

ICT-117 Applications of ICT

Course Name: **Applications of ICT**

Credit Hours: 2-1

Contact Hours: 2-1

Pre-requisites: Nil

Course Introduction:

This course merges the principles and technologies of Information & Communication Technologies (ICT) with an introduction to Artificial Intelligence and Data Science. It provides a comprehensive overview of foundational ICT topics such as web development, programming, and mobile application development, as well as core AI and data science concepts including data loading, preprocessing, summarization, and visualization. Students will explore the applications of AI through regression and classification techniques. The curriculum also emphasizes practical skills in implementing data science and machine learning tasks using programming tools. By the end of the course, students will understand how the synergy of ICT and AI drives innovation across various domains such as education, finance, healthcare, security, and communications.

CLO No	Course Learning Outcomes	Bloom Taxonomy
CLO-1	Understand the importance of ICT in various fields and industries, such as business, healthcare, education, and entertainment.	C2 (Understand)
CLO-2	Understand emerging technologies like AI and Data Science and their impact on various fields and industries	C2 (Understand)
CLO-3	Apply data analytics tools for data loading, preprocessing, summarization and visualization	C3 (Apply)

Course Plan:

Week	Main Topics to be covered
1	Introduction to Information and Communication Technologies

2	Programming Concepts
3	Programming Concepts
4	Web and Mobile Application Development Process
5	ICT Application (Teaching, Learning, Research, Team Communication Tools)
6	Describing role of Internet and its working
7	Introduction to Artificial Intelligence and Machine Learning
8	Introduction to Statistics using Python
9	MIDS
10	Data loading, visualization and preprocessing
11	Data summarization for data science applications
12	Introduction to regression and classification tasks
13	Applications of regression in engineering
14	Applications of classification in engineering
15	Importance and issues of ethics in Data and AI
16	Case studies of ICT in healthcare, business
17	Student Presentations
18	End Semester Exams

Reference Materials:

- "Discovering Computers 2022" by Misty E. Vermaat, Susan L. Sebok, Steven M. Freund, Jennifer T. Campbell, and Mark Frydenberg (2021)
- "Fundamentals of Information Technology" by Alexis Leon and Mathews Leon (2015)
- Andreas C. Müller, Sarah Guido, Introduction to Machine Learning with Python: A Guide for Data Scientists, 1st edition, O'Reilly Media, 2016.
- Wes Mckinney, Python for Data Analysis: Data Wrangling with pandas, NumPy, and Jupyter, 3rd Edition, O'Reilly, 2022.
- Mark Lutz, Learning Python: Powerful Object-Oriented Programming, 5th Edition, O'Reilly, 2013.