

# AI for Data Analytics

Automate and enhance the data analysis process with artificial intelligence (AI). In this course, you'll learn how to utilize AI tools to collect, preprocess, analyze, visualize, and interpret data without the need for extensive coding knowledge.

Group classes in Live Online and onsite training is available for this course. For more information, email [onsite@graduateschool.edu](mailto:onsite@graduateschool.edu) or visit: <https://sdfm.graduateschool.edu/courses/ai-data-analytics>



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## Course Outline

### Trust but Verify

- Why verification is taught first: AI failure modes including hallucinations, wrong methods, and context blindness
- The 7-step AI Validation Checklist for systematically evaluating any AI-generated analysis
- Live hallucination example: seeing how AI fabricates plausible statistics and fictional citations
- Introduction to the AI Traceability Document for professional accountability

### The AI & Analytics Landscape

- The analytics maturity curve: descriptive, diagnostic, predictive, and prescriptive analytics
- AI taxonomy for analysts: how machine learning, deep learning, and generative AI relate to data work
- The ACHIEVE framework for deciding when AI adds value vs. when manual methods are better
- Bias and fairness in AI: real-world examples and how to incorporate fairness into your verification practice

### GenAI as Your Analytics Co-Pilot

- The AI-augmented analytics workflow: Import, Clean, Explore, Analyze, Visualize, Report, Verify
- Hands-on lab: clean a messy dataset, generate statistics, ask analytical questions, visualize findings, and verify results
- Understanding the “dirty data” problem: how AI automates cleaning but requires your judgment on every decision
- Why “clean” doesn’t mean “perfect”: recognizing data quality issues that survive automated cleaning

### Prompt Engineering for Data Work

- Three things every analytical prompt needs: role, task with data specifics, and output format
- Six prompting patterns for analysts: Describe, Explore, Compare, Predict, Explain, Validate
- Iterative prompting techniques: Refine, Redirect, Constrain, and Challenge
- Comparing AI tools: running the same prompt in different tools and evaluating where they agree and disagree
- Building a personal prompt library of tested, reusable prompts for real job tasks

### Predictive Analytics Demystified

- Core concepts: regression, classification, and clustering — when to use each, no math required

- Key metrics: R-squared, p-values, accuracy, precision, recall, and the train/test split
- Hands-on lab: build a classification model, evaluate metrics, write data-backed recommendations, and self-critique
- Defending AI-assisted findings under stakeholder questioning using your traceability document

### **Critical Evaluation & Responsible AI**

- Progressive verification: detecting Simpson's Paradox, confounding variables, selection bias, and overfitting
- Finding subtle errors in professional-looking AI analyses through structured evaluation exercises
- Applying the full validation checklist collaboratively at speed
- Data privacy and governance: when NOT to upload data, and regulatory considerations (HIPAA, FERPA, GDPR, FISMA)

### **AI Tools, Chain Reaction & Live Problem-Solving**

- The 2026 AI analytics tool landscape: ChatGPT, Claude, Copilot, Gemini, Tableau AI, and ThoughtSpot
- End-to-end automation demo: from raw data to stakeholder-ready executive brief in minutes
- Live problem-solving: a real work problem solved with AI in real time, unrehearsed
- Advanced techniques overview: NLP for text analysis and time series forecasting

### **Capstone**

- Redesign a real workplace workflow with AI tools, verification steps, and traceability built in
- Map the before and after: current steps, tools, and time vs. the AI-augmented version
- Estimate time savings, identify risks, and define a concrete first implementation step
- Present and defend your redesign in a mini stakeholder simulation