Course code	Course Name	Credit
26PL607	AI TOOLS FOR RESEARCH AND DATA ANALYSIS	4

Course Objectives

- To understand the fundamental concepts, principles, and applications of Artificial Intelligence (AI) in academic research and data analysis.
- To examine the role of AI-driven tools and technologies in enhancing research processes across disciplines.
- To develop practical skills in the use of AI applications for literature review, data collection, analysis, interpretation, and report writing.
- To integrate AI tools with traditional research methodologies to improve the quality and efficiency of research outcomes.
- To apply AI-based techniques for qualitative and quantitative data analysis.

Learning Outcome

After the completion of the course, the students will be able to

- Explain the role of artificial intelligence in transforming research methodologies and data analysis.
- Conduct efficient and systematic literature reviews using AI tools.
- Apply AI assisted tools for quantitative and qualitative data analysis.
- Evaluate the ethical implications of AI in research.
- Design and execute minor research project integrating AI tools at different stages.

Unit I: Introduction to AI in Research (10 hrs)

Meaning and scope of AI; Types of AI tools (generative AI, analytical, automation); Challenges of AI in academic work

Unit II: AI Tools for Literature Review (13 hrs)

Concept of AI assisted research; AI based academic search tools: Purpose and Features (Inciteful, research rabbit, notebookLM, Elicit); Limitation of AI in literature review

Unit III: AI Tools for Academic Writings (13 hrs)

Concept of AI assisted writing; AI tools for writing: Purpose and Features (Jenni AI, Paperpal, Grammarly, Sudowrite, Wordtune); Academic Integrity and Plagiarism

Unit IV: AI Tools for Data Analysis and Reference Management (14 hrs)

No code tools (ChatGPT, Microsoft Excel, Power BI); Application and Usage of AI powered analytics Platforms Zotero & Mendeley: Features and Functions

Unit V: Ethics and Practical Application of AI (10 hrs)

Ethical issues in AI-based research; Reliability and limitations of AI tools; Guidelines for responsible AI use in academics

Suggested Readings

1. Boland, Angela, M. Gemma Cherry, Rumeana Dickson (2013), *How to Perform a Systematic Literature Review*, Springer Publication.
2. Crawford, Kate (2021), *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence*, Yale University Press.
3. Gareth, James, Daniela Witten, Trevor Hastie, Robert Tibshirani, Jonathan Taylor (2013), *An Introduction to Statistical Learning with Applications in R,* Springer Publications.
4. Graff, Gerald & Cathy Birkenstein (2006), *They Say/I Say: The Moves that Matter in Academic Writing*, W.W. Norton & Company Publication.
5. Mitchell, Tom M (1997), *Machine Learning*, McGraw Hill Publication.
6. Russell, Stuart and Peter Norvig (2024, 4th edition), *Artificial Intelligence: A Modern Approach*, Pearson Education, India.
7. O'Niel, Cathy (2016), *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*, Crown Publishing Group.
8. Taulli, Tom (2019), *Artificial Intelligence Basics: A Non-Technical Introduction*, Apress publication.

COs and Bloom's Taxonomy Level (BTL) Mapping- 26PL607		
Course Outcomes	**On completing P.G. program in Political Science the students will be able to**	**BTL**
CO1	Define and explain the meaning, scope, and types of AI tools used in research, and identify key challenges associated with their use in academic work.	K1, K2
CO2	Use AI-based tools such as Inciteful, Research Rabbit, NotebookLM, and Elicit to conduct efficient and systematic literature reviews.	K3
CO3	Demonstrate the use of AI writing tools like Jenni AI, Paperpal, Grammarly, Sudowrite, and Wordtune for academic writing while maintaining integrity and avoiding plagiarism.	K4
CO4	Analyze and interpret research data using AI-enabled and no-code tools such as ChatGPT, Microsoft Excel, and Power BI, and manage references effectively using Zotero and Mendeley.	K5
CO5	Develop a research workflow integrating AI tools for literature review, writing, data analysis, and referencing while adhering to ethical guidelines and best practices.	K6

BTL K1 and K2 – remembering and understanding, K3- Applying, K4 – Analyse, K5- Evaluate and K6- Create

Relationship Matrix- 26PL607													
Course Outcomes	**Programme Outcomes (POs)**						**Programme Specific Outcomes (PSOs)**						**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**	
CO1	2	2	2	1	2	1	2	2	2	1	2	1	1.6
CO2	3	3	3	2	2	2	3	3	2	2	3	2	2.5
CO3	3	3	3	2	2	2	3	3	2	2	3	2	2.5
CO4	3	3	3	2	2	2	3	3	2	2	3	2	2.5
CO5	3	3	3	2	2	2	3	3	2	2	3	2	2.5
												Total	**2.32**

Mean Score: 3- High, 2- Medium/Moderate, 1-Low