



The ITNW 2327 Advanced Cloud Concepts (Capstone) has been jointly developed as an Open Educational Resources (OER) course by Collin College Cloud faculty (CC-BY-NC License). The course is 100% project-based and simulates a real-world business and technical scenario in Cloud Computing. The project primarily includes a Lift-and-Shift migration of a single tiered, on-premise virtual machine (VM) into a two-tiered solution in AWS using best practices. Appropriate Azure service(s) are used for data protection purposes, meeting multi-cloud requirements.

The course has been specifically designed to allow students the opportunity to demonstrate not only their understanding of Cloud concepts and hands-on skills in a live cloud environment, but also soft skills that are crucial to be successful in the workforce. Students are required to work individually and in teams to complete week-by-week deliverables culminating in a final presentation at the end of the course. The course uses a Scrum framework comprising of bi-weekly meetings with the instructor to ensure successful project management.

All content is available via a Canvas IMSCC package.

Week 1, Requirements Discovery Outline

Identify gaps in provided project requirements in preparation for client meeting to address gaps

Week 2, Requirements Document

Summarized project requirements including additional provided from client meeting

Week 3, Design Document

Detailed project architectural document to meet requirements

Week 4, Prototype Deployment

Demo & documentation for project application deployment

Week 5, Client Scrum Demo

Provide client demo of prototype to capture & document feedback

Week 6, Updated Deployment Guide

Incorporate client feedback & provide updated deployment document

Week 7, Final Project Documentation & Presentation

Create a project summary archive including final project presentation for client

Week 8, Final Client Demo

Provide presentation & client demo of completed project

Cloud Capstone

ITNW 2327 Advanced Cloud Concepts (WECM course)

3 credit hours

Institution: Collin College

Faculty Members: Aparna Godbole, Paul Belk

Prerequisites: AWS Academy Cloud Architecting and Azure Administrator courses

Course Description and Outcomes: Specified by WECM; Link:

<http://board.theccb.state.tx.us/apps/wecm//PubDispRegular.cfm?CRSID=16299>

Course Delivery: 8-week in-person delivery

Course Overview: The ITNW 2327 Advanced Cloud Concepts (Capstone) has been jointly developed as an Open Educational Resources (OER) course by Collin College Cloud faculty (CC-BY-NC License). The course is 100% project-based and simulates a real-world business and technical scenario in Cloud Computing. The project primarily includes a Lift-and-Shift migration of a single tiered, on-premise virtual machine (VM) into a two-tiered solution in AWS using best practices. Appropriate Azure service(s) are used for data protection purposes, meeting multi-cloud requirements. The course has been specifically designed to allow students the opportunity to demonstrate not only their understanding of Cloud concepts and hands-on skills in a live cloud environment, but also soft skills that are crucial to be successful in the workforce. Students are required to work individually and in teams to complete week-by-week deliverables culminating in a final presentation at the end of the course. The course uses a Scrum framework comprising of bi-weekly meetings with the instructor to ensure successful project management.

Disclaimer:

- The course only includes a minimalistic Disaster Recovery (DR) solution in the form of database backups to Azure due to the 8-week time frame delivery constraint.
- The hands-on portion of the project requires the use of AWS Free Tier account for students with promotional credits. The AWS Academy Learner lab environment cannot be used for project completion due to limited IAM (Identity and Access Management) capabilities.
- AWS reference labs provided with the course will need to be updated regularly as AWS makes changes to their management console based on user feedback.

Outline of week-by-week deliverables:

Students will work in teams to complete the capstone project. Outline of weekly deliverables for the student teams is as below:

Week	Deliverable	Overview
1	Requirements Discovery Outline	Identify gaps in provided project requirements in preparation for client meeting to address gaps

2	Requirements Document	Summarized project requirements including additional provided from client meeting
3	Design Document	Detailed project architectural document to meet requirements
4	Prototype Deployment	Demo & documentation for project application deployment
5	Client Scrum Demo	Provide client demo of prototype to capture & document feedback
6	Updated Deployment Guide	Incorporate client feedback & provide updated deployment document
7	Final Project Documentation & Presentation	Create a project summary archive including final project presentation for client
8	Final Client Demo	Provide presentation & client demo of completed project

Each of these deliverables are outlined below:

Requirements Discovery Outline – synthesize the provided business and technical requirements into a draft Requirements Document. Outline any gaps in provided requirements and prepare for client meeting for additional discovery meeting.

Requirement Document – provide requirements document to be used for design & deployment phases of the project. Including business and technical requirements with client provided clarifications/additions from client meeting.

Design Document – create a comprehensive design document outlining all architectural requirements including application, database, network, security, and monitoring. Deployment architecture will include a multi-cloud platform model (Amazon Web Services & Microsoft Azure). The design should include cost optimization & security hardening considerations.

Prototype Deployment Guide – define the automation templates for cloud component deployment. Including application virtual servers, database servers, network configuration, load balancers, security configuration, and the like.

Client Scrum Demo – a client demo of the existing prototype will be performed with the client representatives. Feedback will be documented and incorporated into an updated deployment guide and documentation.

Final Presentation – create a project archive including requirement document, finalized design document, updated deployment guide (including all deployment templates/code) and an accompanying client facing presentation.

Artifacts:

The artifacts developed by faculty for the Capstone course have been organized within modules as described below:

- **Instructor Resources**

- Course Overview Presentation – an overview presentation is included to assist instructors with understanding the overall course scope & methodology.
- CATME Team Tools – this is a pdf tutorial that can be used by instructors for team forming (at the start of the course) and peer evaluation (at the end of the course).
Note: Evaluation rubrics in .xlsx format have been included in this module for instructors adopting the course to make edits as needed.
- **Course Information**
 - About this Cloud course – this document provides a course overview for students.
 - Sample Course Syllabus
- **Course Resources**
 - Includes access to instructions, commands, cheat sheets, labs, and other resources that students can reference throughout the duration of the course to assist them in completing the project successfully. All resources have been assigned names that are meaningful and self-explanatory.
- **Scrum Process – Weeks 1 - 8**
 - 2020-Scrum-Guide-US – this is a guide in pdf format to help understand Scrum
 - Daily-Scrum-Log-Template and Status-Report-Template - will be used by student teams to document updates at each bi-weekly Scrum meeting with the instructor.
 - Troubleshooting-Knowledge-Base-Template - will be used by students on a weekly basis to document technical issues encountered when interacting with the live AWS environment and their solutions.
 - Scrum-Only-Rubric – a sample rubric has been provided to assist in guiding the aspects of the Scrum (project review) only sessions.
 - Scrum-with-Troubleshooting-Documentation-Rubric – a sample rubric has been provided to assist in guiding the aspects of the Scrum (project review) sessions and the updates to the overall project troubleshooting documentation deliverable.
- **Business Scenario – Weeks 1 and 2**
 - Capstone Problem Statement – provides an overview of the current scenario, migration plan, and requirements.
- **Requirements Document – Week 2**
 - Requirements-Gathering-Template – will be used by students to synthesize information from the given problem statement and to document requirements into categories - business, technical, functional, operational, etc.
 - Gap-Requirements-Gathering-Template – will be used by students to document gaps that may need clarification/direction from the client; will be merged into the master Requirements document following clarification from the client.
 - Meeting Minutes Template – will be used to record decisions and key takeaways from the client meeting including any action items and deadlines.
 - Requirements-Doc-Rubric – evaluation rubric for Requirements Gathering
- **Design Document – Week 3**
 - Design-Doc-Template – will be used by students to formulate and document the overall project architecture including all build documentation (tooling, scripts/automation) for the deployment.
 - Design-Doc-Rubric – evaluation rubric for the Design Document

- **Delivery Document – Week 4 and 5**
 - Client Demo Meeting Minutes – a template provided to assist in the capturing of client feedback from the project demo – these will then be mapped to the appropriate documentation updates (requirements, design, etc.) and subsequent architectural changes.
 - Demo-Rubric – evaluation rubric for the Demo components of this phase of the project
 - Acceptance Test Plan (ATP) Instructions – overall instructions and guidance on the requirements for the ATP to exercise and document the expected test cases and their successful outcomes.
 - UAT Test Case Templates – examples provided in Word document and Excel workbook format to assist students in defining and capturing their ATP test cases and results.
- **Cost Modeling – Week 6**
 - Cost-Model-Template – includes cost calculations, architectural diagram and AWS component summary, and monthly cost estimates for the solution using the AWS Pricing Calculator; will be completed by each student team.
 - Formulas for Cost Calculations on AWS – will be used as a reference by students to perform their cost calculations on AWS.
 - Costing-Rubric – evaluation rubric for Cost Modeling
- **Project Presentation – Weeks 7 and 8**
 - Pitch Deck Template Example – example of a project presentation deck. Additionally, links to other Microsoft Powerpoint presentation decks are provided to allow students the freedom to select the one most appropriate to their project.
 - Presentation-Rubric – an evaluation rubric for the Project Presentation
- **Final Deliverables – Week 8**
 - Assignments for students to submit their final deliverables for the Capstone project including:
 - Requirements Document
 - Design Document
 - Cost Model
 - Demo
 - Acceptance Test Plan Document
 - Project Presentation
 - Troubleshooting Knowledge Base Document

