	40	60	100	3
Ability Enhancement Course (AEC)										
ASH-HUM-118A	English Language and Communication-2	2	0	0	2	2	40	60	100	3
Multi Disciplinary Course (MDC)										
ASH-HUM-119A	Indian Knowledge System	2	0	0	2	2	40	60	100	3
Practicum Course (PC)										
BCA-174A	Web Technology Lab	0	0	4	4	2	50	50	100	3
BCA-182A	Data Structures Lab	0	0	4	4	2	50	50	100	3
Total		19	0	8	27	23	420	580	1000	
Grand Total (Exit with 1 year Certificate)		36	0	16	52	48	900	1100	2000	

Note 1: The Industrial Internship shall be of 4 credits duration of 45-60 days after the 2nd semester. If a student takes exit after 2nd semester with **Under Graduate Certificate in Computer Applications (Cloud Technology and Information Security)**, marks of Industrial Internship shall be counted in 2nd semester itself.

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)
Bachelor of Computer Applications (CTIS) Semester – III

Course Code	Course Title	Period(s) L	T	P	Hours/Week	Credit(s)	Continuous Internal Examination (CIE) Max	Semester End Examination (SEE) Max	Total Marks (CIE+SEE) Max	Duration of Exam (Hours)
Core Course (CC)										
BCA-201A	Software Engineering	3	0	0	3	3	40	60	100	3
BCA-211A	Linux and Shell Programming	3	0	0	3	3	40	60	100	3
BCA-203A	Database Management System	3	0	0	3	3	40	60	100	3
BCA-213A	Introduction to Information Security	2	0	0	2	2	40	60	100	3
Skill Enhancement Course (SEC)										
BCA-215A	Full Stack Development-1 (MERN)	3	0	0	3	3	40	60	100	3
Ability Enhancement Course (AEC)										
BBA-217A	Personality Development	2	0	0	2	2	40	60	100	3
Practicum Course (PC)										
BCA-281A	Linux and Shell Programming Lab	0	0	4	4	2	50	50	100	3
BCA-273A	Database Management System Lab	0	0	4	4	2	50	50	100	3
BCA-283A	Full Stack Development-1 (MERN) Lab	0	0	4	4	2	50	50	100	3
Total		16	0	12	28	22	390	510	900	

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)
Bachelor of Computer Applications (CTIS) Semester – IV

Course Code	Course Title	Period(s) L	T	P	Hours/Week	Credit(s)	Continuous Internal Examination (CIE) Max	Semester End Examination (SEE) Max	Total Marks (CIE+SEE) Max	Duration of Exam (Hours)
Core Course (CC)										
BCA-212A	Data Communication and Computer Networks	3	0	0	3	3	40	60	100	3
BCA-214A	Cyber Laws and Ethics	3	0	0	3	3	40	60	100	3
BCA-216A	Fundamental of Storage and Data Centres	3	0	0	3	3	40	60	100	3
Value Added Course (VAC)										
BCA-202A	Quantitative Aptitude	2	0	0	2	2	40	60	100	3
Skill Enhancement Course (SEC)										
BCA-218A	Full Stack Development-2 (MEAN)	2	0	0	2	2	40	60	100	3
Discipline specific Elective Course (DSE)										
BCA-260A	Elective-I	3	0	0	3	3	40	60	100	3
Practicum Course (PC)										
BCA-282A	Storage and Data Centres Lab	0	0	4	4	2	50	50	100	3
BCA-284A	Full Stack Development-2 (MEAN) Lab	0	0	4	4	2	50	50	100	3
BCA-286A	Elective-I Lab	0	0	4	4	2	50	50	100	3
Total		16	0	12	28	22	390	510	900	
Grand Total (Exit with 2 years Diploma)		68	0	40	108	92	1680	2120	3800	

Note 2: The Industrial Internship shall be of 4 credits duration of 45-60 days after the 4th semester. If a student takes exit after 4th semester with **Under Graduate Diploma in Computer Applications (Cloud Technology and Information Security)**, marks of Industrial Internship (either done after 2nd or 4th semester) shall be counted in 4th semester itself.

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)
Bachelor of Computer Applications (CTIS) Semester – V

Course Code	Course Title	Period(s)			Hours/ Week	Credit(s)	Continuous Internal Examination (CIE) Max	Semester End Examination (SEE) Max	Total Marks (CIE+SEE) Max	Duration of Exam (Hours)
		L	T	P						
Core Course (CC)										
BCA-311A	Principle of Virtualization	3	0	0	3	3	40	60	100	3
BCA-313A	Cloud Web Services	3	0	0	3	3	40	60	100	3
BCA-315A	Cryptography and Network Security	3	0	0	3	3	40	60	100	3
Discipline specific Elective Course (DSE)										
BCA-359A	Elective-II	3	0	0	3	3	40	60	100	3
Skill Enhancement Course (SEC)										
BCA-371A	Seminar	0	0	2	2	1	100		100	3
Practicum Course (PC)										
BCA-381A	Virtualization Lab	0	0	4	4	2	50	50	100	3
BCA-383A	Cloud Web Services Lab	0	0	4	4	2	50	50	100	3
Industrial Internship (INTR)										
BCA-377A	Industrial Internship	0	0	0	0	4	100		100	3
Total		12	0	10	22	21	460	340	800	

Note 3: If a student pursues 3 years UG Programme without taking Exit option, the Industrial Internship (either done after 2nd or 4th semester) will be taken into account in 5th semester.

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)
Bachelor of Computer Applications (CTIS) Semester – VI

Course Code	Course Title	Period(s)			Hours/ Week	Credit(s)	Continuous Internal Examination (CIE) Max	Semester End Examination (SEE) Max	Total Marks (CIE+SEE) Max	Duration of Exam (Hours)
		L	T	P						
Core Course (CC)										
BCA-312A	Network Administration	3	0	0	3	3	40	60	100	3
BCA-314A	Containerization using Docker	3	0	0	3	3	40	60	100	3
Discipline specific Elective Course (DSE)										
BCA-360A	Elective-III	3	0	0	3	3	40	60	100	3
Skill Enhancement Course (SEC)										
BBA-304A	Entrepreneurship and Startups	2	0	0	2	2	40	60	100	3
Practicum Course (PC)										
BCA-382A	Network Administration Lab	0	0	4	4	2	50	50	100	3
BCA-384A	Containerization using Docker Lab	0	0	4	4	2	50	50	100	3
BCA-376A	Minor Project	0	0	8	8	4	50	50	100	3
Total		11	0	16	27	19	310	390	700	
Grand Total (Exit with 3 years Degree)		91	0	66	157	128	2350	2850	5200	

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)
Bachelor of Computer Applications Semester – VII (Honours)

Course Code	Course Title	Period(s)			Hours/ Week	Credit(s)	Continuous Internal Examination (CIE) Max	Semester End Examination (SEE) Max	Total Marks (CIE+SEE) Max	Duration of Exam (Hours)
		L	T	P						
Honour Course (HC)										
BCA-451A	Design and Analysis of Algorithm	3	0	0	3	3	40	60	100	3
BCA-453A	Optimization Techniques	3	0	0	3	3	40	60	100	3
Value Added Course (VAC)										
BT-ME-112A	Design Thinking and Innovation	2	0	0	2	2	40	60	100	3
Practicum Course (PC)										
BCA-471A	Design and Analysis of Algorithm Lab	0	0	4	4	2	50	50	100	3
BCA-473A	Major Project-1	0	0	20	20	10	50	50	100	3
Total		8	0	24	32	20	220	280	500	

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)
Bachelor of Computer Applications Semester – VIII (Honours)

Course Code	Course Title	Period(s)			Hours/ Week	Credit(s)	Continuous Internal Examination (CIE) Max	Semester End Examination (SEE) Max	Total Marks (CIE+SEE) Max	Duration of Exam (Hours)
		L	T	P						
Honour Course (HC)										
BCA-315A	Cryptography and Network Security	3	0	0	3	3	40	60	100	3
BCA-452A	Computer Graphics	3	0	0	3	3	40	60	100	3
Practicum Course (PC)										
BCA-472A	Computer Graphics Lab	0	0	4	4	2	50	50	100	3
BCA-474A	Major Project-2	0	0	20	20	10	50	50	100	3
Total		6	0	24	30	18	180	220	400	
Grand Total (4 years Honours Degree)		101	0	114	215	162	2670	3230	5900	

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)
Bachelor of Computer Applications Semester – VII (Honours with Research)

Course Code	Course Title	Period(s)			Hours/ Week	Credit (s)	Continuous Internal Examination (CIE) Max	Semester End Examination (SEE) Max	Total Marks (CIE+SEE) Max	Duration of Exam (Hours)
		L	T	P						
Honour Course (HC)										
BCA-455A	Research Methodology	3	0	0	3	3	40	60	100	3
BCA-457A	Image Processing	3	0	0	3	3	40	60	100	3
Value Added Course (VAC)										
BT-ME-112A	Design Thinking and Innovation	2	0	0	2	2	40	60	100	3
Practicum Course (PC)										
BCA-475A	Image Processing Lab	0	0	4	4	2	50	50	100	3
BCA-473A	Major Project-1	0	0	20	20	10	50	50	100	3
Total		8	0	24	32	20	220	280	500	

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)
Bachelor of Computer Applications Semester – VIII (Honours with Research)

Course Code	Course Title	Period(s)			Hours/ Week	Credit (s)	Continuous Internal Examination (CIE) Max	Semester End Examination (SEE) Max	Total Marks (CIE+SEE) Max	Duration of Exam (Hours)
		L	T	P						
Practicum Course (PC)										
BCA-476A	Dissertation	0	0	36	36	18	100	100	200	3
Total		0	0	36	36	18	100	100	200	
Grand Total (4 years Honours with Research Degree)		95	0	126	221	162	2590	3110	5700	

Abbreviations Used:

Abbreviation	Full Form	Description
CC	Core Course	Compulsory core course for the programme, CC will be a theory course of 3 credits
PC	Practicum Course	Compulsory practical course (software lab) of 2 credits
INTR	Industrial Internship	• A student can do Industrial Internship of 45-60 days duration after the 2nd or 4th semester. It will be of 4 credits. • If a student pursues 3 year UG Programme without taking Exit option, this internship (either done after 2nd or 4th semester) will be taken into account in 5th semester. • If a student takes Exit after 2 years in UG Programme, this internship (either done after 2nd or 4th semester) will be taken into account in 4th semester. • If a student takes Exit after 1 year in UG Programme, the mandatory internship done after 2nd semester will be taken into account in 2nd semester.
SEC	Skill Enhancement Course	These courses aim at imparting knowledge, practical skills, hands-on training and competencies, soft skills, etc. to enhance the employability of students.
AEC	Ability Enhancement Course	These courses aim at enabling the students to achieve competency in the English language with special emphasis on communication skills.
VAC	Value-Added Course	This course aims to instil in students (i) Universal Human Values, (ii) Environmental Studies (iii) Quantitative Aptitude.

MDC	**Multi-Disciplinary Course**	These courses are based on introductory knowledge in a subject which is different from the main discipline of study to gain knowledge across the disciplines. Students are not allowed to choose or repeat courses already undergone at the Senior Secondary Level (Class XII) or disciplines of study under this category. Provided further that if a Multidisciplinary Course (MDC) across the discipline cannot be offered by a Department/ Institute, due to its constraints and available resources, then i) A subject from the same discipline can be offered as a MDC course if that subject also belongs to the list of subjects of some other discipline. ii) MDC can be opted out of Massive Open Online Courses (MOOCs) from **NPTEL, SWAYAM**. It shall be of minimum 2 credits.
DSE	**Discipline-specific Elective Course**	A discipline-specific elective course is a course aimed at imparting options for varied knowledge and skills in the specialized fields of a discipline/subject.
HC	**Honour Course**	A honour course in the 4th year of the Honours or Honours with Research Degree Programme.

List of Discipline-specific Elective Courses

Elective No.	Semester	Course Code	Elective Course Name
Elective-I	IV	BCA-260A(i)	Essentials of Python
		BCA-260A(ii)	Java Programming
Elective-II	V	BCA-359A(i)	Foundations of Artificial Intelligence
		BCA-359A(ii)	Internet of Things and its Applications
Elective-III	VI	BCA-360A(i)	Blockchain Technology
		BCA-360A(ii)	Web Security
Elective-IV	VII (Honours)	BCA-459A(i)	Data Warehousing and Data Mining
		BCA-459A(ii)	Server Administration
	VII (Honours with Research)	BCA-461A(i)	Data Warehousing and Data Mining
		BCA-461A(ii)	Quantum Computing
Elective-V	VIII (Honours)	BCA-462A(i)	Digital Forensic and Investigation
		BCA-462A(ii)	Ethical Hacking

Note 4: Relative weightage of Continuous Internal Evaluation (CIE) and Semester End Examination (SEE), criteria of passing marks, evaluation procedure, and other guidelines are as per the Ordinance of Under Graduate Degree Programmes: Bachelor of Computer Applications, Bachelor of Computer Applications (Cloud Technology and Information Security), Bachelor of Computer Applications (Data Science).