

COURSE OUTLINE

Course Code / Title	: HA3090 - Special Topics in Global Affairs - Intelligent Systems: AI-Driven Healthcare and Social Media Insights
Pre-requisites	: HA1001 and HA1012
No. of AUs.	: 3
Contact Hours	: 39

Course Description

This course explores the transformative role of artificial intelligence (AI) in addressing challenges at the intersection of healthcare, mental health, and society, with a particular focus on fostering innovation that promotes equity, inclusivity, and sustainability. Students will delve into the use of AI-driven tools, such as machine learning applications, natural language processing (NLP), and digital therapeutics, alongside social media analytics, to uncover scalable solutions for mental health care and public health strategies.

Through engaging discussions, practical activities, and real-world case studies, students will analyze how AI is applied to public health trends, digital trust frameworks, and health tech policy. The course emphasizes the integration of digital trust and sustainability frameworks, highlighting their critical role in building ethical, energy-efficient, and cost-effective health systems that reduce social disparities while generating economic benefits.

By the end of the course, students will be equipped to critically assess the societal, environmental, and ethical implications of AI innovations and contribute to data-driven strategies that enhance global mental health outcomes, foster health equity, and support sustainable technological growth.

Course Aims

- Equip students with the tools to critically analyze cutting-edge AI technologies, particularly in mental health and public health, and their societal, environmental, and economic impact.
- Explore health technologies through the lens of digital trust, equity, and sustainability, emphasizing their role in reducing social disparities and fostering global health innovation.
- Foster interdisciplinary collaboration to design scalable, ethical, and cost-effective solutions for real-world challenges at the intersection of health and technology.

Intended Learning Outcomes (ILO)

By the end of the course, students will:

- Critically assess the societal, environmental, and ethical implications of AI-driven health technologies, with a focus on mental health care.
- Evaluate opportunities to innovate in health tech using frameworks of digital trust and sustainability to promote equitable opportunities in global and local health systems.
- Ideate interdisciplinary and data-driven approaches to pressing health-tech policy issues, emphasizing scalability, inclusivity, and cost-effectiveness.
- Apply systems thinking to analyze the long-term impact of health technologies on sustainability, inclusion, and economic growth.

Course Assessment

Class Participation	: 20%
Weekly Reflections	: 10%
Mid-Term Project	: 30%
Capstone Project	: 40%
Total	: 100%

Planned Weekly Schedule

Module 1: Foundations of AI in Healthcare and Society

Week 1: Introduction to the Emerging Tech Landscape

- **Readings:**
 - World Economic Forum. (2023). *Top 10 Emerging Technologies of the Year*. Retrieved from <https://www.weforum.org/reports/top-10-emerging-technologies-of-the-year-2023>
 - Yadav, S. (2024). Transformative frontiers: A comprehensive review of emerging technologies in modern healthcare. *Cureus*, 16(3), e56538. <https://doi.org/10.7759/cureus.56538>
 - Gartner. (2025). Top technology trends 2025. Retrieved from <https://www.gartner.com/en/articles/top-technology-trends-2025>
 - American Medical Association. (2025). Health care technology trends 2025: AI benefits, wearable use cases, and more. Retrieved from <https://www.ama-assn.org/practice-management/digital/health-care-technology-trends-2025-ai-benefits-wearable-use-cases-and>
- **Activity:** Mapping WEF's focus areas to regional challenges in Southeast Asia.

Week 2: The Role of AI in Global Health

- **Readings:**
 - Lehmann, L. S., Natarajan, V., & Peng, L. (2024). Artificial intelligence in healthcare: A perspective from Google. *Artificial Intelligence in Clinical Practice*, 341-344.
 - Li, J., Dada, A., Puladi, B., Kleesiek, J., & Egger, J. (2024). ChatGPT in healthcare: A taxonomy and systematic review. *Computer Methods and Programs in Biomedicine*, 245, 108013. <https://doi.org/10.1016/j.cmpb.2024.108013>
 - Montazeri, M., Galavi, Z., & Ahmadian, L. (2024). What are the applications of ChatGPT in healthcare: Gain or loss?. *Health Science Reports*, 7(2), e1878. <https://doi.org/10.1002/hsr2.1878>
 - Reddy, S. (2024). Generative AI in healthcare: An implementation science-informed translational path on application, integration, and governance. *Implementation Science*, 19(1), 27. <https://doi.org/10.1186/s13012-024-01357-9>
 - Haltaufderheide, J., & Ranisch, R. (2024). The ethics of ChatGPT in medicine and healthcare: A systematic review on large language models (LLMs). *npj Digital Medicine*, 7, 183. <https://doi.org/10.1038/s41746-024-01157-x>
- **Case Study:** AI and diagnostics in underserved communities.

Module 2: AI-Driven Mental Health and Digital Therapeutics

Week 3: AI in Mental Health

- **Readings:**
 - Beg, M. J., & Verma, M. K. (2024). Exploring the Potential and Challenges of Digital and AI-Driven Psychotherapy for ADHD, OCD, Schizophrenia, and Substance Use Disorders: A Comprehensive Narrative Review. *Indian journal of psychological medicine*, 02537176241300569. Advance online publication.
 - Olawade, D. B., Wada, O. Z., Odetayo, A., David-Olawade, A. C., Asaolu, F., & Eberhardt, J. (2024). Enhancing mental health with Artificial Intelligence: Current trends and future prospects. *Journal of medicine, surgery, and public health*, 100099.
 - Thakkar, A., Gupta, A., & De Sousa, A. (2024). Artificial intelligence in positive mental health: a narrative review. *Frontiers in digital health*, 6, 1280235. <https://doi.org/10.3389/fdgth.2024.1280235>
 - Graham, S., Depp, C., Lee, E. E., Nebeker, C., Tu, X., Kim, H. C., & Jeste, D. V. (2019). Artificial Intelligence for Mental Health and Mental Illnesses: an Overview. *Current psychiatry reports*, 21(11), 116. <https://doi.org/10.1007/s11920-019-1094-0>
- **Activity:** Evaluation of AI tools for mental health interventions.

Week 4: Digital Therapeutics in Healthcare

- **Readings:**
 - Vasdev, N., Gupta, T., Pawar, B., Bain, A., & Tekade, R. K. (2024). Navigating the future of health care with AI-driven digital therapeutics. *Drug Discovery Today*, 104110.
 - Hu P, Hu L, Wang F and Mei J (2024) Editorial: Computing and artificial intelligence in digital therapeutics. *Front. Med.* 10:1330686. doi: 10.3389/fmed.2023.1330686

- Barriers to adoption: Policy, accessibility, and patient trust.
 - Van Kessel, R., Roman-Urrestarazu, A., Anderson, M., Kyriopoulos, I., Field, S., Monti, G., Reed, S. D., Pavlova, M., Wharton, G., & Mossialos, E. (2023). Mapping Factors That Affect the Uptake of Digital Therapeutics Within Health Systems: Scoping Review. *Journal of medical Internet research*, 25, e48000. <https://doi.org/10.2196/48000>
- **Activity:** Analysis of digital therapeutics implementation challenges.

Module 3: Building Trust and Sustainability in Health Tech

Week 5: Building Digital Trust in Health Technologies

- **Readings:**
 - Belfrage, S., Helgesson, G., & Lynøe, N. (2022). Trust and digital privacy in healthcare: A cross-sectional descriptive study. *BMC Medical Ethics*, 23, 19. <https://doi.org/10.1186/s12910-022-00758-z>
 - IQVIA. (2024). Digital health trends 2024. Retrieved from <https://www.iqvia.com/insights/the-iqvia-institute/reports-and-publications/reports/digital-health-trends-2024>
 - Reuters. (2024). Legal implications, technological policy, and business in digital health: Forecast 2024. Retrieved from <https://www.reuters.com/legal/legalindustry/digital-health-forecast-2024-legal-implications-technological-policy-business-2024-02-26/>
 - World Economic Forum. (2024). Health data collaboration: Inclusive healthcare. Retrieved from <https://www.weforum.org/stories/2024/05/health-data-collaboration-inclusive-healthcare/>
- **Workshop:** Designing a digital trust framework for patient data exchange.

Week 6: Sustainability in Computing

- **Readings:**
 - Chien, A. A., Lin, L., Nguyen, H., Rao, V., Sharma, T., & Wijayawardana, R. (2023, July). Reducing the Carbon Impact of Generative AI Inference (today and in 2035). In *Proceedings of the 2nd workshop on sustainable computer systems* (pp. 1-7).
 - Ueda, D., Walston, S. L., Fujita, S., et al. (2024). Climate change and artificial intelligence in healthcare: Recommendations towards a sustainable future. *Diagnostic and Interventional Imaging*, 105(11), 453–459. <https://doi.org/10.1016/j.diii.2024.06.002>
 - Amazon Web Services. (2024). Healthy people and planet: Supporting sustainability in healthcare cloud. Retrieved from <https://aws.amazon.com/blogs/publicsector/healthy-people-planet-supporting-sustainability-healthcare-cloud/>
- **Guest Lecture:** Balancing innovation with environmental stewardship.

Module 4: Advanced Topics in AI for Healthcare and Society

Week 7: Ethical Innovation in Emerging Markets

- **Readings:**
 - McCausland, T. (2023). Ethics in Innovation. *Research-Technology Management*, 66(6), 52–54. <https://doi.org/10.1080/08956308.2023.2257107>
 - Zahoor, N., et al. (2024). *Responsible Innovation in Emerging Markets*.
 - UNICEF (2024). *Youth-led Innovations in Emerging Markets*.
 - <https://hbr.org/2023/05/how-to-avoid-the-ethical-nightmares-of-emerging-technology>
 - Xiao, S., Roh, T., Ghauri, P.N. et al. MNCs' Social Innovation in Emerging Markets: A Stakeholder Perspective. *Manag Int Rev* 64, 633–670 (2024). <https://doi.org/10.1007/s11575-024-00537-5>
- **Activity:** Group discussion on ethics driving adoption in emerging economies.

Week 8: Capstone Project Kickoff

- **Activity:** Teams form to tackle health-tech challenges inspired by WEF focus areas.

Week 9: Data Ethics in Mental Health Applications

- **Readings:**
 - Privacy concerns with mental health data (e.g., Talkspace and BetterHelp).
 - Risks of bias in AI-driven mental health tools.
 - Tavory T.Regulating AI in Mental Health: Ethics of Care Perspective;JMIR Ment Health 2024;11:e58493;URL: <https://mental.jmir.org/2024/1/e58493>;DOI: 10.2196/58493
 - Lysaght, T., Chan, H.Y., Scheibner, J. et al. An ethical code for collecting, using and transferring sensitive health data: outcomes of a modified Policy Delphi process in Singapore. *BMC Med Ethics* 24, 78 (2023). <https://doi.org/10.1186/s12910-023-00952-7>
- **Activity:** Group debate on whether AI should replace human therapists in specific interventions.

Week 10: Social Media and Public Health Insights

- **Readings:**
 - Kanchan, S., & Gaidhane, A. (2023). Social Media Role and Its Impact on Public Health: A Narrative Review. *Cureus*, 15(1), e33737. <https://doi.org/10.7759/cureus.33737>
 - White, B.K., Wilhelm, E., Ishizumi, A. et al. Informing social media analysis for public health: a cross-sectional survey of professionals. *Arch Public Health* 82, 1 (2024). <https://doi.org/10.1186/s13690-023-01230-z>
 - <https://www.mckinsey.com/mhi/our-insights/gen-z-mental-health-the-impact-of-tech-and-social-media>
 - <https://www.iqvia.com/blogs/2024/01/the-right-perspective-harnessing-social-media-for-medical-insights>
 - Using social media analytics to track public sentiment and health trends.
 - Case Study: Mental health awareness campaigns and social media monitoring.

Week 11: Policy Challenges in Cross-Border Health Tech

- **Readings:**

- Gasser, U., & Palfrey, J. (2020). *Building a Digital Commons*.
- Xia, L., et al. (2024). *Paradigm Transformation of Global Health Data Regulation*.
- van der Zanden, B.A., Hoebe, C.J. & Horstman, K. European policies for public health in border regions: no European mindset as yet. *BMC Public Health* 24, 746 (2024).
<https://doi.org/10.1186/s12889-024-18175-9>
- <https://www.who.int/europe/news-room/08-01-2024-building-cross-border-collaboration-in-health>
- Glass, L. T., Schlachta, C. M., Hawel, J. D., Elnahas, A. I., & Alkhamesi, N. A. (2022). Cross-border healthcare: A review and applicability to North America during COVID-19. *Health policy OPEN*, 3, 100064. <https://doi.org/10.1016/j.hlopen.2021.100064>
- **Role-Playing Exercise:** Developing harmonized policies for digital health platforms.

Week 12: Capstone Project Work

- **Activity:** Group work and consultation with instructor on final project development.

Week 13: Capstone Project Presentations

- **Activity:** Presentation of final projects and peer critique.