

सत्यमेव जयते



organised by

Department of Computer Applications

National Institute of Technology Tiruchirappalli- 620015, Tamil Nadu, India

DATE

25th Aug - 29th Aug 2025

Generative AI: Foundations, GANs, VAEs, and Real-World Image Generation Techniques This course provides a comprehensive introduction to Generative AI, focusing on its core concepts, models, and applications. Participants will explore foundational topics such as Artificial Intelligence (AI), Machine Learning (ML), and Deep Learning (DL) and how these techniques enable generative models like GANs (Generative Adversarial Networks) and VAEs (Variational Autoencoders).

The course covers both theoretical aspects and hands-on practical sessions where participants will build and train models such as Basic GANs, CycleGANs, StyleGANs, and SRGANs for high-resolution image generation. Additionally, learners will delve into the implementation of advanced architectures like Wasserstein GAN (WGAN) and techniques for enhancing image quality through super-resolution GANs (SRGANs).

By bridging theory and practice, the course equips participants with the necessary tools to implement cutting-edge generative AI models and apply them in real-world use cases such as image-to-image translation, super-resolution image generation, and latent space exploration. Course participants will learn these topics through lectures and hands-on experiments. Additionally, case studies and assignments will be shared to stimulate research motivation among participants.

E R V E

- Understand the fundamentals of AI, ML, and Deep Learning and their role in generative models.
- Gain expertise in Generative Adversarial Networks (GANs) and Variational Autoencoders (VAEs).
- Learn to implement different types of GANs, including Cycle GAN, StyleGAN, and SRGAN.
- Explore image-to-image translation and high-resolution image generation techniques.
- Develop hands-on skills for building, training, and optimizing generative AI models.
- Apply generative AI to real-world challenges and research problems.

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MODULES

Overview of AI, ML, Deep Learning, Generative AI and its Applications

Basic GAN

Conditional GANs (cGAN), CycleGAN and StyleGAN for High-Resolution Image Generation

4

Introduction and Implementation of Variational Autoencoders (VAEs)

Advanced GAN and SRGAN

WHO CAN ATTEND ?

- You are a student eager to explore cutting-edge AI technologies, build generative models, and gain hands-on experience in deep learning.
- you are an Industry professional and working in AI, computer vision, or data science and want to integrate generative models into real-world applications.
- you are a Researcher looking to deepen your understanding of generative AI, explore novel architectures, and contribute to advancements in the field.
- you are an educator or faculty member interested in incorporating generative AI concepts into curricula or guiding students in AI
- you are passionate about AI and want to explore the creative and technical aspects of generative models for applications like art, media, or scientific simulations.

REGISTRATION DETAILS

Click Here

LECTURE SCHEDULE



HOW TO REACH NIT, TIRUCHIRAPPALLI

NITT is located in the Tanjore Main Road, in National Highway 83 in between BHEL and Thuvakudi. https://maps.app.goo.gl/cDH8jHDzsCmNig2y5

E C Τ E

Dr. Amudhavel Jayavel

Currently working as a Senior Lecturer at De Montfort University, he is a experienced researcher and educator in the field of Computer Science, specialising in Generative Adversarial Networks (GANs), Computer Vision, Artificial Intelligence, Analytics. He holds a Ph.D. in Computer Science and Engineering. He has over fifteen years of research and teaching experience, focusing on the development and deployment of deep learning algorithms for advanced image enhancement, econstruction techniques. His expertise extends to applying Generative Adversarial Networks (GANs) for image resolution enhancement, noise reduction, and image-to-image translation. His work in combining optics and deep learning for image restoration has led to significant advancements in super-resolution and GAN-based image generation. In addition to research, he has extensive experience teaching undergraduate and graduate courses on topics such as Generative Adversarial Networks.

Dr. R. Vishnu Priya

Assistant Professor in the Department of Computer Applications at NIT Tiruchirappalli. Her research focuses on Machine Learning, Deep Learning, Image Processing, Gen AI and NLP





Dr. Domnic S

Professor and HOD in the Department of Computer Applications at NIT Tiruchirappalli. His research interests are Machine Learning, Deep Learning, Image Processing.



D E T A Ι L S

COURSE COORDINATOR

- Dr. Vishnu Priya R
- **9486072557**
- vishnupriya@nitt.edu
- Dr. Domnic S
- 🖂 domnic@nitt.edu

REGISTER FOR THE COURSE BELOW



Last date for Course Registration: 22nd August 2025

<u>Fees (includes GST 18%)</u> Participants from abroad (online): US\$50 Industry/Research personnel (online): Rs.1,000/-Faculty from Academic Institutions (online): Rs. 1,000/-Research Scholar (online): Rs 500/-Students (online): Rs 500/-

> Last date for Fee Payment: 22nd August 2025