

AI Orchestration and Intelligent Business Systems

A Cutting-Edge Information Systems & Analytics Course

Course purpose

This course prepares business students to design, evaluate, and govern AI-enabled business solutions. Rather than training students to depend on one AI product, it develops durable skills in problem framing, decomposition, data and analytics, AI model selection, agent orchestration, workflow design, automation, evaluation, governance, and executive communication.

The Problem Architect framework

Students learn a repeatable five-stage method: Define the business problem; Decompose it into tasks and decisions; Delegate tasks to people, data systems, AI models, or agents; Design the workflow, controls, and feedback loops; Deliver, evaluate, govern, and improve the solution.

Learning outcomes

By the end of the course, students should be able to:

1. Frame ambiguous organizational problems as measurable business objectives.
2. Decompose complex work into tasks, decisions, data requirements, and controls.
3. Compare AI models, agents, tools, and automation platforms based on fit rather than hype.
4. Design multi-model and multi-agent workflows.
5. Use analytics, SQL/spreadsheets/BI, and basic Python where appropriate.
6. Evaluate AI outputs for accuracy, reliability, bias, security, cost, and provenance.
7. Design human-in-the-loop governance and escalation mechanisms.
8. Communicate an AI-enabled solution to technical and executive audiences.
9. Build and defend an AI transformation prototype for a real organization.

15-week course map

Week 1 — AI and the changing information-systems landscape: from software tools to AI-enabled workflows.

Week 2 — Problem architecture: business problems, objectives, stakeholders, constraints, and success metrics.

Week 3 — Task decomposition: turning messy work into structured workflows.

Week 4 — Data foundations: data quality, provenance, SQL/BI concepts, and retrieval.

Week 5 — AI model literacy: capabilities, limitations, cost, latency, privacy, and model selection.

Week 6 — Prompting as specification: context, constraints, examples, structured outputs, and evaluation criteria.

Week 7 — Agents: tools, memory, planning, action, permissions, and human oversight.

Week 8 — Orchestration: routing work among multiple models, agents, tools, and people.

Week 9 — Automation and integration: APIs, webhooks, workflow platforms, and enterprise systems.

Week 10 — Analytics + AI: decision support, forecasting, classification, summarization, and scenario analysis.

Week 11 — Evaluation: accuracy, robustness, hallucination testing, red-teaming, and business KPIs.

Week 12 — Governance: privacy, security, bias, compliance, auditability, and responsible AI.

Week 13 — Intelligent enterprise design: redesigning processes and roles around AI.

Week 14 — Capstone studio: prototype, test, document, and present.

Week 15 — Executive showcase: AI transformation proposals and lessons learned.

Signature assignments

1. Problem Framing Memo (10%): convert an ambiguous business issue into a measurable problem statement.
2. AI Capability Benchmark (10%): compare several current AI systems against a common business task.
3. Workflow Decomposition Lab (15%): map a process into human, data, AI, agent, and automation components.
4. Orchestration Prototype (20%): build a working multi-tool or multi-agent workflow.
5. Governance & Risk Review (15%): produce a risk register, controls, escalation rules, and audit plan.
6. AI Transformation Capstone (30%): solve a real organizational problem and defend the design to a mock executive panel.

Recommended competency stack

Business: process analysis, requirements, project management, communication, change management.

Analytics: spreadsheets, SQL, data visualization/BI, statistics, experimentation, basic Python.

AI: model selection, prompting/specification, retrieval concepts, agents, tool use, evaluation.

Systems: APIs, integration, workflow automation, identity/access, data architecture.

Governance: privacy, security, provenance, auditability, bias, risk management, human oversight.

Human: critical thinking, judgment, collaboration, storytelling, ethical reasoning.

Capstone template

Students select a real business process. They document the current state, define measurable outcomes, decompose the work, identify data sources, select AI/model/tool components, design the orchestration architecture, define human checkpoints, test the solution, estimate value and risk, and present an executive recommendation. The deliverable is not merely a chatbot; it is a governed AI-enabled business system.

Assessment philosophy

Grade the student's reasoning as heavily as the technology. A sophisticated tool used on a poorly framed problem should score lower than a simple, well-governed solution that creates measurable business value. Rubrics should reward problem definition, system design, evidence, evaluation rigor, governance, and communication.

Curriculum positioning

The course can stand alone as an upper-division elective or become the middle course in a sequence: AI Foundations → AI Orchestration and Intelligent Business Systems → Intelligent Enterprise Capstone. It naturally bridges information systems, business analytics, operations, and emerging AI strategy.