

Certificate course
Artificial Intelligence in Dentistry

Duration: 1 year

Total lecture duration required as per Syllabus: 4 months

Externship program: 8 months

Resource Persons: Dr. Prasad Rampure/ Dr.Sanjay Pujari / Dr. Sanjay Ankali/ Prof. Mahantesh Laddi/ Prof. Madhurani S./ Dr. Pragya Singh

Lesson Plan:

Name of Modules	Portion to be covered	Dates of classes conduction	Resource Persons
Module 1	Definition of AI, foundation, history, and types	06/01/2024	KLE college of engineering and technology, Chikkodi
	Problem-solving agents, Example problems, Searching for Solutions, Uninformed	07/01/2024	
	Search Strategies: Breadth First Search, Depth First Search	13/01/2024	
	Overview of dentistry, oral health, and common dental issues for AI application.	20/01/2024	
Module 2	Machine Learning Fundamentals: Basics of machine learning: supervised, unsupervised, and reinforcement learning.	21/01/2024	KLE college of engineering and technology, Chikkodi
	Understanding Data Basics of Learning theory Similarity-Based Learning Regression Analysis	27/01/2024	
	Feature engineering, model evaluation, and selection. Application of machine learning in dental diagnostics.	03/02/2024	
Module 3	Medical Image Analysis <ul style="list-style-type: none"> Importance of medical imaging in dentistry. 	04/02/2024	KLE college of engineering and technology, Chikkodi

Module 3	<ul style="list-style-type: none"> Image preprocessing, segmentation, and classification for dental images. Case studies: Analyzing X-rays, 3D imaging interpretation. 		
	Natural Language Processing in Dentistry <ul style="list-style-type: none"> Introduction to NLP, types and its applications. Analyzing dental literature and patient records using NLP. Building a dental chatbot for patient inquiries and education. 	10/02/2024	
	AI in Diagnosis and Treatment Planning <ul style="list-style-type: none"> Developing an understanding of AI-assisted diagnosis in dentistry. Personalized treatment planning using AI recommendations. Incorporating patient preferences and variability. AI use cases in dentistry 	17/02/2024	KLE college of engineering and technology, Chikkodi
	Robotics and Automation in Dentistry <ul style="list-style-type: none"> Introduction to robotics in dentistry and AI-driven assistance in dental procedures. Automation of routine tasks in dental clinics. Hands-on experience: Operating robotic dental tools. 	18/02/2024	KLE college of engineering and technology, Chikkodi
Module 4	Ethical & Regulatory Considerations <ul style="list-style-type: none"> ABDM CDSCO 	24/02/2024 (2 hours)	Dr. Pragya Singh Clinical AI projects, INAI, IIIT, Hyderabad
	Addressing bias and fairness in AI Algorithms <ul style="list-style-type: none"> Ethical considerations in AI-powered diagnosis and treatment planning. 	02/03/2024 (2 hours)	
	Exploring generative models and cutting-edge AI research in dentistry.	03/03/24	

Module 5	Predictions and discussions on the future of AI in oral healthcare.	(1 hour)	Dr. Pragya Singh/KLE college of engineering and technology, Chikkodi
	Capstone Project and Future Directions	16/03/2024	
	Discussions on use cases by students/journal articles – Part 1	(1+1 hour)	
	Capstone Project and Future Directions	17/03/2024	
	Discussions on use cases by students/journal articles – Part 2	(3 hours)	Dr. Pragya Singh Clinical AI projects, INAI, IIIT, Hyderabad
	Introduction to Entrepreneurship	06/04/2024 (1 hour)	
	Ideation and Market research	07/04/2024 (1 hour)	
	Presentation of Ideas for the Project	13/04/2024 (3 hours)	
	Understanding product terminologies (POC, MVP, Prototype)	14/04/2024 (1 hour)	
	Presentation of roadmap of Product development	20/04/2024 (3 hours)	
	Understanding the basics of investment	21/04/2024 (2 hours)	
	Exploring the emerging trends and potential research directions.	04/05/2024 (1 hours)	
Externship program (8 months)	<ul style="list-style-type: none"> Month 1-2: Introduction to entrepreneurship, start-ups, idea conversion to product <ul style="list-style-type: none"> Students work on capstone projects applying AI in dentistry. Presentations of capstone projects and peer feedback. Exploring emerging trends and potential research directions Month 2-4: Onboarding and Project Definition <ul style="list-style-type: none"> Introduction to the externship program's goals and expectations. Match students with externship hosts based on interests and skills. 		

<ul style="list-style-type: none"> • Define externship project goals and objectives. • Month 4-6: Project Work and Hands-on Experience <ul style="list-style-type: none"> • Students collaborate with mentors on AI-related projects. • Gain practical experience implementing AI solutions in real dental scenarios. • Regular check-ins and progress assessments. • Month 6-8: Documentation, Presentation, and Reflection <ul style="list-style-type: none"> • Students document project work, challenges faced, and solutions implemented. • Prepare and deliver presentations on externship projects. • Reflect on integrating academic learning with practical experiences. 	
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for merged
Course co-ordinator

Principal
PRINCIPAL
- L.E.V.K. Institute of Dental Sciences
Nehru Nagar BELAGAVI-590016