Applications of ICT

Code	Credit Hours
CS- 108	2-1

Course Description

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.

Books:

- 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.

Prerequisites

Nil

ASSESSMENT SYSTEM FOR THEORY

Quizzes	10%
Assignments	5%
Projects	10 %
Mid Terms	30%
ESE	45%

ASSESSMENT SYSTEM FOR LAB

Quizzes	10%-15%

Assignments	5% - 10%
Lab Work and Report	70-80%
Lab ESE/Viva	20-30%

Teaching Plan

Week No	Topics	Learning Outcomes
1	Introduction	Course Outline, objectives, teaching plan, assessment method, concepts review, Intro to ICT
2-6	ICT concepts	ICT Application (Teaching, Learning, Research, Team Communication Tools), Web/Mobile Application Development Process, Describing role of Internet and its working, Intro to Cloud Computing (SAS, PAS, IAAS, Azure, AWS, GCP), Describing role of Database Systems
7-8	Programming	Programming Concepts (Python)
9	**MID TERM EXAM**	
10-14	Intro to ML & AI	Introduction to Statistics, Artificial Intelligence and Machine Learning, Data loading, visualization and preprocessing, Data summarization for data science applications, Introduction to regression and classification tasks, Applications of regression and classification (computer science, engineering, data analytics, financial sector etc.)
15-17	Ethics, Networks, LLM	Importance and issues of ethics in Data and AI, Case studies of ICT in healthcare, business, Computer Networks, LLM & Generative AI Student Presentations

18	**End Semester Exams**	

Practical:

Experiment No	Description
1	Microsoft Office (PowerPoint, Excel and Word)
2	Web/Mobile Application Development
3	Programming Fundamentals
4	Programming Fundamentals
5	Network Security
6	Network Security
7	Database Management Systems
8	Computer Networking
9	Computer Networking
10	Introduction to Machine Learning
11	Introduction to Machine Learning - Regression
12	Introduction to Machine Learning - Regression
13	Introduction to Machine Learning - Regression
14	Introduction to Machine Learning -Classification
15	Open Ended Lab