

Study & Evaluation Scheme

of

VALUE ADDED COURSE

M.Sc. Nursing (I YEAR)

COURSE TITLE: Artificial Intelligence in Healthcare



Accredited with NAAC **A** Grade

12-B Status from UGC

TEERTHANKER MAHAVEER UNIVERSITY

Delhi Road, NH 9, Moradabad, Uttar Pradesh 244102

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TEERTHANKER MAHAVEER UNIVERSITY
(Established under Govt. of U. P. Act No. 30, 2008)
NH-24, Delhi Road, Moradabad (U.P)

<i>Study & Evaluation Scheme</i>	
<u>SUMMARY</u>	
<i>Institute Name</i>	<i>TEERTHANKER MAHAVEER College of Nursing, TMU, Moradabad.</i>
<i>Name of the course</i>	<i>Artificial Intelligence in Healthcare</i>
<i>Placement</i>	<i>M.Sc Nursing I Year</i>
<i>Duration</i>	<i>30 hours</i>
<i>Medium of instruction</i>	<i>English</i>
<i>Minimum Required Attendance</i>	<i>Theory 75%</i>

Course developed by : Prof. Anushi Singh, Child Health Nursing Dept. TMCON, TMU

Course Outcomes:

At the end of the course, the students will be able to:

- **CO1:** Define artificial intelligence, its types, and describe its relevance in the healthcare and nursing context.
- **CO2:** Identify and discuss the various applications of AI in nursing practice, including clinical decision support systems.
- **CO3:** Explain and illustrate the use of AI in diagnostics, patient monitoring, and healthcare administration through case examples.
- **CO4:** Analyse the ethical, legal, and data privacy challenges related to the integration of AI in healthcare.
- **CO5:** Evaluate the benefits and limitations of AI in enhancing the quality and efficiency of nursing care.

Course code: VAC- 08	Artificial Intelligence in Healthcare	L-20 P-10
Course Content		
Unit I	Foundations of Artificial Intelligence <ul style="list-style-type: none"> • Definition, scope, and historical evolution of AI • Categories of AI: Narrow AI, General AI, and Super AI • Core components: <ul style="list-style-type: none"> ○ Machine Learning (ML) ○ Deep Learning (DL) ○ Natural Language Processing (NLP) 	4 Hours
Unit -II	AI Integration in Healthcare Systems <ul style="list-style-type: none"> • Implementation of AI in hospitals and public health infrastructures • Automation of administrative workflows and clinical processes • AI-enabled public health surveillance and epidemic forecasting Clinical Decision Support Systems (CDSS) <ul style="list-style-type: none"> • Structure and function of AI-powered CDSS • AI for diagnostic assistance, treatment recommendations, and risk prediction • Advantages, limitations, and ethical concerns Telemedicine and Virtual Care: <ul style="list-style-type: none"> ○ Virtual health assistants and AI chatbots ○ Remote consultations and triage using AI algorithms ○ Enhancing access to care and patient engagement AI in Diagnostics and Patient Monitoring <ul style="list-style-type: none"> • Radiology, Pathology, and Genomics: <ul style="list-style-type: none"> ○ Pattern recognition and anomaly detection in diagnostic images and slides ○ AI in genomic data analysis and personalized treatment planning • Remote Patient Monitoring and Wearable Technology: <ul style="list-style-type: none"> ○ Use of AI in wearable health devices (e.g., smartwatches, biosensors) ○ Real-time health tracking and alerts for chronic disease management 	5 Hours
Unit -III	AI in Nursing Assessments and Triage <ul style="list-style-type: none"> • Use of AI tools for patient assessment and symptom analysis • AI-supported triage systems to prioritize patient care 	5 Hours

	<ul style="list-style-type: none"> Enhancing clinical decision-making through data-driven insights <p>AI-Driven Workflow Optimization</p> <ul style="list-style-type: none"> Automation in scheduling, documentation, and resource allocation AI applications in nurse staffing and workload balancing Reducing burnout and improving efficiency through intelligent systems <p>AI-Enhanced Electronic Health Records (EHRs)</p> <ul style="list-style-type: none"> Smart EHRs for improved data retrieval and documentation Natural Language Processing (NLP) in clinical note summarization Predictive modeling for care planning and early warning systems <p>The Role of Digital Health Nursing Leaders</p> <ul style="list-style-type: none"> Bridging the gap between nursing practice and technology Ethical and professional responsibilities in digital healthcare transformation 	
Unit IV	<p>Ethical, Legal, and Privacy Considerations</p> <ul style="list-style-type: none"> Informed consent and ethical data sharing practices Addressing AI bias and promoting algorithmic transparency Ensuring patient safety, accountability, and legal compliance 	3 Hours
Unit V	<p>Future Trends and Innovations in AI</p> <ul style="list-style-type: none"> AI in personalized and precision medicine Interdisciplinary collaboration for healthcare innovation Opportunities, challenges, and implications of AI in nursing and beyond 	3 Hours
Unit VI	<p>Hands on Skill:</p> <ul style="list-style-type: none"> The model to recognize and classify images or sounds that simulate healthcare-related scenarios, such as identifying: Facial expressions indicating pain levels Simulate a teleconsultation using AI-powered chatbot tools. Use of AI-based wearable health data dashboard. Develop a simplified AI-based care plan using symptom data and predictive outcomes. 	10 Hours

Reference Books	<ol style="list-style-type: none"> 1. Topol, E. (2019). Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again. Basic Books. 2. Dilsizian, S. E., & Siegel, E. L. (2014). Artificial Intelligence in Medicine. Academic Press. 3. WHO. (2021). Ethics and governance of artificial intelligence for health. World Health Organization. 4. Shortliffe, E. H., & Cimino, J. J. (Eds.). (2014). Biomedical Informatics: Computer Applications in Health Care and Biomedicine (4th ed.). Springer. 	
Journal Readings	<p>* Latest editions of all the suggested books are recommended.</p> <ul style="list-style-type: none"> • Bharati, S., Mondal, M. R. H., & Podder, P. (2023). A review on explainable artificial intelligence for healthcare: Why, how, and when? arXiv preprint arXiv:2304.04780. https://arxiv.org/abs/2304.04780 • Shaik, T., Tao, X., Higgins, N., Li, L., Gururajan, R., Zhou, X., & Acharya, U. R. (2023). Remote patient monitoring using artificial intelligence: Current state, applications, and challenges. arXiv preprint arXiv:2301.10009. https://arxiv.org/abs/2301.10009 • Biswas, A., & Talukdar, W. (2024). Intelligent clinical documentation: Harnessing generative AI for patient-centric clinical note generation. arXiv preprint arXiv:2405.18346. https://arxiv.org/abs/2405.18346 	
Net Readings	<ol style="list-style-type: none"> 1. https://www.coursera.org/specializations/ai-healthcare?utm_source 2. https://med.kuleuven.be/en/study/programmes/AI-in-healthcare?utm_ 3. https://www.edx.org/learn/computer-science/hamad-bin-khalifa-university-applications-of-ai-in-healthcare?utm_ 	