

Power Platform Master Class

Building Custom Solutions with Power Apps and Power Automate

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| Course Code | PPMC |
| Audience | Citizen Developers and Technical Professionals |
| Format | Self-paced |
| Length | 24 Hours <i>(includes 12 hours of viewing recording lectures and 12 hours of hands-on lab exercises)</i> |
| Course Description | <p>Power Platform Master Class is an intensive, hands-on training class designed for students who already have experience with Power Apps and Power Automate and are looking to move their solution building skills to the next level. The class teaches best practices in building canvas apps and designing flows to update and manage content in SharePoint Online, Excel workbooks and Azure SQL. Students will learn advanced builder techniques including creating a canvas app with shopping cart functionality and designing flows to generate business documents and automate approvals.</p> <p>This course also introduces the Common Data Service (CDS) and teaches students how to build business solutions using model-driven apps and custom entities. The class also explains how to package and deploy apps, flows and customizations using CDS solutions. Along the way, students will learn about Power Apps Portals and the Power Platform integration with Power BI.</p> |
| Student Prerequisites | All students will require a Windows PC for lab exercises running Windows 10 or Windows 8.1. Students should already be familiar with Microsoft Excel, Office 365 and SharePoint Online. Due to the accelerated nature of this training class, it is also recommended that students attend Microsoft's App-in-a-day training before taking this class or have the equivalent hands-on experience with Power Apps and Flow. |

Course Modules

1. **Getting Started with the Power Platform**
2. **Building Data-driven Canvas Apps**
3. **Building a Canvas App with a Shopping Cart**
4. **Getting Started with Power Automate**
5. **Building Flows to Manage Content and Approvals**
6. **Integrating PowerApps with External Systems**
7. **Getting Started with the Common Data Service**
8. **Designing and Developing PowerApps Portals**
9. **Integrating PowerApps with Power BI**

Module 01: Getting Started with the Power Platform

This module introduces students to the Microsoft Power platform and explains the role of canvas apps, connectors and flows in building business solutions. The module introduces the Common Data Service for Apps (CDSA) and explains how it provides support for creating custom entities and building model-driven apps. Students will create canvas apps with Power Apps Studio and learn to write advanced expressions for screen and control properties. The module examines connectors and data binding and demonstrates using the Start with Data template. Along the way students will learn to build a canvas app for mobile devices that reads and writes customer data to a table inside an Excel workbook in OneDrive for Business.

Topics Covered

- Getting Started with the Power Platform
- Creating Canvas Apps
- Writing Power Apps Expressions
- Working with Connectors and Data Binding
- Understanding Delegation

Hands-on Lab: Getting Started with Power Apps Studio

- Exercise 1: Setup a Power Apps Builders Environment
- Exercise 2: Sign Up for an Office 365 E5 Trial
- Exercise 3: Create a Canvas App using the Start From Data Template
- Exercise 4: Test the Expense Tracker Application From a Mobile Device
- Exercise 5: Create a Canvas App using the Start from Blank Template

Module 02: Building Data-driven Canvas Apps

This module teaches students the best practices for building data-driven canvas apps using connections, galleries, item templates, forms and data cards. Students will learn best practices for tracking application state using global variables, context variables and collections. The module introduces students to the principles of delegation and explains how to filter, sort and search through a large Azure SQL database tables and a large SharePoint lists without compromising performance. Students will learn how to build a user experience to add and update data using edit forms and data cards. The module concludes with an examination of the PowerApps integration feature with SharePoint Online which makes it possible to customize the SharePoint list forms to provide business users with an enhanced user experience for editing content in a SharePoint Online.

Topics Covered

- Screen Design Guidelines
- Displaying Repeating Data using Galleries
- Using Table Functions to Filter and Sort Data
- Updating Data using Edit Forms and Data Cards
- Customizing SharePoint List Forms

Hands-on Lab: Building a Data-driven Canvas App

- Exercise 1: Create a SharePoint List to Store Customer Data
- Exercise 2: Create the Customer Ordering Canvas App
- Exercise 3: Implement the Browse Customers Screen
- Exercise 4: Implement the Add Customer Screen
- Exercise 5: Implement the Edit Customer Screen
- Exercise 6: Integrate a Custom Connector to Provide New Customer Data

Module 03: Building a Canvas App with a Shopping Cart

This module examines building a canvas app which allows users to browse a set of products and to add products into a shopping cart tracked using a local collection. Students will learn how to implement the required data access behavior for writing the shopping cart data out to an Azure SQL database or to a SharePoint list. The module examines techniques required to update data across two tables at once for scenarios where adding an Order record also requires adding multiple OrderDetail records with the primary key of the parent Order record. The module concludes with an examination of using PowerApps Studio to create Reusable Components which can be exported and shared across multiple canvas apps.

Topics Covered

- Caching State using Variables and Collections
- Using a Collection to Track Shopping Cart Data
- Using Patch Instead of an Edit Form
- Writing Shopping Cart Data to Back to SharePoint
- Designing Reusable Components

Hands-on Lab: Building a Shopping Cart for Processing Orders

- Exercise 1: Create The Browse Products Screen
- Exercise 2: Implement Shopping Cart Collection for Ordering Products
- Exercise 3: Create SharePoint Lists for Orders and Order Details
- Exercise 4: Create the Submit Order Screen
- Exercise 5: Create the Order Confirmation Screen (If you have time)

Module 04: Getting Started with Power Automate

This module introduces the fundamental concepts of Power Automates (aka Microsoft Flow) and gets students started building and testing flows in the Microsoft Flow design editor. Students will learn how to use flow triggers to build flows that can be scheduled, executed in response to external events or run on demand using a button on a mobile device. The module explains how data within a flow is propagated from step to step and discusses how to use control-of-flow actions to author advanced business logic. Students will learn the syntax for writing advanced expressions in Workflow Definition Language (WDL) to retrieve dynamic content, to perform type conversion and to design flows using loops, variables, arrays and custom objects.

Topics Covered

- Power Automate Fundamentals
- Creating and Testing Flows
- Using Control-of-Flow Actions
- Writing Flow Expressions
- Automating Document Generation

Hands-on Lab: Getting Started with Power Automate

- Exercise 1: Create and Test a Flow with Flow Button Trigger
- Exercise 2: Create a New Twitter Account for Testing Purposes
- Exercise 3: Create a Flow to Track Twitter Data in an Excel Workbook
- Exercise 4: Create a Flow to Generate a Word Document from a SharePoint List Item

Module 05: Building Flows to Manage Content and Approvals

This module focuses on using Microsoft Flow to update, manage and transform content in SharePoint Online and OneDrive for Business. The module demonstrates how to build a scheduled flow to enumerate the items in a SharePoint list to clean up and validate the data entered by business users. Students will learn build flows that upload documents and images to SharePoint Online and OneDrive for Business and to convert document content between common file formats such as JSON, XML, HTML and CSV. The module demonstrates building flows to automate the generation of Word documents and PDF files using the using the Word Online connector. This module examines the support in Microsoft Flow for automating an approval process using the Start an Approval action. Students will learn how to build flows to automate an approval process including document approval in SharePoint Online.

Topics Covered

- Converting and Reshaping Data
- Uploading Photos to SharePoint
- Automating Approval Processes
- Integrating Flow with Microsoft Forms
- Handling Runtime Errors
- Understanding Parallel Execution

Hands-on Lab: Managing Content and Approvals with Power Automate

- Exercise 1: Create Two SharePoint Document Libraries for Uploading Photos
- Exercise 2: Create a New Canvas App to Upload Photos to SharePoint
- Exercise 3: Create A Flow to Automate a Photo Approval Process
- Exercise 4: Test the Photo Approval Flow

Module 06: Integrating PowerApps with External Systems

This module examines how to integrate data from external systems and on-premises data sources. Student will learn to build flows with the HTTP action to call external web services and to parse JSON from an HTTP response. The module also explains how to build flows with HTTP triggers which can be used to process forms and surveys created using Microsoft Forms. The module explains the purpose of custom connectors and examines real-world scenarios in which they are required. The module introduces students to swagger file definitions and demonstrates using the PowerApps portal to create a custom connector to communicate with a custom web service. The module demonstrates creating custom connectors which can handle OAuth2-style authentication with web services protected by Azure AD such as the Microsoft Graph API and the Power BI Service API. The module concludes with a discussion of how to install and configure an On-premises Data Gateway which makes it possible for canvas apps and flows to read and write data from on-premises data sources such as SQL Server and local SharePoint farms.

Topics Covered

- Calling External Services using HTTP Actions
- Executing Child Flows from a Parent Flow
- Creating and Testing Custom Connector
- Configuring a Custom Connector to use OAuth

Hands-on Lab: Integrating Power Apps with External Systems

- Exercise 1: Use the HTTP Connector to Retrieve Data from an External Web Service
- Exercise 2: Execute a Child Flow from a Parent Flow
- Exercise 3: Create a Custom Connector for an External Web Service

Module 07: Getting Started with the Common Data Service

This module introduces the Common Data Service for Apps (CDSA) and explains how it provides a standardized database schema for business data used by PowerApps, Flow and Dynamics 365. Student will learn how to import external data into the CDSA and how to build canvas apps to read and write records for standard entities such as accounts, contacts and activities. The module teaches students how to customize standard entities as well as how to create custom entities to accommodate specific business scenarios.

Topics Covered

- Common Data Service Overview
- Creating the CDS Database
- Understanding Entities
- Importing Data into the CDS Database
- Building Model-driven Apps
- Creating a Custom Entity

Hands-on Lab: Working with the Common Data Service

- Exercise 1: Create a New PowerApps Environment with a CDS Database
- Exercise 2: Inspect Standard Entities in the Common Data Service
- Exercise 3: Create a Canvas App to Manage Contact Entity Data
- Exercise 4: Create a Model-driven App to Manage Contact Entity Data
- Exercise 5: Import the Product Management Solution

Module 08: Designing and Developing PowerApps Portals

This module introduces students to the Microsoft Power platform and explains the role of canvas apps, connectors and flows in building business solutions. The module introduces the Common Data Service for Apps (CDSA) and explains how it provides support for creating custom entities and building model-driven apps. Students will create canvas apps with PowerApps Studio and learn to write advanced expressions for screen and control properties. The module examines connectors and data binding and demonstrates using the Start with Data template. Along the way students will learn to build a canvas app for mobile devices that reads and writes customer data to a table inside an Excel workbook in OneDrive for Business.

Topics Covered

- PowerApps Portal Architecture
- Portal Editor
- Portal Management App
- Portal Configuration
- Developing Web Templates

Hands-on Lab: Developing a Power Apps Portal

- Exercise 1: Add Content to the Portal using Power Apps Portal Studio
- Exercise 2: Configuring a Power Apps Portal using the Portal Management App

Module 09: Integrating PowerApps with Power BI

This module examines the points of integration between Power BI, PowerApps and Flow. Students will learn how to embed Power BI dashboard content in PowerApps using the Power BI tile control. The module also explains how to embed a canvas app in Power BI reports using the PowerApps custom visual. Students will learn how to pass data from a Power BI report to an embedded canvas app using a design that allows the app to respond to filtering changes in the report. The module examines how to build real-time dashboards in Power BI by designing flows that push rows of data into Power BI automatically triggering updates to dashboard tiles. Students will practice what they learned in the lecture by building a real-time dashboard to monitor Twitter and to display tweets containing specific keywords.

Topics Covered

- Overview of Power BI Integration Features
- Embedding Power BI Dashboard Tiles in PowerApps
- Extending Power BI Reports using Canvas Apps
- Designing Flows to Update Real-time Dashboards
- Triggering Flows using Power BI Dashboard Alerts

Hands-on Lab: Integrating Power BI with PowerApps and Flow

- Exercise 1: Adding Power BI Content to a New App Workspace
- Exercise 2: Embed Power BI Dashboard Tiles in PowerApps
- Exercise 3: Extend a Power BI Report using PowerApps
- Exercise 4: Use a Flow to Create a Real-time Dashboard in Power BI