



Graphic Era
Deemed to be University

Accredited 'A+' Grade by NAAC



CURRICULUM
for
UNDERGRADUATE DEGREE PROGRAM

BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND BUSINESS SYSTEMS
(Batch 2023-27) onwards

In accordance with NEP 2020
Dept. of Computer Science and Engineering
GRAPHIC ERA (DEEMED TO BE UNIVERSITY)

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CONTENTS

1.	PREAMBLE	3
2.	INTRODUCTION	3
3.	NATURE OF BACHELOR'S DEGREE PROGRAMME IN COMPUTER SCIENCE AND BUSINESS SYSTEMS	4
4.	PROGRAMME OBJECTIVE	5
5.	PROGRAMME OUTCOMES	5
6.	PROGRAMME SPECIFIC OUTCOMES	6
7.	PROGRAMME STRUCTURE	7
8.	LIST OF POTENTIAL RECRUITERS FOR EMPLOYING GRADUATES IN COMPUTER SCIENCE AND BUSINESS SYSTEMS	19



1. Preamble

The role of higher education is very important in securing the gainful employment and/or providing further access to higher education comparable to the best available in the world class institutions elsewhere. The improvement in the quality of higher education, therefore, deserves to be given highest priority to enable the young generation of students to acquire skill, training and knowledge in order to enhance their thinking, comprehension and application abilities and prepare them to compete, succeed and excel globally. Sustained initiatives are required to reform the present higher education system for improving and upgrading the academic resources and learning environments by raising the quality of teaching and standards of achievements in learning outcomes in undergraduate programs. The Graphic Era (Deemed to be University) upgraded its undergraduate programmes in Computer Science and Engineering in accordance with NEP, 2020 along with the Learning Outcomes-based Curriculum Framework (LOCF) which makes it student-centric, interactive and outcome-oriented with well-defined aims, objectives and goals to achieve. NEP, 2020 aims at making higher education multidisciplinary learning process. In other words, the curriculum will be flexible, it will allow students to take up creative subject-combinations.

2. Introduction

The Department of Computer Science & Engineering was established in the year 2001. Since then, the department has held a position of pride in Graphic Era (Deemed to be University). It has consistently fulfilled its role of producing Computer Engineers ready to meet the demands of the IT world. The department has always attracted the best of engineering aspirants from all over the country. It has a well-qualified and experienced team of faculty. The Department offers B.Tech., M.Tech., and Ph.D. courses in Computer Science and Engineering. The department has adequate facilities to support these teaching activities. Students of the department have access to sufficient high end computing facilities. The Department is also actively involved in various research activities. The facilities are adequate to cater to the needs of Research activities. The department has signed MoU with reputed Companies and University, for academic collaborative projects.

This curriculum is designed to provide students with a strong foundation in computer science concepts, along with an understanding of business processes and management principles. The program is divided into eight semesters. The early semesters lay the foundation for the program and cover topics such as programming fundamentals, digital systems, mathematics, and business communication. They continue to build on the fundamentals and cover topics such as data structures, discrete mathematics, computer organisation and architecture, and business



economics. They also focus on software development and cover topics such as programming languages, software engineering, database management systems, and financial accounting. Finally they delve deeper into computer science and covers topics such as computer networks, operating systems, algorithms, and human-computer interaction. The later semesters introduce students to business systems and cover topics such as business analytics, organisational behaviour, operations management, and marketing management. They continue to build on business systems and cover topics such as supply chain management, financial management, business intelligence, and e-commerce.

3. Nature of Bachelor's Degree Programme in Computer Science and Business Systems

The curriculum of bachelor's degree in Computer Science and Business Systems is divided into 4 stages with multiple exit-entry as per NEP 2020. The type of award, stage of exit and the mandatory credits to be achieved by the student at the time of exit is described in the table below.

S. No	Type of Award	Stage of Exit	Mandatory credits to be secured for the award
1.	Undergraduate Certificate in Computer Science and Business Systems	For those who exit after the first year (two semesters) of the undergraduate programme. (Programme duration: first year or two semesters of the undergraduate programme)	49
2.	Undergraduate Diploma in Computer Science and Business Systems	For those who exit after two years (four semesters) of the undergraduate programme (Programme duration: First two years or four semesters of the undergraduate programme)	109
3.	Bachelor of Science in Computer Science and Business Systems	For those who exit after three years (six semesters) of the undergraduate programme (Programme duration: First three years or six semesters of the undergraduate programme).	162
4.	Bachelor of Technology in Computer Science and Business Systems	For those who exit after four years (eight semesters) of the undergraduate programme (Programme duration: First four years or eight semesters of the undergraduate programme).	215

4. Programme Educational Objectives



PEO1: To produce students employable towards building a successful career based on sound understanding of theoretical and applied aspects of computer science and business systems as well as methodology to solve multidisciplinary real life problems.

PEO2: To produce professional graduates ready to work with a sense of responsibility, ethics and enabling them to work efficiently individually and also as a team.

PEO3: To impart the competency in students so that they are able to pursue higher studies and research in areas of engineering and other professionally related fields.

PEO4: To inculcate ability to adapt to the changing technology through continuous learning.

5. Programme Outcomes (POs)

Engineering Graduates will be able to:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.



PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

6. Programme Specific Outcomes (PSOs)

In addition to these twelve POs, three Programme Specific Outcomes (PSOs) are formulated

PSO1: Ability to analyze, design, apply appropriate techniques, modern engineering and business tools including prediction and data analytics to complex engineering problems and business solutions.

PSO2: Apply computer science theory blended with engineering mathematics to solve problems effective decision making in several domains like business processes and other domains, and model real world problems using appropriate programming language, data structure, and algorithms.

PSO3: Ability to explore technological advancements in the domains like finance and risk management, evaluate its merits and identify research gaps to provide solution to new ideas and innovations.



7. Programme Structure

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. Code and Definition

Code	Definitions
L	Lecture
T	Tutorial
P	Practical
DC	Discipline Specific Core
DE	Discipline Specific Elective
GE	Generic Elective
AE	Ability Enhancement Course
SE	Skill Enhancement Course
IA	Internship/Apprenticeship/Project/Community Outreach
VA	Value Addition Course
B. Tech	Bachelor of Technology

Definitions

1. Courses of study – Courses of study indicates pursuance of study in a particular discipline. Every discipline shall offer various categories of courses of study, viz. Discipline Specific Core courses (DC), Discipline Specific Electives (DE), Generic Electives (GE), Ability Enhancement Course (AE), Skill Enhancement Course (SE), Value Addition Course (VA) and Internship/Apprenticeship/Project/Community Outreach (IA)

a) Discipline Specific Core (DC): Discipline Specific Core is a course of study, which should be pursued by a student as a mandatory requirement of his/her programme of study. DC shall be the core credit courses of that particular discipline which will be appropriately graded and arranged across the semesters of study, being undertaken by the student, with multiple exit options as per NEP 2020.

b) Discipline Specific Elective (DE): The Discipline Specific Electives (DE) shall be a pool of credit courses of that particular discipline (single discipline programme of study) or those disciplines (multidisciplinary programme of study), as the case may be, which a student chooses



to study from his/her particular discipline(s). There shall be a pool of DE from which a student may choose a course of study.

c) Generic Elective (GE): An elective course chosen generally from other discipline(s) with an intention to seek exposure is called a Generic Elective. GE shall consist of a pool of courses offered by various disciplines of study in groups of odd and even semesters, from which a student can choose.

d) Ability Enhancement Course (AE): AE courses are the courses based upon the content that leads to knowledge enhancement through various areas of study.

e) Skill Enhancement Course (SE): SE courses are skill-based courses in all disciplines and are aimed at providing hands-on-training, competencies, skills, etc. SE courses may be chosen from a pool of courses designed to provide skill-based instruction.

f) Value Addition Course (VA): VA courses are value-based courses which are meant to inculcate ethics, culture, Indian Knowledge systems, constitutional values, soft skills, sports education and such similar values to students which will help in all round development of students.

g) Internship/Apprenticeship/Project/Community Outreach (IA):

- i. Internship /Apprenticeship: All students will also undergo internships / Apprenticeships in a firm, industry, or organization or Training in labs with faculty.
- ii. Project: Students are required to take up research projects under the guidance of a faculty member. The students are expected to complete the Research Project in the eighth semester. The research outcomes of their project work may be published in peer-reviewed journals or may be presented in conferences /seminars or may be patented.
- iii. Community Outreach: The curricular component of 'Community Outreach' seeks to expose students to the socio-economic issues in society so that the theoretical learnings can be supplemented by actual life experiences to generate solutions to real-life problems.



C. Course level coding scheme

Three-digit number used as suffix with the Course Code for identifying the level of the course.

Digit at hundred's place signifies the semester in which course is offered. e.g.

101, 102 ... etc. for first semester.

201, 202 etc. for second semester.

301, 302 ... etc. for third semester.

D. Evaluation Scheme:

a. For Theory and Practical Courses:

The weightage of marks are as follows:

- i. Continuous Internal Evaluation (CIE): 25% (25 Marks)
- ii. Mid Semester Examinations (MSE): 25% (25 Marks)
- iii. Semester End Examinations (SEE): 50% (50 Marks)

The student has to obtain at least 40% marks in SEE for theory courses and 50% of marks in SEE for practical courses.

b. For Internship/Apprenticeship/Project etc. Evaluation is based on work done, quality of report, performance in viva-voce, presentation etc.

E. SEMESTER WISE STRUCTURE:

- Every semester offers various categories of courses of study, viz. Discipline Specific Core courses (DC), Discipline Specific Electives (DE), Generic Electives (GE), Ability Enhancement Course (AE), Skill Enhancement Course (SE) and Value Addition Course (VA)
- There shall be choice from Semester III to Semester VIII to choose a subject from DE
- There shall be choice from Semester III to Semester VIII to choose a subject from GE



Course Components of Academic Programme B.Tech (Computer Science and Business Systems)

Minimum Duration : 8 Semesters (4 Years)

Maximum Duration : 12 Semesters (6 Year)

Total Number of Credits : 215 Credits

Course Components		Credits
1.	Compulsory Courses	
I.	Discipline Specific Core (CC)	145
2.	Elective Courses	
I.	Discipline Specific Elective (DE)	Min 11-Max 28
II.	Generic Elective (GE)	Max 7
3.	Ability Enhancement Course (AE)	8
4	Value Added Course (VA)	10
5	Skill Enhancement Course (SE)	12
6	Internship/Apprenticeship/ Project	12

A. Requirement of Awards of Degree: - CGPA \geq 4.5 Clearance of total no. of credits as 191 and any other condition as per regulation and ordinances.



B.Tech (Computer Science and Business Systems) CURRICULUM STRUCTURE AND EVALUATION SCHEME W.E.F 2023-24

SEMESTER: I

COURSE MODULE Physics/ Chemistry Group				TEACHING PERIODS			WEIGHTAGE : EVALUATION			
COURSE			Credits	L	T	P	CIE	MSE	SEE	Total
Code	Title	Component								
TTC101	Discrete Mathematics	DC	4	3	1	-	25	25	50	100
TTC102	Introductory Topics in Statistics, Probability and Calculus	DC	3	3	-	-	25	25	50	100
TCS101	Fundamentals of Computer and Introduction to Programming	DC	3	3	-	-	25	25	50	100
TTC104	Principles of Electrical Engineering	DC	2	2	-	-	25	25	50	100
TTC105	Physics for Computing Science	DC	2	2	-	-	25	25	50	100
TTC106	Business Communication & Value Science - I	AE	2	1	-	2	25	25	50	100
PCS151	Computer Lab- I	DC	2	-	-	4	25	25	50	100
PTC105	Physics Lab	DC	1	-	-	2	25	25	50	100
PTC104	Electrical Engineering Lab.	DC	1	-	-	2	25	25	50	100
PME151	Workshop and Manufacturing Practices	SE	3	1	-	4	25	25	50	100
GP101	General Proficiency-I /NCC/Yoga/ Sports /Cultural	VA	1	-	-	2	-	-	100	100
THF101	Healthy Living & Fitness	VA	0	1	-	-	-	-	100	100
NTC101	Induction Program		0	-	-	-	-	-	-	-
Total			24	17	1	16	250	250	700	1200



SEMESTER: II

COURSE MODULE Chemistry/ Physics Group				TEACHING PERIODS			WEIGHTAGE : EVALUATION			
COURSE			Credits	L	T	P	CIE	MSE	SEE	Total
Code	Title	Component								
TTC201	Linear Algebra	DC	4	3	1	-	25	25	50	100
TTC202	Statistical Methods	DC	4	3	1	-	25	25	50	100
TTC203	Fundamentals of Economics	DC	2	2	-	-	25	25	50	100
TCS201	Programming for Problem Solving	DC	3	3	-	-	25	25	50	100
TTC204	Principles of Electronics	DC	2	2	-	-	25	25	50	100
TTC205	Business Communication & Value Science – II	AE	2	2	-	-	25	25	50	100
PCS251	Computer Lab –II	DC	2	-	-	4	25	25	50	100
PTC202	Statistical Methods Lab	DC	1	-	-	2	25	25	50	100
PTC204	Principles of Electronics Lab	DC	1	-	-	2	25	25	50	100
PME253	Engg. Graphics and Design Lab.	SE	3	1	-	4	25	25	50	100
GP201	General Proficiency-II /NCC/Yoga/ Sports /Cultural	VA	1	-	-	2	-	-	100	100
TEV201	Environmental Science	VA	0	2	-	-	-	-	100	100
Total			25	18	2	14	250	250	700	1200


SEMESTER: III

COURSE MODULE				TEACHING PERIODS			WEIGHTAGE: EVALUATION			
COURSE			Credits	L	T	P	CIE	MSE	SEE	Total
Code	Title	Component								
TTC301	Formal Language and Automata Theory	DC	3	3	-	-	25	25	50	100
TTC302	Data Structures & Algorithms	DC	3	3	-	-	25	25	50	100
TTC303	Object Oriented Programming	DC	2	2	-	-	25	25	50	100
TTC304	Computational Statistics	DC	3	3	-	-	25	25	50	100
TTC305	Computer Organization & Architecture	DC	5	3	-	4	25	25	50	100
TTC306	Database Management Systems	DC	3	3	-	-	25	25	50	100
PTC304	Computational Statistics	DC	2	-	1	2	25	25	50	100
PTC302	Data Structures Lab	DC	2	-	1	2	25	25	50	100
PTC303	OOPS with C++ Lab	DC	2	-	1	2	25	25	50	100
PTC306	DBMS Lab	DC	2	-	1	2	25	25	50	100
XCS-301	Career Skills	VA	2	2	-	-	25	25	50	100
CSP-301	Mini Project	AE	1	-	-	2	-	-	100	100
GP-301	General Proficiency	SE	1	-	-	-	-	-	100	100
NTC301	Indian Constitution		0	-	-	-	-	-	-	-
Total			31	19	4	14	275	275	750	1300

NOTE:

- Generic Elective can also be opted from Swayam Portal and students should produce Grade certificate on successful completion of the course but the content should not match with the courses offered under the curriculum.
- General Proficiency shall be assessed based on the participation in NCC, NSS, Conferences (Research paper Publication (Journal/ Conference)), Organizing events, competitions (Inter University, State, National, International level) including Music, Debate, Sports, Hackathon and so on.



SEMESTER: IV

COURSE MODULE				TEACHING PERIODS			WEIGHTAGE:EVALUATION			
COURSE			Credits	L	T	P	CIE	MSE	SEE	Total
Code	Title	Component								
TTC401	Operating Systems	DC	3	3	-	-	25	25	50	100
TTC402	Design And Analysis of Algorithms	DC	3	3	-	-	25	25	50	100
TTC403	Software Engineering	DC	3	3	-	-	25	25	50	100
TTC405	Introduction to Innovation, IP Management & Entrepreneurship	DC	3	3	-	-	25	25	50	100
TTC406	Design Thinking	DC	3	2	-	2	25	25	50	100
TTC407	Operations Research	DC	2	2	-	-	25	25	50	100
PTC401	Operating Systems Lab	DC	2	-	1	2	25	25	50	100
PTC402	Algorithms Lab	DC	2	-	-	4	25	25	50	100
PTC403	Software Engineering Lab	DC	2	-	1	2	25	25	50	100
PTC407	Operations Research Lab	DC	2	-	1	2	25	25	50	100
XCS-401	Career Skills	VA	2	2	-	-	25	25	50	100
CSP-401	Mini Project	AE	1	-	-	2	-	-	100	100
GP- 401	General Proficiency	SE	1	-	-	-	-	-	100	100
NTC401	Essence of Indian Traditional Knowledge		0	-	-	-	-	-	-	-
Total			29	18	3	14	275	275	750	1300

NOTE:

1. Generic Elective can also be opted from Swayam Portal and students should produce Grade certificate on successful completion of the course but the content should not match with the courses offered under the curriculum.
2. General Proficiency shall be assessed based on the participation in NCC, NSS, Conferences (Research paper Publication (Journal/ Conference)), Organizing events, competitions (Inter University, State, National, International level) including Music, Debate, Sports, Hackathon and so on.



SEMESTER: V

COURSE MODULE				TEACHING PERIODS			WEIGHTAGE:EVALUATION			
COURSE			Credits	L	T	P	CIE	MSE	SEE	Total
Code	Title	Component								
TTC501	Software Design with UML	DC	2	2	-	-	25	25	50	100
TTC502	Compiler Design	DC	3	3	-	-	25	25	50	100
TTC503	Fundamentals of Management	DC	2	2	-	-	25	25	50	100
TTC504	Business Strategy	DC	2	2	-	-	25	25	50	100
	Discipline Specific Elective-I	DE	3	2	1	-	25	25	50	100
TTC505	Business Communication & Value Science – III	DC	2	2	-	-	25	25	50	100
PTC501	Software Design with UML Lab	DC	2	-	1	2	25	25	50	100
PTC502	Compiler Design Lab	DC	2	-	-	4	25	25	50	100
	Elective-I Lab	DE	2	-	1	2	25	25	50	100
XCS-501	Career Skills	VA	2	2	-	-	25	25	50	100
CSP-501	Mini Project	AE	1	-	-	2	-	-	100	100
GP-501	General Proficiency	SE	1	-	-	-	-	-	100	100
	Total		24	15	3	10	250	250	700	1200

DISCIPLINE SPECIFIC ELECTIVE- I

COURSE CODE	COURSE NAME
TTC506	Coversational Systems
TTC507	Cloud, Microservices & Application
TTC508	Machine Learning

NOTE:

1. Generic Elective can also be opted from Swayam Portal and students should produce Grade certificate on successful completion of the course but the content should not match with the courses offered under the curriculum.
2. General Proficiency shall be assessed based on the participation in NCC, NSS, Conferences (Research paper Publication (Journal/ Conference)), Organizing events, competitions (Inter University, State, National, International level) including Music, Debate, Sports, Hackathon and so on.



SEMESTER: VI

COURSE MODULE				TEACHING PERIODS			WEIGHTAGE:EVALUATION			
COURSE				L	T	P	CIE	MSE	SEE	Total
Code	Title	Component	Credits							
TTC601	Computer Networks	DC	3	3	-	-	25	25	50	100
TTC602	Information Security	DC	3	3	-	-	25	25	50	100
TTC603	Artificial Intelligence	DC	3	3	-	-	25	25	50	100
TTC604	Financial & Cost Accounting	DC	2	2	-	-	25	25	50	100
	Discipline Specific Elective-II	DE	3	3	-	-	25	25	50	100
TTC605	Business Communication & Value Science – IV	DC	3	2	-	2	25	25	50	100
PTC601	Computer Networks Lab	DC	2	-	-	4	25	25	50	100
PTC602	Information Lab	DC	2	-	1	2	25	25	50	100
PTC603	Artificial Intelligence Lab	DC	2	-	1	2	25	25	50	100
	Elective-II Lab	DE	2	-	1	2	25	25	50	100
XCS-601	Career Skills	VA	2	2	-	-	25	25	50	100
CSP-601	Mini Project	AE	1	-	-	2	-	-	100	100
GP-601	General Proficiency	SE	1	-	-	-	-	-	100	100
	Total		29	18	3	14	275	275	750	1300

DISCIPLINE SPECIFIC ELECTIVE-II

COURSE CODE	COURSE NAME
TTC606	Robotics and Embedded Systems
TTC607	Modern Web Applications
TTC608	Data Mining and Analytics

NOTE:

- Generic Elective can also be opted from Swayam Portal and students should produce Grade certificate on successful completion of the course but the content should not match with the courses offered under the curriculum.
- General Proficiency shall be assessed based on the participation in NCC, NSS, Conferences (Research paper Publication (Journal/ Conference)), Organizing events, competitions (Inter University, State, National, International level) including Music, Debate, Sports, Hackathon and so on.


SEMESTER: VII

COURSE MODULE				TEACHING PERIODS			WEIGHTAGE:EVALUATION			
COURSE			Credits	L	T	P	CIE	MSE	SEE	Total
Code	Title	Component								
TTC701	Usability Design of Software Applications	DC	2	2	-	-	25	25	50	100
TTC702	IT Workshop Skylab / Matlab	DC	1	1	-	-	25	25	50	100
TTC703	Financial Management	DC	3	3	-	-	25	25	50	100
	Discipline Specific Elective-III or Generic Elective-I	DE	4	2	1	2	25	25	50	100
	Discipline Specific Elective-IV	DE/GE	3	2	1	-	25	25	50	100
TTC704	Human Resource Management	DC	2	2	-	-	25	25	50	100
PTC701	Usability Design of Software Applications Lab	DC	2	-	1	2	25	25	50	100
PTC702	IT Workshop Skylab / Matlab	DC	2	-	-	4	25	25	50	100
	Elective-IV Lab	DE	2	-	1	2	25	25	50	100
SCS-701	Seminar on Industrial Interaction	IA	2	-	-	-	-	-	100	100
CTC-701	Major Project Phase I	IA	4	-	-	8	50	-	50	100
GP-701	General Proficiency	SE	1	-	-	-	-	-	100	100
	Total		28	12	4	18	275	225	700	1200

DISCIPLINE SPECIFIC ELECTIVE-III

Course Code	Course Name
TTC705	Cognitive Science & Analytics
TTC706	Introduction to IoT
TTC707	Cryptology

DISCIPLINE SPECIFIC ELECTIVE-IV

TTC708	Quantum Computation & Quantum Information
TTC709	Advanced Social, Text and Media Analytics
TTC710	Mobile Computing

NOTE:

- Generic Elective can also be opted from Swayam Portal and students should produce Grade certificate on successful completion of the course but the content should not match with the courses offered under the curriculum.
- General Proficiency shall be assessed based on the participation in NCC, NSS, Conferences (Research paper Publication (Journal/ Conference)), Organizing events, competitions (Inter University, State, National, International level) including Music, Debate, Sports, Hackathon and so on.



SEMESTER: VIII

COURSE DETAILS			TEACHING PERIODS			WEIGHTAGE:EVALUATION				
COURSE			Credits	L	T	P	CIE	MSE	SEE	Total
Code	Title	Component								
	Discipline Specific Elective-V or Generic Elective-II	DE/GE	4	3	-	2	25	25	50	100
TTC801	Services Science & Service Operational Management	DC	3	3	-	-	25	25	50	100
TTC802	IT Project Management	DC	2	2	-	-	25	25	50	100
	Discipline Specific Elective-VI	DE	3	3	-	-	25	25	50	100
PTC801	Services Science & Service Operational Management Lab	DC	2	-	1	2	25	25	50	100
PTC802	IT Project Management Lab	DC	2	-	1	2	25	25	50	100
	Elective-VI Lab	DE	2	-	1	2	25	25	50	100
CSC-801	Comprehensive Viva-Voce	IA	2	-	-	-	-	-	100	100
CTC-801	Major Project Phase II	IA	4	-	-	8	-	-	100	100
GP-801	General Proficiency	SE	1	-	-	-	-	-	100	100
	Total		25	11	3	18	175	175	650	1200

DISCIPLINE SPECIFIC ELECTIVE – V

Course Code	Course name
TTC803	Behavioral Economics
TTC804	Computational Finance & Modeling
TTC805	Psychology

DISCIPLINE SPECIFIC ELECTIVE - VI

TTC806	Enterprise Systems
TTC807	Advance Finance
TTC808	Image Processing and Pattern Recognition

NOTE:

- Generic Elective can also be opted from Swayam Portal and students should produce Grade certificate on successful completion of the course but the content should not match with the courses offered under the curriculum.
- General Proficiency shall be assessed based on the participation in NCC, NSS, Conferences (Research paper Publication (Journal/ Conference)), Organizing events, competitions (Inter University, State, National, International level) including Music, Debate, Sports, Hackathon and so on.



8. List of Potential Recruiters for Employing Graduates in Computer Science and Engineering

- 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