



Graphic Era
(Deemed to be University)
Accredited by NAAC with Grade A



**CURRICULUM
for
UNDERGRADUATE DEGREE PROGRAM**

IN

B.Sc. (Information Technology)

Scheme of Teaching and Evaluation 2021

**Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2021-22)**



Department of Computer Applications
GRAPHIC ERA (DEEMED TO BE UNIVERSITY)

566/6, Bell Road, Clement Town,
Dehradun, Uttarakhand 248002 INDIA
<https://www.geu.ac.in>



CONTENTS

Sl. No.	Description	Page No.
1.	Preamble	3
2.	About the Program	3
3.	Vision and Mission	4
4.	Program Educational Objective (PEOs)	5
5.	Program Outcomes (POs)	5
6.	Program Specific Outcomes (PSOs)	6
7.	Program Structure & Scheme	7
8.	List of Potential Recruiters for Employing Graduates in B.Sc. (IT)	14



1. Preamble

The growing dependence on information technology across industries, governance, and society has transformed the way knowledge, services, and businesses operate. With the rise of digital transformation, there is a pressing need for professionals who can understand, design, and manage IT solutions to meet global challenges. Higher education must therefore provide students with a strong foundation in computing principles, practical problem-solving, and adaptability to emerging technologies. The Bachelor of Science in Information Technology (B.Sc. IT) at Graphic Era (Deemed to be University) has been designed under the frameworks of Outcome-Based Education (OBE) and the Choice Based Credit System (CBCS). The curriculum emphasizes both disciplinary depth and multidisciplinary breadth, blending theoretical concepts with experiential learning. This ensures that students are well-prepared to thrive in diverse IT roles, pursue higher studies, and contribute to innovation and research.

2. About the Program

The Bachelor of Science in Information Technology (B.Sc. IT) is a three-year undergraduate program divided into six semesters. The program is designed to provide comprehensive knowledge and practical skills in IT systems, programming, databases, networking, cloud technologies, and emerging areas such as cryptography and business intelligence. The program offers a balanced mix of disciplinary courses. Students gain hands-on experience through programming laboratories, software projects, internships, and research opportunities.

The curriculum also emphasizes skill enhancement and holistic development through courses on communication, career success, and environmental awareness. With strong industry linkage and opportunities for global certification, graduates of this program are equipped to pursue careers as software developers, IT consultants, system analysts, web and mobile application developers, data analysts, and cloud professionals, or continue with postgraduate education and research.



3. Vision & Mission

3.1 Vision and Mission of the University

Vision

We visualize Graphic Era (Deemed to be University) as an internationally recognized, enquiry-driven, ethically engaged diverse community, whose members work collaboratively for positive transformation in the world, through leadership in teaching, research, and social action

Mission

The mission of the university is to promote learning in true spirit and offering knowledge and skills in order to succeed as professionals. The university aims to distinguish itself as a diverse, socially responsible learning community with a high quality scholarship and academic rigor.

3.2 Vision and Mission of the Department

Vision

To be a premier department recognized internationally for advancing knowledge and innovation in computer applications, fostering a diverse and ethically engaged community that drives positive technological transformation through excellence in teaching, research, and industry collaboration.

Mission

- M-1. Cultivate** a dynamic learning environment that promotes excellence in computer applications education, providing students with the knowledge and skills needed to thrive as professionals in a rapidly evolving industry.
- M-2. Contribute** to the university's mission by engaging in cutting-edge research and fostering innovative solutions that address complex technological challenges.
- M-3. Uphold** the values of diversity and social responsibility, ensuring that our programs and practices reflect a commitment to ethical standards and positive societal impact.
- M-4. Collaborate** with industry and community partners, enhancing our academic rigor and scholarship while preparing graduates to lead and excel in a global digital landscape.

4. Program Educational Objectives

- PEO-1. Technical Proficiency:** Provide graduates with a strong foundation in computer applications, programming languages, and software development, enabling them to build, maintain, and improve software systems and applications.
- PEO-2. Practical Problem-Solving:** Develop graduates' ability to apply theoretical knowledge to real-world problems, encouraging innovative thinking and practical problem-solving skills in various domains such as business, education, and healthcare.
- PEO-3. Professional Growth and Learning:** Foster a commitment to professional growth and lifelong learning, preparing graduates to pursue advanced studies, certifications, and adapt to the evolving landscape of technology and industry demands.
- PEO-4. Effective Communication and Ethical Practice:** Cultivate effective communication skills and ethical practices, enabling graduates to work collaboratively in teams, communicate technical concepts clearly, and uphold ethical standards in their professional careers.

5. Program Outcomes (POs)

After the successful completion of the program, the BCA graduate will be able to:

- PO-1. Fundamental Knowledge Application:** Apply foundational knowledge of mathematics, management, and computer applications to solve basic real-world problems effectively.
- PO-2. Basic Problem Analysis:** Identify and analyze problems using fundamental principles of mathematics and computer applications to develop initial solutions.
- PO-3. Solution Design and Development:** Design solutions for standard problems and develop system components or processes, considering essential health, safety, and societal aspects.
- PO-4. Research and Problem Solving:** Use basic research methods and data analysis techniques to investigate computing problems and draw preliminary conclusions.
- PO-5. Tool Utilization:** Select and apply appropriate tools and software for routine computing tasks, understanding their basic functions and limitations.
- PO-6. Awareness of Sustainability:** Understand the impact of software engineering solutions on society and the environment and appreciate the principles of sustainable development.



- PO-7. Ethical Practice:** Adhere to ethical principles and professional norms in software development and computing practices.
- PO-8. Individual and Teamwork:** Work effectively as an individual and as part of a team, demonstrating basic collaboration and leadership skills in various settings.
- PO-9. Effective Communication:** Communicate effectively on computing activities, preparing clear reports and documentation, and delivering presentations to a general audience.
- PO-10. Project Participation:** Apply basic project management principles to contribute effectively to team projects and understand the fundamental aspects of project planning and execution.
- PO-11. Foundation for Lifelong Learning:** Recognize the need for ongoing learning and be prepared to engage in further education or training to keep up with technological changes.
- PO-12. Innovation and Practical Application:** Identify opportunities for practical application of innovative ideas and contribute to solving problems in a way that adds value to projects and tasks.

6. Program Specific Outcomes (PSOs)

In addition to these twelve POs, the BCA graduate will also be able to:

- PSO-1. Application Development:** Design, develop, and deploy basic software applications using standard programming languages and development tools, addressing typical business and organizational needs.
- PSO-2. Fundamental Database Management:** Demonstrate proficiency in managing and using database systems, including designing database schemas, querying databases, and ensuring data integrity for various applications.
- PSO-3. System Analysis and Design:** Apply fundamental principles of system analysis and design to develop effective solutions for common computing problems, including requirements gathering, system modelling, and process design.



7. Program Structure & Scheme

A. Definition of Credit:

1 Hr. Lecture (L) per week	1 Credit
1 Hr. Tutorial (T) per week	1 Credit
1 Hr. Practical (P) per week	0.5 Credit
2 Hours Practical (P) per week	1 Credit

B. Nomenclature /

Code	Definitions
FC	Foundation Course
CC	Core Course
DE	Departmental Elective
IE	Elective Inter Departmental
SM	Seminar
CK	Career Skill
CM	Comprehension
PJ	Project
DS	Dissertation



<p style="text-align: center;">Graphic Era (Deemed to be University) B.Sc. IT Scheme of Teaching and Evaluation 2021 Outcome Based Education (OBE) and Choice Based Credit System (CBCS) (Effective from the academic year 2021-24)</p>											
Semester I											
COURSE MODULE				TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE			Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	Component									
TBI 101	Computer Fundamentals and Information Technology	FC	3	3	-	-	3	25	25	50	100
TBI 102	Programming Concepts Using C Language	CC	3	3	-	-	3	25	25	50	100
TBI 103	Mathematical Foundation of Computer Science	FC	3	3	1	-	4	25	25	50	100
TBI 104	Principles of Management	FC	3	2	-	-	2	25	25	50	100
TBI 105	Communication and Soft Skills	CK	2	2	-	-	3	25	25	50	100
PBI 101	PC Packages Lab (DOS & MS Office)	CC	2	-	-	2	2	25	25	50	100
PBI 102	Programming in C Lab	CC	2	-	-	2	2	25	25	50	100
SBI 101	Seminar	SM	1	-	-	-	-	-	-	100	100
GP 101	General Proficiency	GP	1	-	-	-	-	-	-	100	100
Total			20								900



<p style="text-align: center;">Graphic Era (Deemed to be University) B.Sc. IT Scheme of Teaching and Evaluation 2021 Outcome Based Education (OBE) and Choice Based Credit System (CBCS) (Effective from the academic year 2021-24)</p>											
Semester II											
COURSE MODULE				TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE			Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	Component									
TBI 201	Data Structures and File Organization	CC	3	3	-	-	3	25	25	50	100
TBI 202	Digital Electronics	CC	3	3	-	-	3	25	25	50	100
TBI 203	Object Oriented Programming Using C++	CC	3	3	-	-	3	25	25	50	100
TBI 204	Discrete Mathematical Structures	CC	4	3	1	-	4	25	25	50	100
TBI 205	Operating Systems	FC	3	3	-	-	3	25	25	50	100
TEV 222	Environment Studies	ES	1	1	-	-	2	25	25	50	100
PBI 201	Data Structure Lab	CC	2	-	-	2	2	25	25	50	100
PBI 202	Programming in C++ Lab	CC	2	-	-	-	-	100	-	-	100
SBI 201	Seminar	SM	1	-	-	-	-	100	-	-	100
GP 201	General Proficiency	GP	1	-	-	-	-	100	-	-	100
Total			23								1000



<p style="text-align: center;">Graphic Era (Deemed to be University) B.Sc. IT Scheme of Teaching and Evaluation 2021 Outcome Based Education (OBE) and Choice Based Credit System (CBCS) (Effective from the academic year 2021-24)</p>											
Semester III											
COURSE MODULE				TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE			Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	Component									
TBI 301	Database Management System	CC	3	3	-	-	3	25	25	50	100
TBI 302	Computer Organization and Architecture	CC	3	3	-	-	3	25	25	50	100
TBI 303	Data Communication and Computer Networks	CC	3	3	-	-	3	25	25	50	100
TBI 304	Software Engineering	CC	4	3	1	-	4	25	25	50	100
TBI 305	Java Programming	CC	3	3	-	-	1	25	25	50	100
TBI 306	Career Skills - I	CK	2	2	-	-	2	25	25	50	100
PBI 301	Database Management System Lab	CC	2	-	-	2	2	25	25	50	100
PBI 302	Java Programming Lab	CC	2	-	-	2	2	25	25	50	100
SBI 301	Seminar	SM	1	-	-	-	-	-	-	100	100
GP 301	General Proficiency	GP	1	-	-	-	-	-	-	100	100
Total			24								1000



<p>Graphic Era (Deemed to be University)</p> <p>B.Sc. IT</p> <p>Scheme of Teaching and Evaluation 2021</p> <p>Outcome Based Education (OBE) and Choice Based Credit System (CBCS)</p> <p>(Effective from the academic year 2021-24)</p>											
Semester IV											
COURSE MODULE				TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE			Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	Component									
TBI 401	Data Analytics using Python Programming	CC	3	3	-	-	3	25	25	50	100
TBI 402	Data Ware Housing and Mining	CC	3	3	-	-	3	25	25	50	100
TBI 403	Cryptography	CC	3	3	-	-	3	25	25	50	100
TBI 404	Android Programming	CC	4	3	1	-	4	25	25	50	100
TBI 405	Project Management and Information Systems	CC	3	3	-	-	3	25	25	50	100
TBI 406	Career Skills - II	CK	2	1	1	-	2	25	25	50	100
PBI 401	Data Analytics and Python Programming Lab	CC	2	-	-	2	2	25	25	50	100
PBI 402	Android Programming Lab	CC	2	-	-	2	2	25	25	50	100
BIP401	Mini Project – 1	PJ	2	-	-	4	-	-	-	100	100
GP401	General Proficiency	GP	1	-	-	-	-	-	-	100	100
Total			25								1000



<p style="text-align: center;">Graphic Era (Deemed to be University) B.Sc. IT Scheme of Teaching and Evaluation 2021 Outcome Based Education (OBE) and Choice Based Credit System (CBCS) (Effective from the academic year 2021-24)</p>											
Semester V											
COURSE MODULE				TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE			Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	Component									
TBI 501	Programming with .Net C#	CC	3	3	-	-	3	25	25	50	100
TBI 502	Web Technology	CC	4	3	1	-	4	25	25	50	100
TBI 503	Fundamentals of Artificial Intelligence	CC	3	3	-	-	3	25	25	50	100
TBI 504	Cloud Computing	DE	3	3	-	-	3	25	25	50	100
TBI 505	Career Skills - III	CK	2	2	-	-	2	25	25	50	100
PBI 501	Programming in C#.Net Lab	CC	2	-	-	4	4	25	25	50	100
PBI 502	Web Technology Lab	CC	2	-	-	4	4	25	25	50	100
BIP 501	Mini Project - II	PJ	2	-	-	4	4	25	25	50	100
GP 501	General Proficiency	GP	1	-	-	-	-	-	-	100	100
Total			22								900



<p style="text-align: center;">Graphic Era (Deemed to be University) B.Sc. IT Scheme of Teaching and Evaluation 2021 Outcome Based Education (OBE) and Choice Based Credit System (CBCS) (Effective from the academic year 2021-24)</p>											
Semester VI											
COURSE MODULE				TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE			Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	Component									
TBI 601	Computer Based Numerical Techniques	CC	4	3	1	-	4	25	25	50	100
TBI 602	Computer Graphics	CC	3	3	-	-	3	25	25	50	100
TBI 603	Network Security and Cyber Law	CC	3	3	-	-	3	25	25	50	100
TBI 604	Distributed System	DE	3	3	-	-	3	25	25	50	100
PBI 601	Computer Based Numerical Techniques Lab	CC	2	-	-	2	2	25	25	50	100
PBI 602	Computer Graphics Lab	CC	2	-	-	8	-	-	-	100	100
BIP 601	Project and Comprehensive Viva Voce	PJ	3	-	-	-	-	-	-	100	100
GP 601	General Proficiency	GP	1	-	-	-	-	-	-	100	100
Total			21								800

8. List of Potential Recruiters for Employing Graduates in B.Sc. IT

- Microsoft Corporation
- Google
- Adobe
- Amazon
- Walmart Global Technology
- Coforge
- TCS
- Infosys
- Capgemini
- HCL
- Informatica
- Teradata
- EY India
- 75Way Technologies
- Global Logic
- PWC
- Enquero Global
- HSBC
- Accenture
- Accolite
- Cognizant
- Vinculum
- Atlassian
- Airbus India
- Tally India
- Morgan Stanley
- Flipkart
- L&T Infotech
- Apps Associates
- Acuity Knowledge
- LTTS
- LTIMindtree
- IBM
- Zscaler
- Goldman Sachs
- Latent View
- Bonami Software
- Incture
- ANM
- Wissen Technologies
- DXC
- Contata
- Sopra Steria
- MAQ Software
- Intel
- Hexaware Technology
- Yamaha
- JSW
- Autopay
- Nineleaps
- American Express
- Salesforce
- Lowes India
- AbinBevGCC
- Siemens
- Deloitte And many more