AI and Tourism

Masters of Information Technology - Artificial Intelligence

Gandaki University

Instructor: Bidur Devkota, PhD

GCES, Pokhara

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Course Overview

- **Course Code:** [To be assigned]
- **Course Type:** Elective
- **Year:** II
- **Semester:** II
- **Credit Hour:** 3
- **Contact Hours:** 45 hours

General Course Objectives:

- Introduce AI applications and transformative impacts on tourism
- Equip students with skills to analyze tourism datasets using AI
- Examine AI's role in sustainable tourism development and SDGs
- Apply AI techniques for improving tourist experiences and destination management

Course Description

This course blends theory and practice in applying Artificial Intelligence (AI) to tourism. Students will explore key areas like:

- Tourist behavior analysis
- Recommendation systems
- Geospatial analytics
- Smart destination planning
- AI-enabled sustainability monitoring

The course integrates:

- Recent research literature
- Case studies
- Lab projects
- Real-world learning experience

Final Project: AI applications in tourism or sustainable destination management

Course Outcomes

By the end of this course, students will be able to:

1. Identify and explain core AI methods used in tourism
2. Apply ML and NLP techniques to analyze tourism data sources
3. Build AI-powered personalized recommendation systems
4. Utilize geospatial data and VGI for tourism applications
5. Evaluate AI's impact on sustainable tourism practices and SDGs
6. Critically assess research trends in AI and tourism
7. Address ethical and responsible AI usage in tourism services

Course Structure - 8 Units

- Unit 1: Introduction to AI in Tourism (6 hours)
- Unit 2: Tourism Data Collection and EDA (8 hours)
- Unit 3: Machine Learning and NLP in Tourism (8 hours)
- Unit 4: AI-Powered Recommendation Systems (5 hours)
- Unit 5: AI and Geospatial Analytics (6 hours)
- Unit 6: AI for Sustainable and Smart Tourism (6 hours)
- Unit 7: Ethical and Future Trends in AI Tourism (6 hours)

Total: 45 contact hours

Unit 1: Introduction to AI in Tourism (6 hours)

Topics Covered:

- Overview of AI and its relevance to tourism
- AI in tourism: Trends, challenges, and opportunities
- Interdisciplinary approaches (economics, geography, computer science)
- Case studies in hospitality, travel agencies, and destination management

Example Research:

- **Nunez et al. (2024):** "Machine learning applied to tourism: A systematic review"
- Analysis of 150+ studies showing 68% growth in ML tourism applications since 2020
- Key finding: Personalization and demand forecasting are most common AI uses

Unit 2: Tourism Data Collection & EDA (8 hours)

Topics Covered:

- Data Sources and APIs: VGI, TripAdvisor, Booking.com, Google Maps
- Data preprocessing and handling unstructured data
- Feature engineering and descriptive statistics
- Visualization techniques for tourism data
- Case study: Tourist arrivals and spending patterns analysis

Example Application:

- **Booking.com API integration** for real-time accommodation data analysis
- Seasonal trend identification using 5 years of tourist arrival data
- Outlier detection in spending patterns across different tourist segments

Unit 3: Machine Learning and NLP in Tourism (8 hours)

Topics Covered:

- Predictive modeling of tourist arrivals and preferences
- Supervised and unsupervised ML for tourism data
- Classification and clustering of tourism data
- Opinion mining and sentiment analysis on tourism reviews

Example Research:

- **Lahagun et al. (2024):** "Machine Learning-Based Social Media Review Analysis"
- NLP analysis of 50,000+ TripAdvisor reviews achieving 89% sentiment accuracy
- Real-time classification of tourist feedback into service improvement categories

Unit 4: AI-Powered Recommendation Systems (5 hours)

Topics Covered:

- Personalized recommender systems
- Hybrid filtering techniques
- Destination management applications
- Context-aware travel recommendations

Example Application:

- **Shrestha et al. (2024):** "Personalized Tourist Recommender System"
- Hybrid approach combining collaborative + content-based filtering
- 40% improvement in recommendation relevance over traditional methods
- Integration of weather, season, and user preferences for itinerary planning

Unit 5: AI and Geospatial Analytics (6 hours)

Topics Covered:

- Smart tourist area identification
- Geographical tracking of tourists
- GPS and mobile data analysis
- Destination route optimization

Example Research:

- **Devkota et al. (2019):** "Using VGI and Nighttime Light Data for Tourism AOI"
- Combined social media check-ins + satellite imagery to identify tourist hotspots
- Identified 15% previously unknown popular areas in Pokhara valley
- Applied in smart city planning and infrastructure development

Unit 6: AI for Sustainable and Smart Tourism (6 hours)

Topics Covered:

- AI's contribution to Sustainable Development Goals (SDGs)
- Smart destinations and green AI
- Sustainable tourism applications
- Environmental impact monitoring

Example Research:

- **Peeters et al. (2024):** "Mitigating climate change in tourism"
- AI models predicting carbon footprint of tourist activities
- Optimization algorithms reducing energy consumption in hotels by 25%
- SDG-aligned tourism planning using multi-objective optimization

Unit 7: Ethical and Future Trends (6 hours)

Topics Covered:

- Ethical and responsible AI in tourism
- Data collection ethics and privacy
- Risks and opportunities in AI tourism
- Future research pathways

Example Research:

- **Gössling et al. (2025):** "AI and sustainable tourism: Risks and opportunities"
- Framework for ethical AI deployment in developing countries
- Analysis of privacy concerns in tourist tracking systems
- Guidelines for responsible data collection from mobile devices

Textbooks & References

Core Textbooks:

1. Chiwaridzo (2024) - AI Technologies for Personalized and Sustainable Tourism
2. IGI Global (2024) - AI Innovations for Travel and Tourism
3. Springer (2025) - Smart Tourism: AI and Blockchain Impact
4. Egger (2023) - Applied Data Science in Tourism
5. Zafarani et al. (2014) - Social Media Mining

Key Research Articles: 8 recent publications (2023-2025) covering:

- Systematic reviews
- Sustainability applications
- Recommender systems
- Geospatial analysis
- Ethical considerations

Teaching Methodology

- **Theory + Practice** balanced approach
- **Case Studies** from real tourism industry applications
- **Lab Projects** with actual tourism datasets
- **Research Integration** with latest academic publications
- **Final Project** applying AI to real tourism challenges

Assessment Methods:

- Practical assignments (40%)
- Research paper analysis (20%)
- Final project implementation (40%)

Expected Learning Outcomes

Upon completion, students will be equipped to:

- Design and implement AI solutions for tourism industry challenges
- Analyze and interpret complex tourism datasets
- Develop sustainable tourism strategies using AI
- Address ethical considerations in tourism AI applications
- Contribute to research and innovation in smart tourism

Career Opportunities:

- Tourism data scientist
- Smart destination manager tourism consultant
- Sustainable tourism analyst

Getting Started

Next Steps:

1. Review course materials on learning platform
2. Set up Python/R environment for lab work
3. Explore provided tourism datasets
4. Begin literature review of key research articles
5. Start thinking about final project ideas

Support Resources:

- Course website: [URL]
- Discussion forum: [Platform]
- Office hours: [Schedule]
- Lab sessions: [Schedule]

Questions?