AC– 11-03-2025
Item No. 05

Approved by the BoS in Information Technology on 05-03-2025 Item No. 05

As Per NEP 2020

Tolani College of Commerce (Autonomous)

Knowledge is Supreme

Title of the Course: Generative Artificial Intelligence

Programme: Bachelor of Science (Information Technology) Semester VI

Syllabus for 2 credits

From the academic year-2025-2026

Name of the Course: Generative Artificial Intelligence

Sr. No.	Heading	Particulars
1	**Description the course :**	Generative AI models learn from existing data and then generate new data with similar characteristics. These models can often generate output in response to specific prompts. This can be used to create conversations, stories, music, audio, and videos.
2	**Vertical:**	mandatory
3	**Type:**	Theory
4	**Credit**:	2 credits
5	**Hours Allotted:**	30 Hours
6	**Marks Allotted**:	Total : 50 Marks Practical Evaluation: 20 Marks Semester-End: 30 Marks
7	**Course Objectives**: 1. Understanding how large language models (LLMs) work and their role in generative AI 2. Learning how to evaluate your critical thinking skills and improve your interactions with generative AI.	
8	**Course Outcomes**: 1. Learners should grasp the principles behind generative models, including types like GANs (Generative Adversarial Networks) 2. Students should be able to apply generative AI techniques to create content, such as images, text, or music, and understand the practical implications and limitations of these applications.	

9	**Modules**:-
	Module 1: Introduction and Generative Artificial Intelligence (15 hours)
	1.1 Understanding Generative AI • Definition and Overview of Generative AI • Types of Generative Models (e.g., GANs, VAEs, autoregressive models) • Applications of Generative AI in various fields (e.g., art, music, text generation) 1.2 Fundamental Concepts • Basics of Machine Learning and Deep Learning • Neural Networks: Architecture and Functioning • Introduction to Probability and Statistics in AI 1.3 Generative Adversarial Networks (GANs) • Architecture of GANs: Generator and Discriminator • Training GANs: Loss Functions and Optimization Techniques • Variants of GANs (e.g., DCGAN, CycleGAN, StyleGAN) 1.4 Variational Autoencoders (VAEs) • Introduction to VAEs and their Architecture • Loss Functions and Training Process • Applications of VAEs in Image and Data Generation 1.5 Ethics and Bias in Generative AI • Understanding Ethical Considerations in AI • Bias in Data and Model Outputs
	• Responsible AI Development and Deployment **Module2: Practical Applications and Implementation (15 hours)**
	2.1 Natural Language Processing (NLP) • Overview of NLP and Its Importance • Text Generation Models (e.g., GPT, BERT) • Hands-on Project: Building a Text Generation Model 2.2 Image Generation and Manipulation • Introduction to Image Processing Techniques • Hands-on Project: Using GANs for Image Generation • Style Transfer and Image Enhancement Techniques 2.3 Audio and Video Generation • Basics of Audio Processing • Generating Music and Sound Effects with AI • Introduction to Video Generation Techniques 2.4 Tools and Frameworks for Generative AI • Overview of Popular Libraries (e.g., TensorFlow, PyTorch, Keras) • Setting Up Development Environments for Generative AI • Hands-on Sessions: Building Projects Using Libraries 2.5 Future Trends in Generative AI • Current Research Trends and Innovations • The Role of Generative AI in Industries (e.g., entertainment, healthcare, marketing) • Discussion on Future Challenges and Opportunities

10	**Reference Books:** 1) **Author/s:** David Foster **Title** : "Generative Deep Learning: Teaching Machines to Paint, Write, Compose, and Play", **Publisher** : O'Reilly Media, **Edition** : 1st Edition (2019). 2) **Author/s:** Rafael Valle **Title** "Hands-On Generative Adversarial Networks with Keras: Create Generative Adversarial Networks using Keras", **Publisher** : Packt Publishing , **Edition** : 1st Edition (2019).

11	**Internal Continuous Assessment: 20%**	**Semester End Examination: 30%**
12	**Continuous Evaluation through:**	Assignments/Presentations/MCQ test

13 **Format of Question Paper:**

Scheme of Evaluation Pattern

Table 1A: Scheme of Continuous Evaluation (CE/Practical) Scheme of Evaluation Pattern

Sub-components	Maximum Marks	Conditions for passing
1) Presentation/assignment	10	A learner must be present for each of the sub-components.
2) MCQ based test	10	
Total	20	

Table 1B: Scheme of Semester End Examination (SEE) Evaluation
Question Paper Pattern for Semester End Examination (SEE)
Maximum Marks: 30 **Duration: I Hrs.**

Question Number		Nature of Questions	Maximum Marks
1)		**Attempt any Three**	15
	a)		
	b)		
	c)		
	d)		
	e)		
2)		**Attempt any Three**	15
	a)		

	Note: All		b)			
			c)			
			d)			
			e)			
		questions are compulsory. Each question has an internal choice.				