Graphic Era (Deemed to be University)

B.Tech. in Computer Science and Engineering (AI and ML)

Scheme of Teaching and Evaluation 2025

Outcome Based Education (OBE) and Choice Based Credit System (CBCS) as per NEP 2020

(Effective from the academic year 2025-26)

Semester I

COURSE MODULE					TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE				Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	NEP Component	AICTE Component									
TPH101/ 201	Engineering Physics	DSC	BSC	3	3	-	-	3	25	25	50	100
TMA102	Mathematics for AI-I	DSC	BSC	3	2	1	-	3	25	25	50	100
TEE101/ 201	Basic Electrical Engineering	DSC	ESC	2	2	-	-	2	25	25	50	100
TCS102	Introduction to Python Programming	DSC	ESC	3	3	-	-	3	25	25	50	100
PPH151/ 251	Physics Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PEE151/ 251	Electrical Engineering Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS152	Python Programming Lab	DSC	LC	2	-	-	4	4	25	25	50	100
PME151/ 251	Workshop And Manufacturing Practices	SEC	LC	2	-	-	4	4	25	25	50	100
THU101	Professional Communication	AEC	HSMC	2	2	-	-	2	25	25	50	100
HSMC 101/201	Design Thinking	VAC	HSMC	1	-	-	2	2	25	25	50	100
			Total	**20**								**1000**

Mandatory Non-Graded Course												
THF101/ 201	Healthy Living & Fitness	MNG	MC	2	2	-	-	2	-	-	100	100
									Qualified/ Non-Qualified			

Graphic Era (Deemed to be University)

B.Tech. in Computer Science and Engineering (AI and ML)

Scheme of Teaching and Evaluation 2025

Outcome Based Education (OBE) and Choice Based Credit System (CBCS) as per NEP 2020

(Effective from the academic year 2025-26)

Semester II

COURSE MODULE Physics/Chemistry Group					TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE				Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	NEP Component	AICTE Component									
TCH101/ 201	Engineering Chemistry	DSC	BSC	3	3	-	-	3	25	25	50	100
TMA203	Mathematics for AI-II	DSC	BSC	3	2	1	-	3	25	25	50	100
TCS202	Programming in C	DSC	ESC	3	3	-	-	3	25	25	50	100
TEC101/ 201	Basic Electronics Engineering	DSC	ESC	2	2	-	-	2	25	25	50	100
TCS203	Fundamentals of AI and ML	DSC	PCC	3	3	-	-	3	25	25	50	100
PCH151 /251	Chemistry Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS252	C Programming Lab	DSC	LC	2	-	-	4	4	25	25	50	100
PEC151/ 251	Electronics Engineering Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PME153 /253	Engineering Graphics and Design Lab	SEC	LC	2	-	-	4	4	25	25	50	100
PCE151/ 251	Basic Civil Engg Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS253	AI and ML Lab using Python	DSC	LC	1	-	-	2	2	25	25	50	100
GP201	General Proficiency-I	SEC	SEC	1	-	-	-	-	100	-	-	100
			Total	**23**								**1200**

Mandatory Non-Graded Course												
TEV101/201	Environmental Science	MNG	MC	2	2	-	-	2	-	-	100	100
									Qualified/ Non-Qualified			

Graphic Era (Deemed to be University)

B.Tech. in Computer Science and Engineering (AI and ML)

Scheme of Teaching and Evaluation 2025

Outcome Based Education (OBE) and Choice Based Credit System (CBCS) as per NEP 2020

(Effective from the academic year 2025-26)

Semester III

COURSE MODULE					TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE				Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	NEP Component	AICTE Component									
TCS308	Logic Design and Computer Organization	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS302	Data Structures with C	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS307	Object Oriented Programming with C++	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS368	Advanced Probability for AI	DSC	PCC	3	3	-	-	3	25	25	50	100
	Discipline Specific Elective-I	DSE	PEC	3	3	1	-	4	25	25	50	100
PCS308	Logic Design and Computer Organization Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS302	Data Structures Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS307	OOPS with C++ Lab	DSC	LC	1	-	-	2	2	25	25	50	100
XCS301	Career Skills-I	AEC	AEC	2	2	-	-	2	25	25	50	100
UHV301	UHV-II	VAC	VAC	2	2	-	-	2	25	25	50	100
			Total	**22**								**1000**

Optional									
		TEACHING PERIODS				**WEIGHTAGE: EVALUATION**			
	Credits	**L**	**T**	**P**	**Contact Hr.**	**CIE**	**MSE**	**ESE**	**Total**
**Minor-I/Specialization-I	3	3	-	-	3	25	25	50	100
** *List of minor/ specialization courses is mentioned on page no. 34-38*									

DISCIPLINE SPECIFIC ELECTIVE-I

COURSE CODE	COURSE NAME
TCS349	Responsible and Explainable AI
TCS331	Fundamentals of IoT
TCS351	Fundamentals of Cloud Computing and Big Data
TCS362	Statistical Learning For Reliability Analysis (Through Swayam)

NOTE:

1. The department will identify courses for Project-Based Learning (PBL) at the beginning of the semester. The implementation and evaluation of PBL courses will be carried out as per the SOP document. Each PBL course carries a total of 150 marks.
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.
3. *If the mentioned SWAYAM course is unavailable on the SWAYAM platform during the time of offering, the Departmental Committee will review and finalize a suitable alternative course available on the SWAYAM platform.

Graphic Era (Deemed to be University)

B.Tech. in Computer Science and Engineering (AI and ML)

Scheme of Teaching and Evaluation 2025

Outcome Based Education (OBE) and Choice Based Credit System (CBCS) as per NEP 2020

(Effective from the academic year 2025-26)

Semester IV

COURSE MODULE					TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE				Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	NEP Component	AICTE Component									
TCS408	Programming in Java	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS402	Finite Automata and Formal Languages	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS403	Microprocessors	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS409	Design and Analysis of Algorithms	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS464	Deep Learning	DSC	PCC	3	3	-	-	3	25	25	50	100
	Discipline Specific Elective-II	DSE	PEC	3	3	1	-	4	25	25	50	100
PCS408	Java Programming Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS403	Microprocessors Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS409	DAA Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS464	Deep Learning Lab	DSC	LC	1	-	-	2	2	25	25	50	100
XCS401	Career Skills-II	AEC	AEC	2	2	-	-	2	25	25	50	100
GP401	General Proficiency-II	SEC	SEC	1	-	-	-	-	100	-	-	100
			Total	**25**								**1200**

Mandatory Non-Graded Course												
HSS203	Constitution of India	MNG	MC	2	2	-	-	2	-	-	100	100
									Qualified/ Non-Qualified			

Optional									
		TEACHING PERIODS				**WEIGHTAGE: EVALUATION**			
	Credits	**L**	**T**	**P**	**Contact Hr.**	**CIE**	**MSE**	**ESE**	**Total**
**Minor-II/Specialization-II	3	3	-	-	3	25	25	50	100
** *List of minor/ specialization courses is mentioned on page no. 34-38*									

DISCIPLINE SPECIFIC ELECTIVE-II

COURSE CODE	COURSE NAME
TCS448	Reinforcement Learning
TCS484	Biometric Securities
TCS471	Statistical Data Analysis with R
TCS433	*Blockchain and its Applications (Through Swayam)
TCS465	*Linear Algebra (Through Swayam)
TCS463	*Discrete Mathematics (Through Swayam)

AUDIT COURSE: TOC 401: COMPETITIVE PROGRAMMING

NOTE:

1. The department will identify courses for Project-Based Learning (PBL) at the beginning of the semester. The implementation and evaluation of PBL courses will be carried out as per the SOP document. Each PBL course carries a total of 150 marks.
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.
3. *If the mentioned SWAYAM course is unavailable on the SWAYAM platform during the time of offering, the Departmental Committee will review and finalize a suitable alternative course available on the SWAYAM platform.

Graphic Era (Deemed to be University)

B.Tech. in Computer Science and Engineering (AI and ML)

Scheme of Teaching and Evaluation 2025

Outcome Based Education (OBE) and Choice Based Credit System (CBCS) as per NEP 2020

(Effective from the academic year 2025-26)

Semester V

COURSE MODULE					TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE				Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	NEP Component	AICTE Component									
TCS564	Natural Language Processing and Computer Vision	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS502	Operating Systems	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS503	Database Management Systems	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS511	Computer Networks	DSC	PCC	3	3	-	-	3	25	25	50	100
	Discipline Specific Elective-III	DSE	PEC	3	3	1	-	4	25	25	50	100
PCS564	Natural Language Processing and Computer Vision Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS503	DBMS Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS511(S)	OS and CN Lab	DSC	LC	1	-	-	2	2	25	25	50	100
XCS501	Career Skills-III	AEC	AEC	2	2	-	-	2	25	25	50	100
			Total	**20**								**900**

Mandatory Non-Graded Course												
HSS304	Indian Knowledge System	MNG	MC	2	2	-	-	2	-	-	100	100
									Qualified/ Non-Qualified			

Optional									
		TEACHING PERIODS				**WEIGHTAGE: EVALUATION**			
	Credits	**L**	**T**	**P**	**Contact Hr.**	**CIE**	**MSE**	**ESE**	**Total**
**Minor-III/Specialization-III	3	3	-	-	3	25	25	50	100
** *List of minor/ specialization courses is mentioned on page no. 34-38*									

DISCIPLINE SPECIFIC ELECTIVE- III

COURSE CODE	COURSE NAME
TCS548	Optimization for Deep Learning
TCS543	Knowledge Representation
TCS584	Foundation of Quantum Computing
TCS595	Security and Auditing
TCS552	Cloud Based Application Development and Management
TCS571	Big Data Visualization
TCS531	Communication models and protocols
TCS597(E)	Computer system security
TCS521	User Interface Design
TMA502	Computer Based Numerical and Statistical Techniques
TCS586	*Parallel Computer Architecture (Through Swayam)

NOTE:

1. The department will identify courses for Project-Based Learning (PBL) at the beginning of the semester. The implementation and evaluation of PBL courses will be carried out as per the SOP document. Each PBL course carries a total of 150 marks.
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.
3. *If the mentioned SWAYAM course is unavailable on the SWAYAM platform during the time of offering, the Departmental Committee will review and finalize a suitable alternative course available on the SWAYAM platform.

Graphic Era (Deemed to be University)

B.Tech. in Computer Science and Engineering (AI and ML)

Scheme of Teaching and Evaluation 2025

Outcome Based Education (OBE) and Choice Based Credit System (CBCS) as per NEP 2020

(Effective from the academic year 2025-26)

Semester VI

COURSE MODULE					TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE				Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	NEP Component	AICTE Component									
TCS601	Compiler Design	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS611	Software Engineering	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS666	Transformer Models and Applications	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS693	Full Stack Web Development	DSC	PCC	3	3	-	-	3	25	25	50	100
	Discipline Specific Elective-IV	DSE	PEC	3	3	1	-	4	25	25	50	100
PCS601	Compiler Design Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS666	Transformer Models and Applications Lab	DSC	LC	1	-	-	2	2	25	25	50	100
PCS693	Web Development Lab	DSC	LC	1	-	-	2	2	25	25	50	100
XCS601	Career Skills-IV	AEC	AEC	2	2	-	-	2	25	25	50	100
GP601	General Proficiency-III	SEC	SEC	1	-	-	-	-	100	-	-	100
			Total	**21**								**1000**

Optional									
		TEACHING PERIODS				**WEIGHTAGE: EVALUATION**			
	Credits	**L**	**T**	**P**	**Contact Hr.**	**CIE**	**MSE**	**ESE**	**Total**
**Minor-IV/Specialization-IV	3	3	-	-	3	25	25	50	100
** *List of minor/ specialization courses is mentioned on page no. 34-38*									

DISCIPLINE SPECIFIC ELECTIVE-IV

COURSE CODE	COURSE NAME
TCS665	Generative Adversarial Networks (GANs)
TCS645	AI in Creative Fields
TCS688	Quantum Machine Learning
TCS684	Information Retrieval
TCS685	Quantum Cryptography
TCS695	Database Security, Identity and Access Management
TCS651	Devops on cloud
TCS679(E)	Network and system security
TCS631	*Network Programming and Wireless Technologies (Through Swayam)
TCS641	*Virtual Reality (Through Swayam)
TCS661	*Computer Graphics (Through Swayam)
TCS663	*Applied Accelerated Artificial Intelligence (Through Swayam)

AUDIT COURSE: TOC601: COMPETITIVE PROGRAMMING

NOTE:

1. The department will identify courses for Project-Based Learning (PBL) at the beginning of the semester. The implementation and evaluation of PBL courses will be carried out as per the SOP document. Each PBL course carries a total of 150 marks.
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.

3. *If the mentioned SWAYAM course is unavailable on the SWAYAM platform during the time of offering, the Departmental Committee will review and finalize a suitable alternative course available on the SWAYAM platform.

Graphic Era (Deemed to be University)

B.Tech. in Computer Science and Engineering (AI and ML)

Scheme of Teaching and Evaluation 2025

Outcome Based Education (OBE) and Choice Based Credit System (CBCS) as per NEP 2020

(Effective from the academic year 2025-26)

Semester VII

COURSE MODULE					TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE				Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	NEP Component	AICTE Component									
TCS765	Large Language Models (LLMs)	DSC	PCC	3	3	-	-	3	25	25	50	100
TCS766	Multimodal AI	DSC	PCC	3	3	-	-	3	25	25	50	100
TRM701	Research Methodology and IPR	DSC	PCC	3	3	-	-	3	25	25	50	100
	Discipline Specific Elective-V	DSE	PEC	3	3	1	-	4	25	25	50	100
	Generic Elective-I	UOE	OEC	3	3	-	-	3	25	25	50	100
SCS701	Seminar on Industrial Interaction	PROJ	PROJ	4	-	-	-	-	-	-	100	100
CSP701	Major Project Phase I	PROJ	PROJ	3	-	-	6	6	50	-	50	100
			Total	**22**								**700**

Optional									
		TEACHING PERIODS				**WEIGHTAGE: EVALUATION**			
	Credits	**L**	**T**	**P**	**Contact Hr.**	**CIE**	**MSE**	**ESE**	**Total**
**Minor-V/Specialization-V	3	3	-	-	3	25	25	50	100
** *List of minor/ specialization courses is mentioned on page no. 34-38*									

DISCIPLINE SPECIFIC ELECTIVE-V

Course Code	**Course Name**
TCS745	Advanced GANs
TCS785	Generative AI and Prompt Engineering
TCS737	UI/UX Design
TCS738	Object-Oriented Analysis and Design
TCS743	Evolutionary Computation
TCS731	Computer Forensics
TCS761	Cloud Infrastructure Services
TCS726(E)	Business Intelligence
TCS756	Human-Computer Interaction
TCS723	Distributed Systems
TCS799	Software Verification, Validation and Testing
TCS734	Robotic Process Automation Design and Development
TCS795	Cryptography and Network Security
TCS722	*Data warehousing and data mining (Through Swayam)
TCS732	*Web Mining (Through Swayam)

NOTE:

1. The department will identify courses for Project-Based Learning (PBL) at the beginning of the semester. The implementation and evaluation of PBL courses will be carried out as per the SOP document. Each PBL course carries a total of 150 marks.

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.
3. *If the mentioned SWAYAM course is unavailable on the SWAYAM platform during the time of offering, the Departmental Committee will review and finalize a suitable alternative course available on the SWAYAM platform.

Graphic Era (Deemed to be University)

B.Tech. in Computer Science and Engineering (AI and ML)

Scheme of Teaching and Evaluation 2025

Outcome Based Education (OBE) and Choice Based Credit System (CBCS) as per NEP 2020

(Effective from the academic year 2025-26)

Semester VIII

COURSE MODULE					TEACHING PERIODS				WEIGHTAGE : EVALUATION			
COURSE				Credits	L	T	P	Contact Hr.	CIE	MSE	ESE	Total
Code	Title	NEP Component	AICTE Component									
DM001	Disaster Management	VAC	VAC	2	2	-	-	2	25	25	50	100
	Discipline Specific Elective-VI	DSE	PEC	3	3	1	-	4	25	25	50	100
	Generic Elective-II	UOE	OEC	3	3	-	-	3	25	25	50	100
CSP801	Major Project Phase II	PROJ	PROJ	6	-	-	12	12	-	-	100	100
CSC801	Comprehensive Viva-Voce	PROJ	PROJ	2	-	-	-	-	-	-	100	100
GP801	General Proficiency-IV	SEC	SEC	1	-	-	-	-	100	-	-	100
			Total	**17**								**600**

Optional									
		TEACHING PERIODS				**WEIGHTAGE: EVALUATION**			
	Credits	**L**	**T**	**P**	**Contact Hr.**	**CIE**	**MSE**	**ESE**	**Total**
**Minor-IV/Specialization-IV	3	3	-	-	3	25	25	50	100
*** List of minor/ specialization courses is mentioned on page no. 34-38*									

DISCIPLINE SPECIFIC ELECTIVE - VI

Course Code	Course name
TCS842	Recent Trends in AI
TCS848	Generative AI Model Deployment & Cloud Integration
TCS881	Advanced Computer Vision
TCS801	Mobile Computing
TCS822	Mobile Applications Development
TCS823	Multimedia Systems and Data Compression
TCS826	Unix Systems Programming
TCS851	Storage Networks
TCS852	Pattern Recognition
TCS855	Agile Software Engineering
TCS857	Game Theory
TCS821	Soft Computing (Through Swayam)
TCS825	Computational Geometry (Through Swayam)

NOTE:

1. The department will identify courses for Project-Based Learning (PBL) at the beginning of the semester. The implementation and evaluation of PBL courses will be carried out as per the SOP document. Each PBL course carries a total of 150 marks.

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.
3. *If the mentioned SWAYAM course is unavailable on the SWAYAM platform during the time of offering, the Departmental Committee will review and finalize a suitable alternative course available on the SWAYAM platform.

Department of Computer Science and Engineering (AI and ML)

Honours with Specialization

Honours with Specialization in Generative AI					
Semester	**Course Code**	**Course Name**	**SWAYAM Course Name**	**Credits**	**Total No. Students may opt for this course**
3	HCS341	Applied Linear Algebra in AI and ML	Applied Linear Algebra in AI and ML	3	**30**
4	HCS442	Generative AI for Everyday Life	Generative AI for Everyday Life	3	
5	HCS542	Programming with Generative AI	Programming with Generative AI	3	
6	HCS642	Generative AI and Large Language Models	Generative AI and Large Language Models	3	
7	HCS741	Affective Computing	Affective Computing	3	
8	HCS841	GPU Architectures And Programming	GPU Architectures And Programming	3	
			Total Credits	**18**	

Honours with Specialization in Cyber Security					
Semester	**Course Code**	**Course Name**	**SWAYAM Course Name**	**Credits**	**Total No. Students may opt for this course**
3	HCS361	Basic Linear Algebra	Basic Linear Algebra	3	**30**
4	HCS461	Cyber Security, Tools, Techniques and Counter Measures	Cyber Security, Tools, Techniques and Counter Measures	3	
5	HCS561	Foundations of Cyber Physical Systems	Foundations of Cyber Physical Systems	3	
6	HCS661	Information Security and Cyber Forensics	Information Security and Cyber Forensics	3	
7	HCS761	Privacy and Security in Online Social Media	Privacy and Security in Online Social Media	3	
8	HCS861	Secure Computation: Part I	Secure Computation: Part I	3	
			Total Credits	**18**	