AI & Machine Learning Workshop for Engineering Students

Welcome to Krysha Academy's comprehensive 3-day workshop designed specifically for engineering students who want to explore the exciting world of AI and Machine Learning. This workshop combines theoretical knowledge with hands-on practice, guiding you from basic concepts to creating your own AI applications. No prior AI experience is required—just bring your enthusiasm, a laptop, and basic programming knowledge!

Workshop Overview & Learning Objectives

Target Audience

- Engineering college students
- Basic computer knowledge required
- No prior AI/ML experience necessary

Prerequisites

- Laptop with internet connection
- Basic understanding of programming
- Gmail account for accessing AI tools
- Enthusiasm to learn!

By the end of this intensive workshop, you will gain practical skills in AI and machine learning that can immediately enhance your academic projects and future career prospects. The workshop is structured to provide a balanced mix of theory and application, with plenty of hands-on activities to reinforce your learning.

1

Understand AI Fundamentals

Grasp core AI concepts, terminology, and the differences between AI, ML, and Generative AI

2

Master Prompt Engineering

Learn techniques to effectively communicate with AI tools like ChatGPT to get optimal results

3

Build AI Applications

Create practical AI applications including a VTU Syllabus Q&A bot using RAG technology

4

Explore Career Opportunities

Discover regional and global career paths in the rapidly expanding AI industry

Day 1: AI Fundamentals & Practical Applications

Morning Sessions

9:30-10:00	Welcome & Introduction
10:00-11:00	Understanding AI - The Basics
11:15-12:00	AI vs ML vs GenAI
12:00-12:45	Setup Python Jupyter Notebook

Afternoon Sessions

1:45-3:00	Introduction to Machine Learning
3:15-4:30	ML Libraries & Real-World Case Study
4:30-5:00	Reflection & Day 1 Wrap-up

Day 1 focuses on building a strong foundation in AI concepts. You'll begin with understanding what AI is and how it affects our daily lives, distinguishing between different types of AI, and setting up your development environment. The afternoon sessions introduce machine learning concepts and libraries through practical examples, culminating in a healthcare prediction system case study.

The day concludes with a fun knowledge-sharing session and quiz to reinforce learning, plus the "Prompt Ninja of the Day" competition to recognize outstanding participants.

Machine Learning Fundamentals

Data Collection

Gathering relevant information for the AI to learn from

Training

Teaching the model to recognize patterns in the data

Deployment

Implementing the model to solve real-world problems

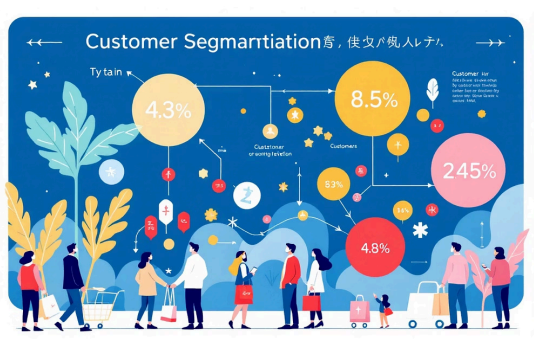
Evaluation

Testing the model's performance against new data

Types of Machine Learning

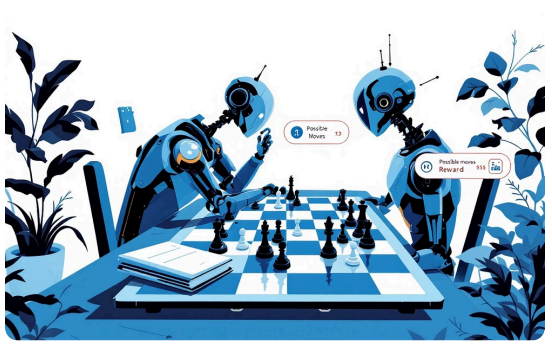
Supervised Learning

Learning with labeled examples (like a teacher). Example: Email spam detection where the system learns from pre-classified emails.



Unsupervised Learning

Finding hidden patterns without labeled examples. Example: Customer grouping for targeted marketing campaigns.



Reinforcement Learning

Learning through trial and error with rewards. Example: Game-playing AI that improves through practice.

Day 2: LLMs & Prompt Engineering

Morning Sessions

9:30-10:00	Recap & Enter into LLM World
10:00-10:30	LLMs and How They Work
10:30-11:00	ChatGPT Basics
11:15-12:45	Prompt Engineering

Afternoon Sessions

1:45-3:00	AI Tools in Action
3:15-4:30	Hands-on with AI Tools
4:30-5:00	Reflection & Day 2 Wrap-up

Day 2 dives into the exciting world of Large Language Models (LLMs) and how to effectively communicate with them. You'll learn about popular AI models like GPT, BERT, Claude, and Gemini before mastering the art of prompt engineering—a crucial skill for getting the best results from AI tools.

The 4 Qualities of Effective Prompts

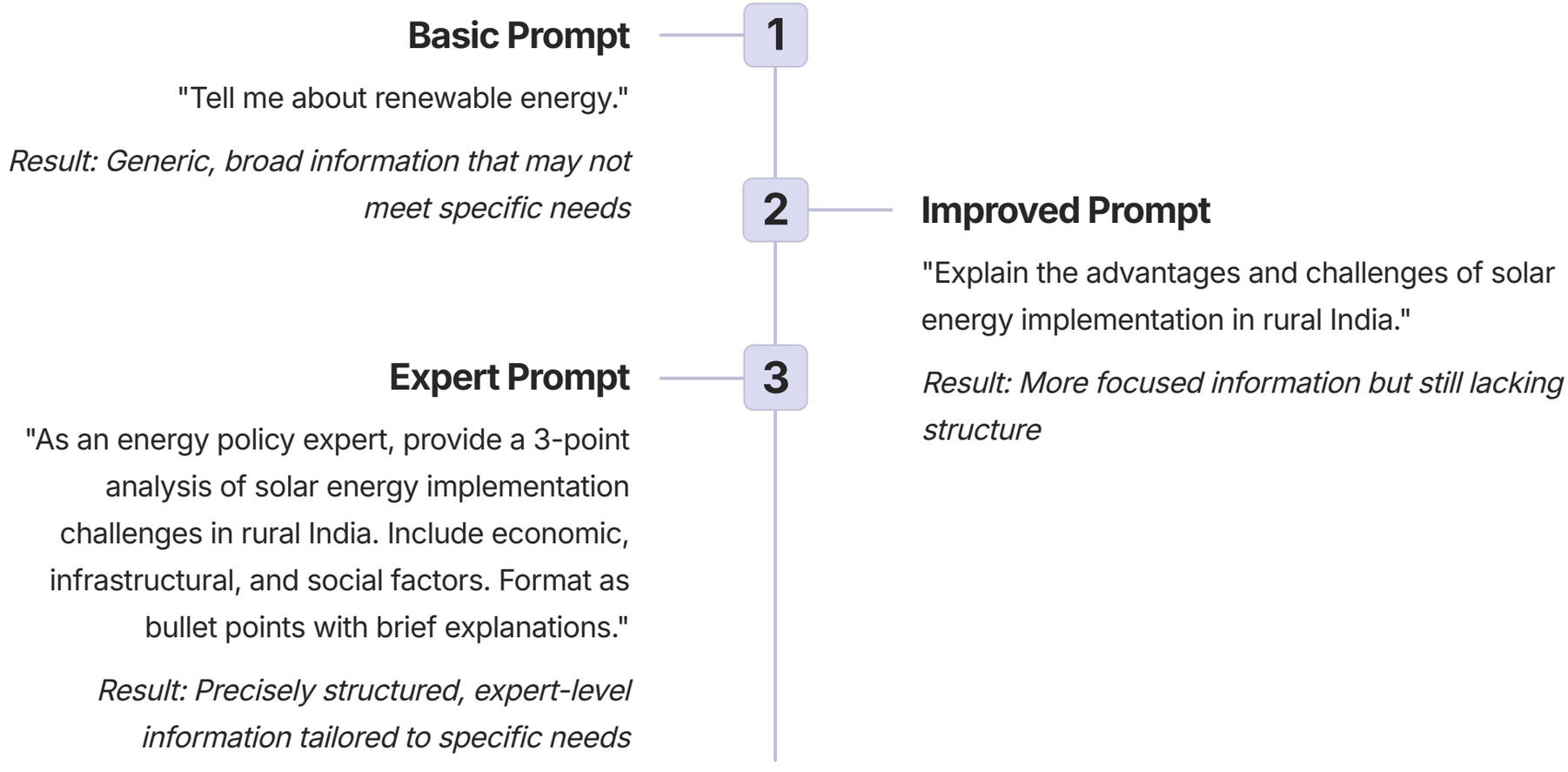
- **Clarity** - Be precise about what you want
- **Specificity** - Include relevant details
- **Instruction** - Give explicit directions
- **Context** - Provide necessary background

Advanced Techniques

- **Zero-shot prompting** - "Explain photosynthesis in simple terms"
- **Few-shot prompting** - Providing examples before your request
- **Chain-of-thought** - "Solve this step-by-step and show your work"

The afternoon focuses on practical applications with tools like NotebookLLM and Gamma, culminating in a team presentation project that lets you apply your newly acquired prompt engineering skills.

Prompt Engineering Examples



> "The difference between a good AI outcome and a great one often lies not in the AI itself, but in how effectively you communicate with it through prompts."

Effective prompt engineering is about guiding the AI to produce exactly what you need. It's a skill that improves with practice and can dramatically enhance your productivity across various applications. During the hands-on sessions, you'll refine these techniques through real-world exercises.

Day 3: Advanced Applications & Future Opportunities

Morning Sessions

9:30-10:00	Recap & Emerging Trends
10:00-11:00	GitHub Copilot - Your AI Coding Partner
11:15-12:45	Building Your First AI Application

Afternoon Sessions

1:45-3:00	Responsible AI & Understanding Bias
3:15-4:15	AI in the Real World - Demo Sessions
4:15-5:00	Looking Forward - Careers & Closing

The final day focuses on practical applications and ethical considerations. You'll learn how to use GitHub Copilot to enhance your programming efficiency and build a VTU Syllabus Q&A bot using Retrieval Augmented Generation (RAG) technology—a powerful technique that combines the language capabilities of LLMs with your own custom data.

Upload Syllabus Documents

Prepare and format the VTU syllabus data for the AI to access

Set Up RAG System

Configure the system to retrieve relevant information from your documents

Test with Sample Questions

Ask various questions to evaluate the system's accuracy and response quality

Improve Responses

Refine the system based on testing results to enhance performance

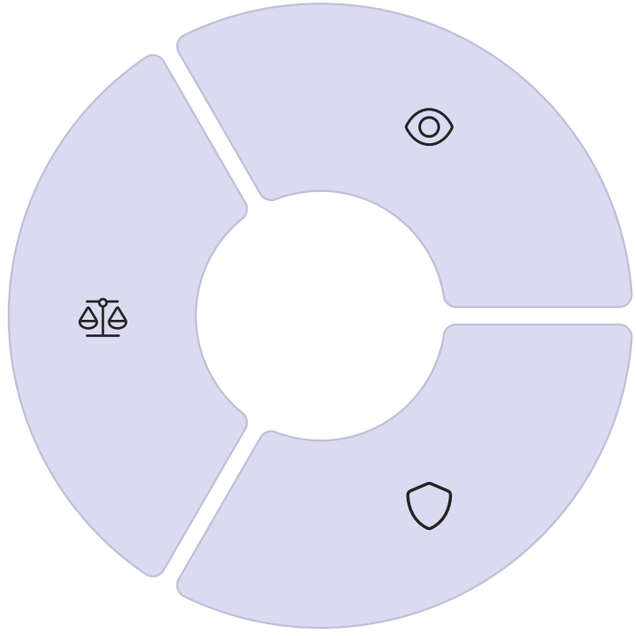
The afternoon sessions explore responsible AI practices and showcase real-world applications across various industries. The workshop concludes with career guidance, certificate distribution, and resources for continuing your AI journey.

Responsible AI & Ethical Considerations

As AI becomes increasingly integrated into society, understanding its ethical implications is crucial for any professional in the field. Day 3 includes a comprehensive session on responsible AI practices based on international standards like ISO/IEC 42001.

Fairness

AI systems should treat all individuals equitably, without discrimination based on protected attributes like gender, race, or socioeconomic status.



Transparency

The decision-making process of AI systems should be explainable and understandable to users and stakeholders.

Accountability

Clear responsibility for AI outcomes must be established, with mechanisms for redress when systems cause harm.

⚠ **Common AI Issues to Watch For:**

- **Hallucinations:** AI generating false or misleading information
- **Bias:** Systems reflecting or amplifying societal prejudices
- **Privacy concerns:** Improper handling of sensitive data

Through hands-on exercises, you'll learn to identify these issues in real AI systems and develop strategies to mitigate them. This critical thinking ability will make you a more responsible and effective AI practitioner.

AI Industry Applications

Healthcare

- Medical image analysis for disease detection
- Drug discovery acceleration
- Personalized treatment recommendations
- Remote patient monitoring systems

Finance

- Fraud detection and prevention
- Algorithmic trading systems
- Customer risk assessment
- Personalized financial advice

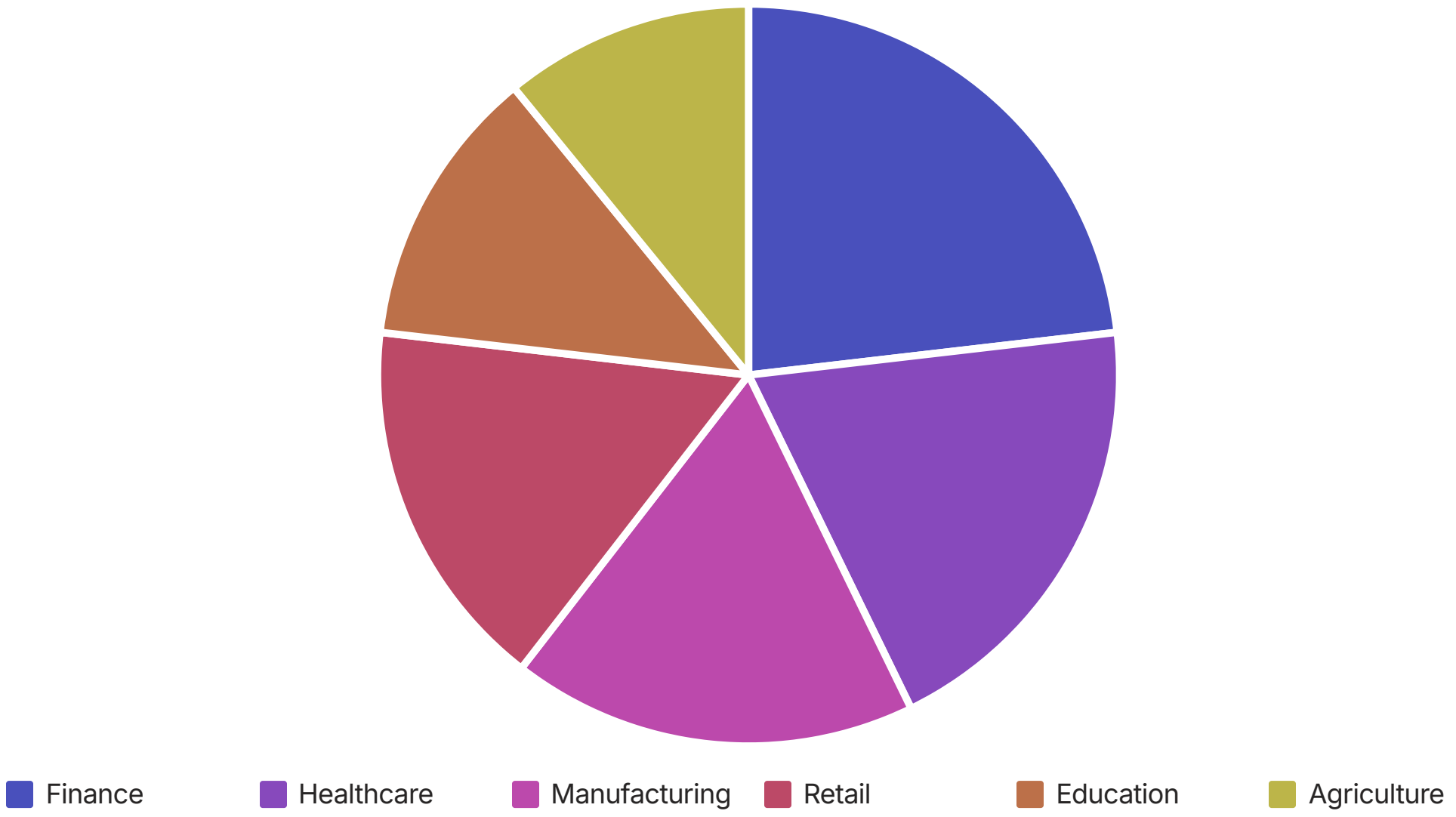
Education

- Personalized learning paths
- Automated assessment and feedback
- Educational content generation
- Administrative task automation

Agriculture

- Crop health monitoring via drones
- Precision farming recommendations
- Yield prediction and optimization
- Supply chain optimization

During the industry demo sessions on Day 3, you'll see professional AI tools in action and learn about success stories from both established companies and innovative startups. These real-world examples will help you understand how the concepts you've learned are being applied to solve complex problems across different sectors.



The chart above shows the relative AI implementation rates across different industries, highlighting where adoption is strongest and where significant growth opportunities exist for professionals entering the field.

AI Career Opportunities & Next Steps

Regional Opportunities in India

- AI/ML developer roles in IT services companies
- AI research positions at R&D centers
- Data science roles in banking and finance
- AI-driven startups in major tech hubs
- Freelance AI development and consulting

Global Opportunities

- Remote AI engineering positions
- International research collaborations
- Advanced degree programs abroad
- AI roles in multinational corporations
- Open-source AI project contributions

As you complete this workshop, remember that this is just the beginning of your AI journey. The field is evolving rapidly, offering diverse career paths and opportunities for continuous learning and growth.

Join Our Community

Connect with fellow participants and instructors through the WhatsApp group for ongoing support and knowledge sharing.

Attend Monthly Meetups

Participate in our virtual meetups to stay updated on the latest AI developments and share your progress.

Build Your Portfolio

Apply what you've learned to create AI projects that showcase your skills to potential employers.

Workshop Completion Benefits:

- Digital certificate of completion
- Prompt Engineering Cheat Sheet
- Curated resource list for continued learning
- Access to project mentoring from industry professionals

Thank you for your active participation throughout this workshop. We look forward to seeing how you apply these AI skills to solve real-world problems and advance your careers!