COURSE: ETCCCP105 | ASSIGNMENT 03

ARTIFICIAL INTELLIGENCE

Emerging Technologies & Career Pathways

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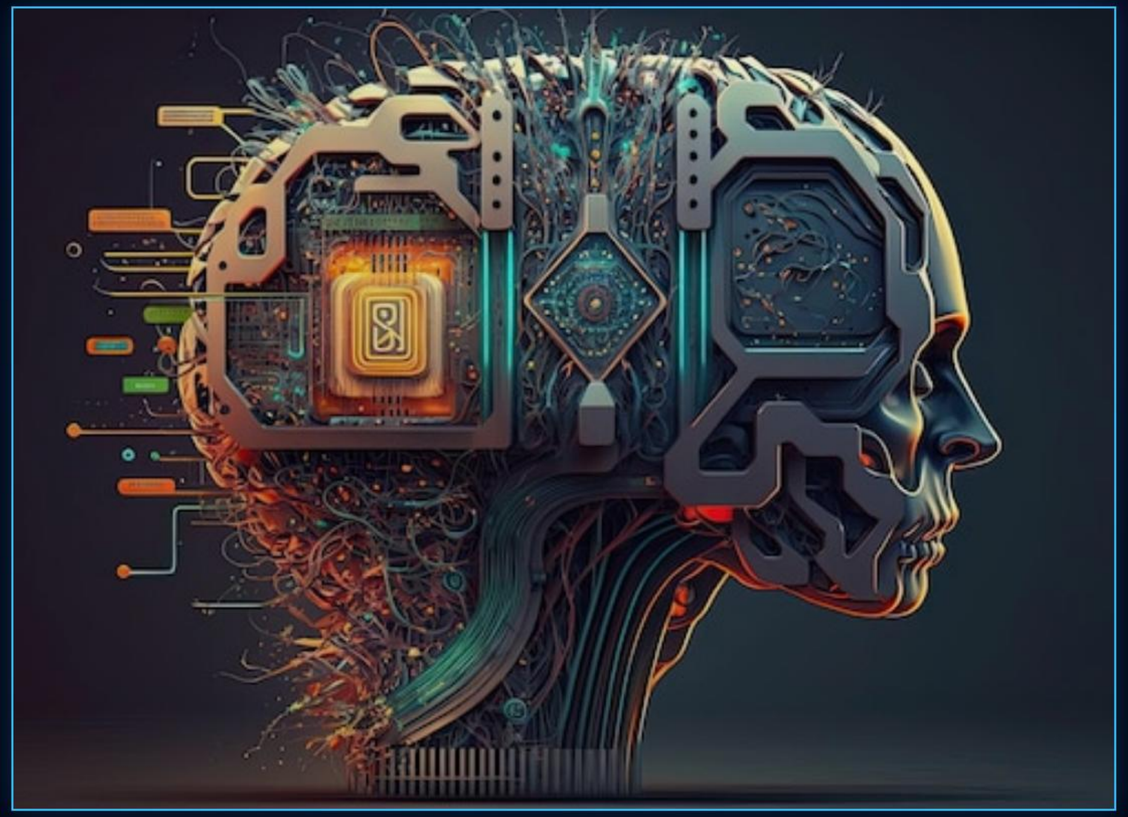
PART A: DOMAIN INTRODUCTION

WHAT IS ARTIFICIAL INTELLIGENCE?

Artificial Intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems. It encompasses learning, reasoning, and self-correction.

> "AI is not just a technology; it is a fundamental shift in how we process information and solve complex problems, moving from explicit programming to learned patterns."



KEY TECHNOLOGIES & TOOLS

MACHINE LEARNING

Algorithms that enable computers to learn from data without being explicitly programmed.

Tools: Scikit-learn, AutoML

DEEP LEARNING

Neural networks with many layers that analyze various factors of data. Powering GenAI.

Tools: TensorFlow, PyTorch

ROBOTICS & NLP

Integrating AI with physical hardware and understanding human language.

Applications: Boston Dynamics, ChatGPT

GLOBAL USE CASE

AUTONOMOUS MOBILITY

Companies: Tesla, Waymo

Autonomous vehicles utilize a fusion of Computer Vision, LiDAR, and Reinforcement Learning to navigate complex environments without human intervention.

Key Impact: Reduction in traffic accidents caused by human error, optimization of logistics, and the creation of "Mobility-as-a-Service" (MaaS) ecosystems globally.

INDIAN USE CASE: HEALTHCARE

NIRAMAI HEALTH ANALYTIX

Technology: Thermalytix (Thermal Imaging + AI)

- **Problem:** Low rates of breast cancer screening in India due to privacy concerns and cost of mammography.
- **Solution:** A non-invasive, radiation-free, privacy-sensitive screening solution.
- **Impact:** Deployed in rural screening camps, enabling early detection for thousands of women who previously lacked access to affordable diagnostics.

PART B: CAREER MAPPING - ROLES & SKILLS

JOB ROLE	KEY SKILLS REQUIRED	INDUSTRY DEMAND (2025)
Machine Learning Engineer	Python, TensorFlow, MLOps, Data Structures	Very High - Critical for deploying models in production.
Data Scientist	Statistics, SQL, Data Visualization, R/Python	High - Essential for actionable business insights.
AI Ethicist / Policy Analyst	Legal frameworks, Bias mitigation, Sociology	Growing - Crucial for responsible AI adoption.
Computer Vision Engineer	OpenCV, Image Processing, Deep Learning	High - Driven by healthcare & automotive sectors.

PART B: REFLECTION WRITING

ALIGNMENT & CURRENT SKILLS

This domain aligns perfectly with my goal of using technology to solve real-world problems. The ability of AI to process vast amounts of data offers unique solutions in healthcare and finance.

Current Skills:

- Proficiency in Python programming basics.
- Strong foundation in logical reasoning and mathematics (Calculus).
- Experience with data visualization libraries (Matplotlib).

FUTURE DEVELOPMENT

To transition into a Machine Learning Engineer role, I need to bridge the gap between academic theory and practical application.

Skills to Develop:

- Advanced proficiency in frameworks like **PyTorch** and **TensorFlow**.
- Understanding of **Neural Network architectures** (CNNs, RNNs).
- Hands-on experience with cloud AI platforms (AWS SageMaker).

QUESTIONS?

Thank you for your attention.

IMAGE SOURCES

https://img.freepik.com/premium-photo/futuristic-digital-brain-powered-by-artificial-intelligence-is-revolutionary-concept-that-offers-limitless-possibilities-solving-complex-problems-generated-by-ai_727385-1763.jpg

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