Stay ahead of the curve
AI is transforming radiology.
Our beginner-friendly course
welcomes all radiologists
& residents.

ENROLL TODAY!

THE RADIOLOGY HORIZON:

UNDERSTANDING AND EXPLORING THE ROLE OF ARTIFICIAL INTELLIGENCE

Level Up with AI in Radiology:
First-Ever Basic Certificate Course (Online) by IRIA/ICRI

OVERVIEW

The rapid integration of artificial intelligence (AI) into radiology practices has transformed the landscape of medical imaging. To equip radiologists with the necessary skills and knowledge to navigate this evolving field, IRIA proudly presents a cutting-edge education program: "The Radiology Horizon: Understanding and Exploring the Role of Artificaial Intelligence." This program aims to provide radiologists with a basic understanding of AI applications in radiology, including machine learning algorithms, image analysis techniques, and their practical implications in clinical settings.

AIMS & OBJECTIVES

Gaining a comprehensive comprehension of AI is an essential first step before building confidence in AI and discerning the specific situations in which it can be effectively utilized. Radiologists and residents must comprehend the informatics architecture required to enable smooth integration and intricate interplay of artificial intelligence tools.

This course provides the learning to acquire knowledge, comprehend, and implement artificial intelligence strategies to address specific issues in the field of radiology.

During this course, you will be able to gain the knowledge and skills necessary to:

- Comprehend the core framework of AI systems and identify fundamental machine learning algorithms
- Provide an analysis of the potentials and pitfalls of each algorithm.
- Explain standard metrics for assessing algorithm performance.
- Use AI in clinical practice and gain proficiency in legal and ethical dimensions.

ELIGIBILITY

> **This AI course is appropriate for radiologists and residents at all proficiency levels. No previous knowledge or experience in coding / computer science is necessary.**

PROGRAM LAYOUT

Welcome note by President/ Secretary

Module 1 : Building Your Foundation : The Fundamentals of AI in Radiology
August 3 (7:00 PM - 9:00 PM)

1. Module 1a (40 minutes)

-Dr. Swati Goyal

- Overview of AI and its applications in healthcare and radiology
- Historical perspective and evolution of AI in healthcare
- Importance and benefits of AI integration in radiology practices
- The utility of AI in screening, triage, and precision medicine

2. Module 1b (30-40 minutes)

-Dr. Vasanth Venugopal

- Narrow vs General AI, Basics of the hierarchy of AI, Machine learning vs Deep learning algorithms
- ML Techniques - Supervised, Unsupervised, Reinforcement learning
- Neural Networks (ANN, RNN, CNN, Deep-CNN)
- Transfer learning, federated learning
- ML architecture and various models, such as ensemble algorithms such as random forest, decision tree, gradient boosting, and SVM (Support vector machines).

3. Module 1c Computer vision (30 minutes)

-Dr. Gaurang Raval

- Image segmentation algorithms
- Object detection and localization techniques
- Image classification and interpretation using AI

MCQs Session 10-15 Minutes

Module 2 : Big Data
August 10 (7:00 PM - 9:00 PM)

Module 2a (30-40 minutes)

-Dr. Vasanth Venugopal

- Data Curation (identification, cleansing, and transformation)
- Data mining, collection, dataset size, and quality, ground truth, and data annotation.
- Data preprocessing (Handling missing data, normalization, etc)
- Data storage, GPUs
- Open source datasets

Module 2b (30-40 minutes) -Dr. Manisha Bahl

- Feature extraction techniques
- Techniques for data augmentation, noise reduction, and standardization

MCQs Session 10-15 Minutes

Module 3 : Model Training and Validation with Potential Impediments August 17 (7:00 PM - 9:00 PM)

Module 3a (30-40 minutes) -Dr. Amit Kharat

- Model training, validation, and testing
- Ground truth
- Internal vs external validation, generalizability
- Assessment of accuracy, sensitivity, specificity, and other metrics of performance evaluation [such as precision, recall, Receiver Operating Characteristic (ROC) curve, and area under the curve (AUC)]

Module 3b (30-40 minutes) -Dr. Shalini Aggarwal

- Bias in AI models, Black box problems, and Explainable AI-XAI
- Bias due to factors such as the generation of training datasets, the selection of model architecture, and the refining of algorithms after deployment.
- Overfitting, underfitting, class imbalance, brittleness, and hyper-parameters

MCQs Session 10-15 Minutes

Module 4 : Risks, Ethical and Legal Considerations August 24 (7:00 PM - 9:00 PM)

Module 4a (30-40 minutes) -Dr. Vidur Mahajan

- Patient data privacy and security/protection issues
- Regulatory guidelines and compliance (e.g., FDA approval)
- Regulations and initiatives on data access

Module 4b (30-40 minutes) -Dr. Vijay Jayaram

- Ethical implications of AI decision-making in healthcare
- Legal Liability
- Risk mitigation strategies

MCQs Session 10-15 Minutes

Module 5 : Implementing AI Solutions in Radiology Practices & Future Trends of AI in Radiology August 31 (7:00 PM - 9:00 PM)

Module 5a Clinical Applications (40 minutes) - Dr. Sridhar Redla

- AI-based diagnostic assistance systems and AI-enhanced workflow optimization in radiology departments (before, during, and after image acquisition eg. NLP in radiology reporting)
- Integration of AI algorithms into existing radiology workflows
- AI tool monitoring
- Overcoming challenges and barriers to AI implementation

Module 5b LLMs and LMMs (Large Language Models and Large Multimodal Models) -Potentials and Pitfalls (40 minutes) -Dr. Sreenivasa Raju

- Discuss Med-PaLM-2, Generative AI- Chat GPT 3.5, 4, 4V, prompt engineering with clinical applications

MCQs Session 10-15 Minutes

Module 6 : September 7 (7:00 PM - 9:00 PM)

Module 6a Case Studies and Practical Demonstrations (40 minutes) -Dr. Sridhar Redla -Dr. Gerald Lip -Dr. Vasanth Venugopal

- Real-world examples of AI applications in radiology (CXR, Mammography, CT Chest, etc.)
- Discussion of successful case implementations and lessons

Module 6b Future Trends (30-40 minutes) -Dr. Raj Jena

- Emerging technologies (augmented intelligence, synthetic data generation such as GANs, radiomics, holiomics, etc), XR (Extending reality), VR (Virtual reality), and AR (Augmented reality) - shaping the future of AI in radiology
- Integration of AI with other clinical data: Merging imaging data with electronic health records can provide a more comprehensive picture for diagnosis and treatment planning
- Predictive analytics and personalized medicine with AI
- Opportunities for research and collaboration in AI-driven radiology

MCQs Session 10-15 Minutes

Concluding Address by President / Secretary

CERTIFICATION

Assessment of participants' knowledge through quizzes/ assignments.
(A computer-based quiz of 20-30 questions (prepared with questions from the different speakers- MCQs, true/false, matching questions) after each module.

Issuance of certificates upon successful completion of the program.

Upon completion of the course and certification, the participant will possess the necessary knowledge and tools to assess the impact of any AI tool required to leverage AI technologies effectively in their clinical practice, ultimately enhancing patient care outcomes and advancing the field of radiology.

OFFICE BEARERS

Dr. V. N. Varaprasad
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Chairman, ICRI

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Clinical Director for Research,
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The Princess Alexandra Hospital
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FAQS

Who is the target audience for this course?

This course is designed for radiologists and radiology residents.

Do I need a strong computer science background for this course?

No, prior knowledge of computer science is not required. The course will introduce key concepts in a clear and understandable way.

What will I learn in this course?

You'll gain a foundational understanding of AI concepts, their applications in radiology, and their potential impact on your practice.

What format is the course?

This is an asynchronous online learning course with web-based lectures, quizzes, case studies, and resources available for online viewing for 3 days following the lecture day.

How long is the course?

The course is divided into six modules, typically 1.5-2 hours each, for an estimated time commitment of 10-12 hours.

Is this course paid?

Yes. Paid registration is mandatory. IRIA accepts no obligation to refund any fee, or part thereof if any participant does not complete a course.

Will I receive certificate for completing the course?

Yes, this course offers IRIA/ICRI accredited certificate upon completion.

What software or tools will be covered?

The course will focus on general AI principles and their applications in radiology, not specific software programs.

Will there be opportunities to ask questions and interact with instructors?

Yes, you may send your questions via chatbox. The faculty will try to answer your queries as soon as possible.

COURSE FEE - INR 2,000

CLICK HERE TO REGISTER