

IS4542: AI AGENTS: BUILDING INTELLIGENT BUSINESS SOLUTIONS WITH LARGE LANGUAGE MODELS

Effective Term

Semester B 2025/26

Part I Course Overview

Course Title

AI Agents: Building Intelligent Business Solutions with Large Language Models

Subject Code

IS - Information Systems

Course Number

4542

Academic Unit

Information Systems (IS)

College/School

College of Business (CB)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

IS3542 Generative Artificial Intelligence for Business

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Additional Information

Nil

Part II Course Details

Abstract

This course addresses the growing demand for professionals skilled in developing AI agents using Large Language Models (LLMs) for business applications. Students will learn to design, develop, and deploy AI agents that leverage various LLMs (including DeepSeek, Llama2, OpenAI, Gemini) through both programmatic and no-code/low-code approaches. The course emphasizes practical implementation using industry-standard tools like n8n and make.com, focusing on enterprise-grade solutions for document processing, customer service, financial analysis, and workflow automation. Students will gain hands-on experience in integrating LLMs with business systems while considering security, scalability, and business value creation.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Explain LLM capabilities and their applications in business contexts	25	x	x	
2	Design and implement AI agents using various LLMs and integration platforms	35		x	x
3	Develop enterprise-grade solutions incorporating security and scalability considerations	40	x	x	x

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	1. Concepts and principles of LLM-based AI agents 2. Integration platforms and development approaches 3. Enterprise implementation strategies	1, 2, 3 1.5

2	Lab/Tutorial Sessions	1. Hands-on development with LLMs 2. Integration platform implementation 3. Business solution development	1, 2, 3	1.5
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Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("- " for nil entry)	Allow Use of GenAI?
1	Weekly Hands-on Assignments (i.e., TBL Application Exercises) - Participation in class and tutorial sessions in academic activities, the quality of their answers to questions, and completion of hands-on tasks	1, 2, 3	10	-	Yes
2	Weekly Quiz (i.e., iRAT, tRAT) - Students complete weekly online quizzes to assess their understanding of LLM concepts, technical implementations, and business applications covered in lectures and labs. Each quiz includes multiple-choice and short-answer questions related to that week's material	1, 2	10	-	No
3	Individual Assignment - Development of an AI agent solution addressing a specific business need	2, 3	20	-	Yes

4	Final Capstone Project - Group project implementing a comprehensive LLM-based AI Agent business solution	1, 2, 3	20	-	Yes
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Continuous Assessment (%)

60

Examination (%)

40

Examination Duration (Hours)

2

Assessment Rubrics (AR)**Assessment Task**

Continuous Assessment – Weekly Hands-on Exercise

Criterion

1. Ability to critically explain LLM capabilities, architectures, and their business applications
2. Ability to effectively implement and configure LLM-based solutions
3. Ability to evaluate and optimize LLM performance for specific use cases

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Continuous Assessment - Weekly Quiz

Criterion

1. Understanding of LLM fundamentals and technical concepts
2. Knowledge of LLM implementation approaches and best practices
3. Application of concepts to business scenarios

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Individual Assignment

Criterion

1. Technical implementation of AI agent solution
2. Solution design and architecture
3. Documentation and code quality
4. Business value and practicality

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Final Capstone Project

Criterion

1. Comprehensive LLM solution implementation
2. Team collaboration and project management
3. Business solution viability
4. Technical documentation and presentation

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Final Examination

Criterion

1. Understanding of LLM concepts and architectures
2. Analysis of LLM implementation strategies
3. Business application knowledge
4. Problem-solving ability

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Large Language Models (LLMs); AI Agents; Prompt Engineering; LLM Integration Platforms; Enterprise AI Solutions; Fine-tuning Approaches; AI Solution Architecture; Business Process Integration; Data Privacy and Security; Performance Optimization; Scalability Strategies; Cost Management; API Integration; Enterprise Deployment.

Reading List

Compulsory Readings

Title	
1	Building LLM Powered Applications: Create intelligent apps and agents with large language models by Valentina Alto (Author)
2	OpenAI API Cookbook: Build intelligent applications including chatbots, virtual assistants, and content generators by Henry Habib
3	Mastering DeepSeek AI and R1: Building Cost-Effective, Powerful AI Solutions: Creating Scalable, Intelligent Systems with Advanced AI Models and Practical Applications by Cobbs walker
4	Mastering n8n: Automate Workflows, Build AI Agents, and Integrate APIs Like a Pro Kindle Edition by Leandro Calado (Author)

5	N8N Guide: 16 Game-Changing Lessons for Workflow Automation Success Kindle Edition by Leandro Calado (Author)
6	Ollama Crash Course: Build Local LLM powered Apps Kindle Edition by Greg Lim (Author)
7	Google Gemini AI Crash Course in One Hour: Quickstart on Gemini Pro, Gemini Vision, Google AI Studio, and More. Kindle Edition by Greg Lim (Author)
8	AI Engineering: Building Applications with Foundation Models 1st Edition by Chip Huyen (Author)

Additional Readings

Title	
1	Hugging Face: NLP Models in the Cloud: Deploy, Scale, and Integrate NLP Models Using Hugging Face's Ecosystem and Cloud Services for Real-World Applications. ... 1 (Hugging Face - NLP Models in the Cloud) Book 1 of 2: Hugging Face - NLP Models in the Cloud
2	Quick Start Guide to Large Language Models: Strategies and Best Practices for ChatGPT, Embeddings, Fine-Tuning, and Multimodal AI (Addison-Wesley Data & Analytics Series) 2nd Edition by Sinan Ozdemir (Author)
3	The Hundred-Page Language Models Book: hands-on with PyTorch (The Hundred-Page Books) by Andriy Burkov (Author)
4	Building LLMs for Production: Enhancing LLM Abilities and Reliability with Prompting, Fine-Tuning, and RAG by Louis-François Bouchard (Author), Louie Peters (Author)
5	Workflow Automation with Microsoft Power Automate: Use business process automation to achieve digital transformation with minimal code, 2nd Edition 2nd ed. Edition by Aaron Guilmette
6	Beginner's Guide to Google Apps Script 1 & 2 - Sheets & Forms (Step-by-step guides to Google Apps Script) by Barrie Roberts