

AI (XI) – Half-Syllabus (2025)

SHORT TEST SYLLABUS

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Unit 2: Introduction and State of the Art of AI, NLP, and Potential Use of AI

(i) Brief History and Primary Elements of AI

Core Components of AI

- Machine Learning (ML): Definition and basic concepts
- Deep Learning (DL) and Neural Networks: Overview and architecture

Applications of ML and DL

- Image recognition and processing
- Computer vision
- Speech recognition
- Information Retrieval (IR) using search engines

(ii) Domain of Natural Language Processing (NLP)

Overview of NLP

- Definition and significance of NLP in AI

Key Tasks in NLP

- Text understanding and semantic analysis
- Text generation and content creation

Common Applications of NLP

- Machine translation (e.g., Google Translate)
- Question answering systems (e.g., Chatbots)
- Dialogue systems (e.g., Siri, Alexa)
- Internet search categories:
 - Navigation searches (e.g., LinkedIn, YouTube)

- Informational searches (e.g., learning new topics)
- Transactional searches (e.g., purchasing, signing up)
- Investigative searches (e.g., top-rated media)
- Voice-based search interfaces

(iii) Potential Use of AI in Various Domains

Word Processing Systems and Smart Devices

- AI-powered features in smartphones (e.g., predictive text, voice typing)

E-commerce and Online Platforms

- AI in recommendation systems and personalized shopping experiences
- Use in web-based auction sites and scanner machines

Social Networking and Digital Communication

- AI algorithms in content delivery and user engagement

(iv) AI and Society

Social Benefits of AI

- Healthcare:** Improved diagnostics, personalized treatment plans, enhanced patient care

- Transportation:** Autonomous vehicles, intelligent transport management systems

- Disaster Prediction:** AI in early warning systems and emergency response

- Agriculture:** Precision farming, crop health monitoring, and yield prediction

Unit 3: Mathematics for AI

(ii) Vectors and its applications

Vector arithmetic