

UNIVERSITY OF DELHI

Certificate Course

on

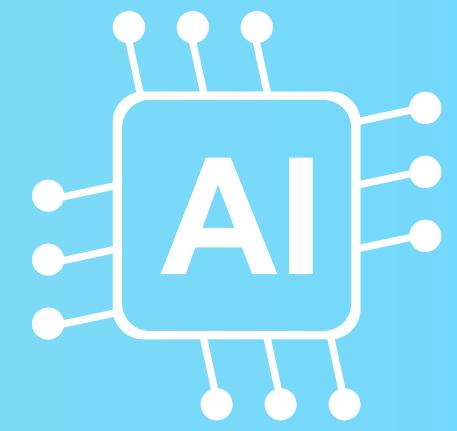
Applications of Artificial Intelligence in Health Sciences



Enroll Now Before the Batch Fills Up

15-Week Program | 60 Learning Hours

Batch Size: 50 | Level: Basic | Mode: Online



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Eligibility Criteria

Bachelor's Degree from a recognized University, at least equivalent to National Higher Education Qualifications Framework (NHEQF) Level 5.5, with recommended basic proficiency in Mathematics. The degree must be earned in any one of the following disciplines:

- Computer Science/ Information Technology
- Engineering
- Mathematics / Statistics
- Biotechnology
- Bioinformatics
- Medicine (MBBS), Nursing, or Pharmacy
- All areas of Life Sciences/ Pharmacy

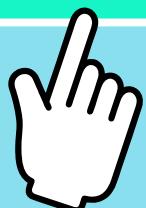
Applicability of the Course

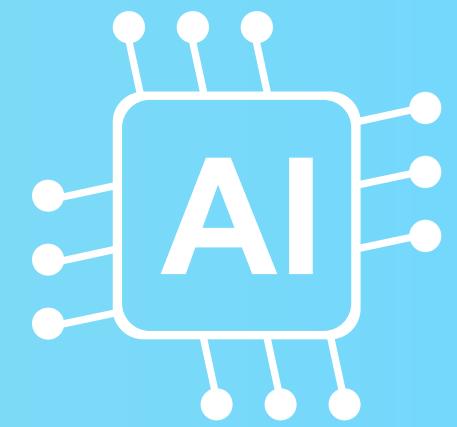
The course is highly applicable to students and professionals seeking to bridge computational techniques with real-world health challenges. With a focus on diagnostics, prognosis, imaging, drug discovery, and clinical NLP, the course prepares learners to get hands-on with multi-source healthcare data such as EHR, medical images, genomic profiles, and clinical text. It offers practical training in state-of-the-art AI frameworks, deep learning models, and bioinformatics tools, enabling participants to develop, evaluate, and interpret medical AI systems responsibly. The interdisciplinary design makes it suitable for graduates from Computer Science, Engineering, Life Sciences (all branches), Medicine, and related fields, empowering them to contribute to evidence-based clinical decision support, personalized medicine, and innovative digital health solutions. Learners also gain insights into the ethical, regulatory, and societal considerations that are critical to the safe deployment of AI in healthcare settings.

Course Objectives

This course aims to provide a comprehensive introduction to the applications of Artificial Intelligence in health sciences. It equips students with the skills to handle diverse healthcare data, build and evaluate AI models for diagnostics, prognosis, imaging, drug discovery, and clinical NLP. The course also emphasizes ethical, regulatory, and interpretability aspects of AI in healthcare, fostering interdisciplinary problem-solving and responsible innovation.

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Modules

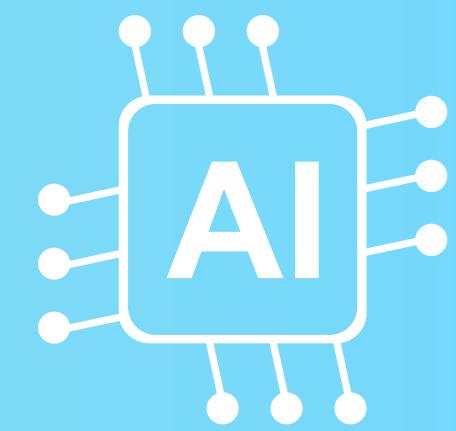
- **Module 1: Introduction to AI in Healthcare**
- **Module 2: Introduction to Bioinformatics and Multi-Omics**
- **Module 3: Machine Learning Foundations in Medical Sciences**
- **Module 4: Medical Imaging and Data Handling**
- **Module 5: Deep Learning and CNNs for Medical Image Analysis**
- **Module 6: AI in Drug Discovery and Cheminformatics**
- **Module 7: Natural Language Processing in Healthcare**
- **Module 8: Ethics, Regulation, and Future of AI in Medicine**

Each Module will be augmented with hands on training appropriate through tools

Assessment Method

Continuous evaluation through:

1. **MCQ tests and assignments on completion of each module by the instructor (to be submitted to the Course coordinator)**
2. **Seminar presentations, etc.**



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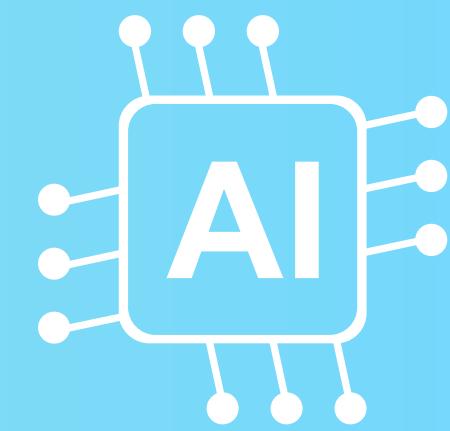
Teaching Learning Outcomes

On completing this course, the students will be able to:

- Identify and describe the role, opportunities, and limitations of AI in various healthcare applications (diagnostics, prognosis, image analysis, drug discovery, NLP).
- Acquire, preprocess, and integrate multi-source healthcare data, including structured (EHR), unstructured (text), imaging, and genomic datasets.
- Apply machine learning and deep learning techniques for classification, regression, segmentation, and survival analysis tasks on medical datasets.
- Develop and evaluate medical AI models using frameworks like Scikit-learn, TensorFlow, PyTorch, BioBERT, and DeepChem with appropriate performance metrics.
- Design end-to-end pipelines for medical image analysis using CNNs, U-Net, and transfer learning approaches.
- Use AI tools in bioinformatics, such as Cytoscape, STRING, and pathway analysis tools, to identify key biomarkers and disease pathways.
- Implement natural language processing (NLP) pipelines for EHR mining, clinical decision support, and chatbot development using domain-specific models like BioBERT.
- Assess AI models for ethical compliance, explainability, and fairness, using interpretability tools like SHAP, LIME, and fairness metrics.
- Critically analyze legal, regulatory, and societal implications of AI in clinical decision-making, ensuring adherence to HIPAA/GDPR and other frameworks.
- Collaborate effectively across medical and computational disciplines, integrating AI techniques with domain-specific knowledge in health sciences.

Modalities of the Course

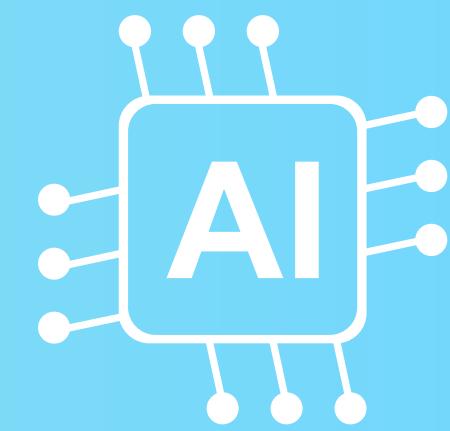
- The course is in online mode.
- The students' intake is 50 per batch.
- The course fee is Rs 10000/- per student. A discount of 25% for a student of the University of Delhi.
- The course duration is 15 weeks.
- The classes will be 2 hours each on Saturday and Sunday.
- The assessment method is continuous evaluation by taking MCQs and assignments and/or quizzes/viva, problem-solving exercises, and/or Seminar Presentations, etc



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Teaching Learning Plan

Unit	Title	No. of Weeks
I	Introduction to AI in Healthcare	1
II	Introduction to Bioinformatics and Multi-Omics	2
III	Machine Learning Foundations in Medical Sciences	2
IV	Medical Imaging and Data Handling	2
V	Deep Learning and CNNs for Medical Image Analysis	2
VI	AI in Drug Discovery and Cheminformatics	2
VII	Natural Language Processing in Healthcare	2
VIII	Ethics, Regulation, and Future of AI in Medicine	2



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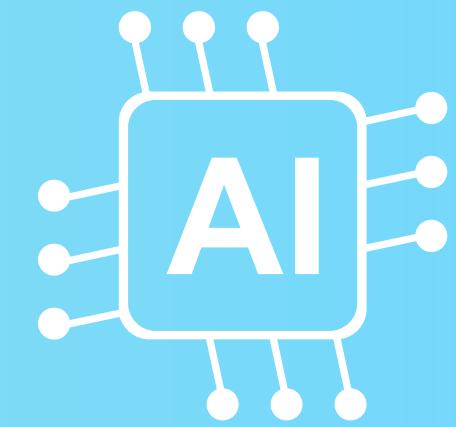
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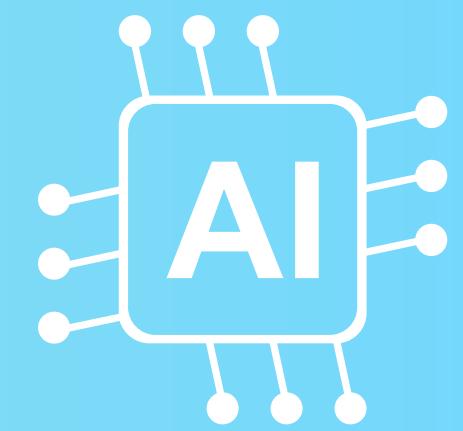
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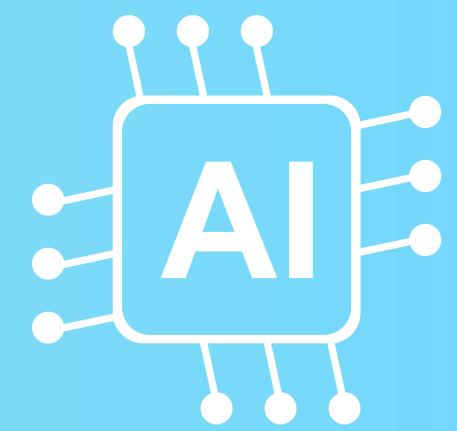
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Director South Campus



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Dean, Academic Affairs

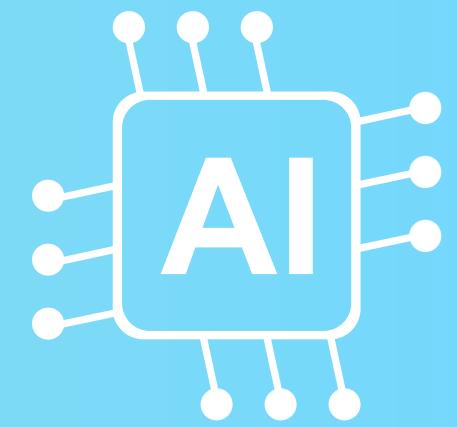


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Course Joint Director

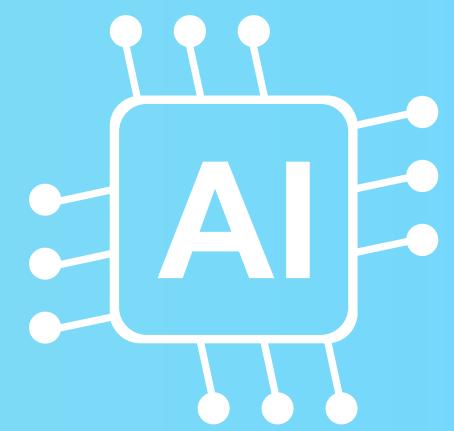


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