TRAINING

U2U

.NET 9
AZURE
PYTHON
ANGULAR
POWER BI
SQL SERVER
MICROSOFT 365
POWER PLATFORM
MICROSOFT FABRIC

COURSE AGENDA **OCTOBER 2024 - APRIL 2025**

U2U DEVELOPER AND IT TRAINING

U2U has more than 20 years of experience in offering high-quality courses led by expert trainers in their respective fields. U2U courses equip developers, IT professionals, data specialists and business users with the skills to excel in web, cloud, infrastructure, data and AI technologies.

HIGH-QUALITY COURSES

We develop our own courses and constantly update them to include the latest features. We provide you with a printed and digital copy of the material. Enjoy a mix of theory, live demonstrations and exercises.

OUR TRAINERS

All our trainers are skilled full-time presenters who make the most challenging subjects easy to understand.

IN-CLASS TRAINING

Experience our instructor-led courses in our spacious training center in Brussels. Benefit from learning in small groups with the guidance of highly experienced and qualified trainers.

TUNE IN REMOTELY

Engage in our instructor-led courses from anywhere. Follow the classroom-based course and the trainers' activity through our video conferencing system and Microsoft Teams.

LEARNING PORTAL

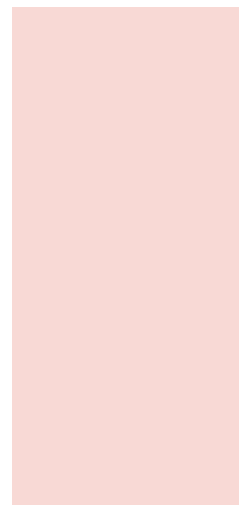Access our lab and learning environment during and after your training.

TABLE
OF CONTENTS

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CONTACT

OPEN ENROLMENT
COURSES

Our open enrolment courses are regularly organized **at our training center in Brussels**. Our courses are conducted in **English** by our highly skilled and experienced instructors.

To facilitate online training, all our classrooms are fully equipped with the necessary hardware for remote learning, accommodating both in-person and online participants at the same time. This setup ensures frequent and meaningful interaction between the trainer and the remote participants, replicating the experience of being physically in the classroom.

DELIVERY FORMATS

Classroom
- Classroom-based instructor-led courses.
- Organized in our spacious training center in Brussels.
- Face-to-face interaction with highly qualified and experienced instructors.
- Course manual, preconfigured laptop, lunch, coffee and beverages are included.

Remote Classroom
- Participate remotely in our classroom-based courses.
- Follow the presentation and trainer's activities through the camera system from anywhere in the world.
- Interact with our trainer, similar to a physical classroom.
- Participate in exercises with a ready-to-use lab and learning environment.

AVAILABLE DISCOUNTS

- **10% discount** if you bring your own laptop to the classroom-based course.
- **15% discount** for 14-Day Advance Payment. Registration under this option is final and cannot be refunded or cancelled.
- **15% discount** for the second participant. **25% discount** for the third and subsequent participant from the same company attending the same course session.

50% DISCOUNT?

Reserve spots for several participants in a single course session and enjoy discounted rates. The first participant can save up to 25%, the second up to 40%, and starting from the third participant, enjoy savings of up to 50%.

Your group's total price for a 5-day classroom-based course will be:

First participant: 2100€ - 25% = 1575€
Second participant: 2100€ - 40% = 1260€
Third participant: 2100€ - **50%** = 1050€

Total for 3 participants: 3885€ (instead of 6300€)

IN-COMPANY COURSES

Private company courses offer a cost-effective and convenient option for businesses looking to train a **group of people**. We offer in-company courses in **Dutch, English or French** tailored to meet the specific needs of your company.

WHAT YOU WANT

The course content can be **fully tailored to meet your needs**. To optimize your time and to make the most out of the course, you can choose the duration and topics that you wish to include.

WHERE YOU WANT

The courses can be organized **in our training center, your offices, online or at a location of your choice** across Europe and the Middle East. We will provide the course material and the ready-to-use lab environment.

PRICES

Our group price starts at 4600 € for a 3-day in-company training session for up to 10 participants.

What is included in our price?

- The price includes organizing the training either online or on-site in your classrooms.
- The course content can be adapted to your needs at no extra cost.
- All course materials for up to 10 participants are included.
- For more than 10 participants, an additional fee per extra participant applies.

Please contact us for an exact price quote and more information about our terms and conditions.

KMO PORTEFEUILLE

Dankzij de subsidiemaatregel van de Vlaamse overheid, de kmo-portefeuille, kan u voor uw opleiding tot 30% subsidies ontvangen. Het registratienummer van U2U voor de pijler opleiding binnen het thema Digitalisering is DV.O213569.

DIENSTVERLENER VOOR DE
KMO-PORTEFEUILLE

SCHEDULE OCTOBER 2024 - APRIL 2025

.NET

.NET		Price	Days	Oct	Nov	Dec	Jan	Feb	Mar	Apr
.NET PROGRAMMING										
UCSPR	Object-Oriented Programming in C#	2100€	5		18		13	24		14
UNOOP	Advanced Object-Oriented Programming Techniques in .NET	2100€	5			9		3		7
WEB DEVELOPMENT										
UBLZ	Full Stack Development with C# and Blazor	2100€	5		25		27		10	
UNASP	Building Web Applications with ASP.NET	2100€	5		25		20		17	
UWAPI	Building ASP.NET Web APIs	2100€	5	7		2		3	24	
UWEBA	Advanced .NET 9 Web Development	2100€	5		4		13		17	
UWSEC	Web Security Development Techniques	1400€	3	7			27		24	
ENTERPRISE & ARCHITECTURE										
UARCH	.NET Best Practices: Architecture & Design Patterns	2100€	5	14	25			17		14
UDEF	Domain-Driven Design with Entity Framework Core	1400€	3			16		10		28
UTEST	Effective Unit Testing	950€	2		21		16		27	
UGIT	Version Control and Team Collaboration with Git	450€	1	23		16			3	28
WINDOWS & MOBILE DEVELOPMENT										
UWPF	Building Windows Applications with WPF	2100€	5	14					3	
UMAUI	Building Mobile Apps with .NET MAUI	2100€	5	21			20		31	

MICROSOFT AZURE

MICROSOFT AZURE		Price	Days	Oct	Nov	Dec	Jan	Feb	Mar	Apr
AZURE DEVELOPMENT										
UAWEB	Developing & Deploying Web Apps on Microsoft Azure	2100€	5	14		2		3	31	
UASPI	Developing Distributed Applications with Azure and .NET Aspire NEW	1400€	3			9		3	31	
UACA	Microsoft Azure Architecture Master Class - Development	1750€	4		18		27		24	
AZURE INFRASTRUCTURE										
UAZUREA	Microsoft Azure Infrastructure Services	2100€	5		18		27		17	
AZ-700	Designing and Implementing Microsoft Azure Networking Solutions	1400€	3		19		28		18	
UAIA	Microsoft Azure Architecture Master Class - Infrastructure	1750€	4	28			20			22
UAAD	MMicrosoft Entra ID Identity Management	1400€	3			9			3	28
UACON	Managing Containers with Kubernetes and Microsoft Azure	1400€	3	14		16		24		
UAIC	GitOps: Infrastructure as Code with GitHub	1400€	3		12		27		31	
UASEC	Securing and Monitoring Microsoft Azure	950€	2		28		16		13	
UCSEC	Mastering Microsoft Cloud Cybersecurity	2100€	5		25		13		10	
AZURE DATA PLATFORM										
UASQL	Administering Azure SQL Databases	1750€	4			16		24		22
UASQLD	Developing Azure SQL Databases	2100€	5		4		20		10	
UADE	Data Engineering on Microsoft Azure	2100€	5			9		10		7
UASA	Data Engineering with Azure Synapse Analytics	2100€	5			9		10		7
UFAB	Data Engineering with Microsoft Fabric NEW	2100€	5	21			20		17	
UADB	Data Engineering with Azure Databricks NEW	1750€	4		25			3		14
UPDE	Python for Data Engineers: From Syntax to Solutions	1400€	3	7		2	27		24	
UPUR	Data Governance with Microsoft Purview	950€	2		25				6	
AZURE AI										
UADAI	Developing AI-Powered Apps with C# and Azure AI	1400€	3	28		16		17		7
UADS	Building your own Models with Azure Machine Learning NEW	950€	2	14			30		27	
UAMAI	Developing AI-Powered Apps with Python and Azure AI Studio NEW	1750€	4			9		24		22
AZURE DEVOPS										
UTFS	Team Development with Azure DevOps	1400€	3	23		16			3	28
AZ-400	Designing and Implementing Microsoft DevOps solutions	1750€	4	28		2		10		22
UGIT	Version Control and Team Collaboration with Git	450€	1	23		16			3	28
UAIC	GitOps: Infrastructure as Code with GitHub	1400€	3		12		27		31	
AZURE FUNDAMENTALS										
AZ-900	Microsoft Azure Fundamentals	450€	1	31					7	

JAVASCRIPT

JAVASCRIPT		Price	Days	Oct	Nov	Dec	Jan	Feb	Mar	Apr
WEB FUNDAMENTALS										
UJSDEV	JavaScript Fundamentals	1400€	3	9		4	12			16
UJSWEB	Programming with JavaScript, HTML and CSS	2100€	5	7		2		10		14
JAVASCRIPT FRAMEWORKS										
UANG	Building web apps with Angular and TypeScript	1400€	3	16		16	17			22
UANGA	Mastering Angular	1400€	3				13		3	
UREACT	Developing Web Apps with React	1400€	3		18		22			7
UVUE	Building Web Apps with Vue.js	950€	2							28

All courses scheduled at U2U Brussels are conducted in English. The course hours are from 9:30 to 16:45 on the first day and from 9:15 to 16:45 on subsequent days.
All prices are listed in euros and do not include 21% VAT. These prices are applicable to all courses scheduled and organized at the U2U training center in Brussels, and are valid for bookings made between October 1, 2024, and January 1, 2025.
The price includes high-quality lectures, a preconfigured laptop for hands-on exercises, a U2U course book, as well as lunch, snacks, coffee, and drinks during the course.

MICROSOFT 365

		Price	Days	Oct	Nov	Dec	Jan	Feb	Mar	Apr
MICROSOFT 365 ESSENTIALS										
USPOP	SharePoint Online for Power Users	2100€	5	14		2	20		3	14
U0365P	Office 365 Essentials	1400€	3		25			24		
UPOWER	Microsoft Power Apps and Power Automate	1750€	4	28		16		3	24	
UPILOT	Building your Own Copilot with Copilot Studio NEW	950€	2	10		5	30		20	
UM365AI	Building Smart Solutions with AI Builder and Microsoft Syntex	950€	2		21			6		14
MS-900	Microsoft 365 Fundamentals	450€	1			6		14		18
MICROSOFT 365 DEVELOPMENT										
USPOAP	Modern Microsoft 365 Development new	1750€	4			16		24		22
USPFX	Developing with the SharePoint Framework	2100€	5		4		27			7
MICROSOFT 365 ADMINISTRATION										
U0365A	Configuring & Administering Microsoft 365	1750€	4			9		3	31	
MS-700	Managing Microsoft Teams	1400€	3		20			10		
UINT	Microsoft Endpoint Manager: Configuring Devices with Microsoft Intune	1400€	3		18		13			28
MICROSOFT 365 SECURITY AND COMPLIANCE										
UMSEC	Microsoft 365 Cloud Security	1400€	3		25		13		10	
UCSEC	Mastering Microsoft Cloud Cybersecurity	2100€	5		25		13		10	
SC-400	Administering Information Protection and Compliance in Microsoft 365	1400€	3		12			17		22

POWERSHELL

		Price	Days	Oct	Nov	Dec	Jan	Feb	Mar	Apr
POWERSHELL										
UPSHELL	Scripting with PowerShell	1400€	3	21		2		3	24	
UPSHELLA	Mastering PowerShell	2100€	5	21		2		3	24	
UPSHELLG	Mastering Microsoft Graph PowerShell NEW	950€	2	3		12		27		

WINDOWS SERVER

		Price	Days	Oct	Nov	Dec	Jan	Feb	Mar	Apr
WINDOWS SERVER										
AZ-800	Administering Windows Server Hybrid Core Infrastructure	2100€	5		4			10		14

POWER BI

		Price	Days	Oct	Nov	Dec	Jan	Feb	Mar	Apr
POWER BI ESSENTIALS										
UBIPBE	Analyzing your data with Power BI for Business Users	1400€	3		7	25		27		
UBIPB	Analyzing your data with Power BI for BI Professionals	2100€	5		21		9		10	
POWER BI ADVANCED										
UDAX	Mastering DAX	1400€	3		12	16		17		22
UPBIM	Managing a Power BI Environment	1400€	3	17		16		6		10
UPBIDM	Designing Data Models for Power BI	950€	2		6		13		24	
PAGINATED REPORTS										
UPBIPR	Creating Power BI Paginated Reports NEW	950€	2			12		13		22

POWER PLATFORM

		Price	Days	Oct	Nov	Dec	Jan	Feb	Mar	Apr
POWER APPS & POWER AUTOMATE										
UPOWER	Microsoft Power Apps and Power Automate	1750€	4	28		16		3	24	
UPPA	Power Apps and Power Automate: Advanced Patterns NEW	1400€	3		12		13		17	
UPPG	Power Platform ALM and Governance Strategies NEW	1400€	3	28			20		24	
MICROSOFT DATAVERSE										
UCDS	Model-Driven Apps with Microsoft Dataverse in Power Apps	2100€	5	21		9		3	31	
UPAP	Create Low-code Business Websites with Microsoft Power Pages	1400€	3				27			7
MICROSOFT DATAVERSE DEVELOPMENT										
UCDSD	DDeveloping for the Power Platform with Microsoft Dataverse	2100€	5		4		13		24	
AI BUILDER										
UPILOT	Building your Own Copilot with Copilot Studio NEW	950€	2	10		5	30		20	
UM365AI	Building Smart Solutions with AI Builder and Microsoft Syntex	950€	2		21			6		14

SQL SERVER

		Price	Days	Oct	Nov	Dec	Jan	Feb	Mar	Apr
MICROSOFT SQL SERVER										
UTSQL	Querying SQL Server with Transact-SQL	1400€	3		18		13		10	28
USQLD	Developing and Optimizing SQL Server Databases	2100€	5		4		20		10	
USQLA	Administering Microsoft SQL Server Databases	2100€	5		18		27		31	
USQLOP	SQL Server Performance Tuning and Optimization	2100€	5	14		2		24		14
AZURE SQL										
UTSQL	Querying SQL Server with Transact-SQL	1400€	3		18		13		10	28
UASQLD	Developing Azure SQL Databases	2100€	5		4		20		10	
UASQL	Administering Azure SQL Databases	1750€	4			16		24		22
USQLOP	SQL Server Performance Tuning and Optimization	2100€	5	14		2		24		14
SQL SERVER BUSINESS INTELLIGENCE										
USQLIS	Implementing Data Warehouses with Integration Services	2100€	5					17		

02 DAYS
UPILOT

10 - 11 October 2024
5 - 6 December 2024
30 - 31 January 2025
20 - 21 March 2025

LEARNING GOALS
This course gets you up and running with Microsoft Copilot Studio so you can quickly start building your own customized copilot.

TARGET AUDIENCE
No prior knowledge is required.

BUILDING YOUR OWN COPILOT WITH COPILOT STUDIO

INTRODUCTION TO THE MICROSOFT COPILOT STUDIO
The Vision behind Copilot Studio. Why build copilots? Copilot for Microsoft 365. Copilot Studio licensing. An introduction to Environments. Getting started with Copilot Studio.

ADDING KNOWLEDGE SOURCES TO A COPILOT
Overview of Knowledge Sources. Adding Web Site Knowledge. Adding Document Knowledge. Adding Dataverse Knowledge. Adding Knowledge via Graph Connectors. Edit Knowledge Sources. Configuring Generative AI in a copilot. Test Knowledge Sources.

ENHANCING COPILOTS WITH ACTIONS
Working with Actions. Calling a Connector Action. Use and build Power Automate Actions. Orchestrate Actions using Generative AI. Configuring Inputs and Outputs for an Action. Working with Power FX and Adaptive Cards. Extend existing Microsoft 365 copilots with custom Actions and Libraries.

WORKING WITH TOPICS
What are Topics? Create and edit Topics. Defining effective Trigger Phrases. Add Inputs and Outputs to a Topic. Sending Messages and asking Questions in a Topic. Branching and Looping. Working with Variables. Calling Actions from Topics. Orchestrate Topics and Actions using Generative AI.

ENHANCING TOPICS
Creating and using Entities. Implementing Slot Filling. Working with Power FX. Working with Adaptive Cards. Add User Authentication. Make HTTP Requests.

PUBLISHING AND MONITORING A COPILOT
Setup Authentication for your copilot. Customize the look and feel of your copilot. Publish a copilot to Microsoft 365. Publish a copilot to external sites. Analyze copilot Usage and Performance Analyze Customer Satisfaction.

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02 DAYS
UM365AI

21 - 22 November 2024
6 - 7 February 2025
14 - 15 April 2025

LEARNING GOALS
In this course, you will learn how to train and use AI models and integrate these with your own Power Apps or Power Automate flows.

TARGET AUDIENCE
This course is targeted at IT Professionals and Business users who want to learn how to extend the functionalities in the Power Platform & SharePoint with the help of Artificial Intelligence.

BUILDING SMART SOLUTIONS WITH MICROSOFT 365 AI BUILDER AND MICROSOFT SYNTEX

WHAT IS ARTIFICIAL INTELLIGENCE
What is AI? How to use AI Efficiently.

INTRODUCING AI BUILDER IN POWER PLATFORM
What is AI Builder. Introducing the Power Platform. Licensing Requirements for AI Builder. AI Builder Custom and Prebuilt Models.

TRAIN YOUR MODEL WITH MICROSOFT DATAVERSE
Discovering Text-based AI Models: Text Translation, Entity Extraction... What is Microsoft Dataverse? Loading data in Microsoft Dataverse Tables. Train your Model.

USING AI MODELS IN POWER PLATFORM
AI Builder in Power Automate. AI Builder as Canvas Apps Controls. AI Builder and Power FX.

PREDICTION MODELS
Import Structured Data in a Table. Predict Future Outcomes. Use Model Results Throughout Microsoft 365.

IMAGE DETECTION MODELS
Classifying vs Detecting Models. Train a model by Classifying and Detecting Images. Using Image Detection Models in Microsoft 365.

DOCUMENT-BASED MODELS
Different Document Processing Models. Collect Data and Train Model. Use any Model in Apps or Flows.

MANAGING AI BUILDER MODELS
Manage, Retrain and Publish Models. Share and Distribute your Model. Continuously Improve your Model. Secure your AI Models with Role Based Security.

SHAREPOINT DOCUMENT PROCESSING IN MICROSOFT SYNTEX
Microsoft Syntex Introduction. Microsoft Syntex Model Types. Structured Document Processing. Classify and Detect Unstructured Data. Implement and use Models in SharePoint. Document translation and other Syntex features.

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02 DAYS
UADS

14 - 15 October 2024
30 - 31 January 2025
27 - 28 March 2025

LEARNING GOALS
In many AI solutions pre-trained models (such as chat-GPT) are used. But in some cases, custom models trained on your corporate data is essential to make predictions within your business processes. This training focusses on the latter.

TARGET AUDIENCE
This training aims at people with basic Python knowledge who want to start or further grow in a data science role.

BUILDING YOUR OWN MODELS WITH AZURE MACHINE LEARNING

MACHINE LEARNING INTRODUCTION
Supervised versus Unsupervised Machine Learning. Why use Machine Learning? Machine Learning Methodology CRISP-DM. Data Preparation. Training, Validation and Test sets. Classification, Regression and Clustering. Measure Model Quality. Machine Learning in the Microsoft AI Stack

SETUP YOUR ENVIRONMENT
Configuring your Environment. Working with Python in Notebooks. Using Environments and Notebooks in Microsoft Fabric.

PREPARE YOUR DATA FOR MACHINE LEARNING
Exploring the scikit-learn package. Estimators and Transformers. One-Hot encoding for categorical data. LabelEncoder and OrdinalEncoder. Dealing with missing values. Handling outliers. Standardization and Normalization for continuous values. Preparing free text fields.

BUILD YOUR OWN MACHINE LEARNING MODEL WITH SCIKIT-LEARN
Classification. Decision Trees, Logistic Regression and Support Vector Machines. Model tuning: Working with Hyper-Parameters Regression Models. Linear Regression and Neural networks. Unsupervised learning: Clustering.

AZURE MACHINE LEARNING
Azure Machine Learning overview. Create an Azure Machine Learning Workspace. Setting up Compute and Datastores. Creating and Querying Jobs and Experiments. Deploying and Using Models. Creating and Registering Images. Deploy Images as Web Services.

MICROSOFT FABRIC DATA SCIENCE
Scale out your machine learning with SparkML. Log your machine learning with MLFlow in Experiments. Microsoft Fabric Model Management. FLAML: Automated machine learning in Microsoft Fabric.

AUTOMATED MACHINE LEARNING
Building and Deploying Automated ML models. Calling Automated ML from Python.

USING KERAS FOR DEEP LEARNING
From Neural networks to Deep learning. Overview of Deep Learning Frameworks. Getting started with the Keras Framework.

DEVELOPING AI-POWERED APPS WITH C# AND AZURE AI

03 DAYS
UADAI

WHAT IS ARTIFICIAL INTELLIGENCE?
Definitions of Artificial Intelligence. Domains of Artificial Intelligence. History, Current State and Future.

INTRODUCTION TO AZURE AI STUDIO AND AZURE AI SERVICES
What is Azure AI Studio? Creating Azure AI Services in Azure AI Studio. Accessing Azure AI Services. Collaborating efficiently and effectively on AI projects.

AZURE AI LANGUAGE
Conversational Language Understanding. Intents, Entities and Utterances. Key Phrase Extraction. Named Entity Recognition. Language Detection. Sentiment Analysis and Opinion Mining.

AZURE AI VISION
Getting Started with Azure AI Vision. Optical Character Recognition (OCR). Face Detection and Face Recognition. Azure AI Custom Vision.

AZURE AI DOCUMENT INTELLIGENCE
What is Azure AI Document Intelligence ?. Using Document Intelligence Studio. Working with Document Analysis Models. Creating a Custom Model. Using Models in Code.

AZURE OPENAI AND CHATGPT FUNDAMENTALS
Introducing Azure OpenAI and ChatGPT. The Transformer Model and Embeddings. Azure OpenAI Studio. Configuring Deployments. ChatGPT, GPT Models and Large Language Models. Understanding Tokens. LLM Pricing. Role Management: System, User and Assistant. Guide to Effective Prompt Engineering. Zero, One- and Few-Shot Prompting.

THE CHAT COMPLETIONS API
An introduction to the Chat Completions API. Azure OpenAI SDK. OpenAI Function Calling Explained.

USING YOUR OWN DATA IN A LLM WITH AZURE AI SEARCH
What is Azure AI Search? Retrieval Augmented Generation. Creating an Index on your Own Data. Introduction to Embeddings and Vector Search. AI Enrichment with your own Data. Using the Azure OpenAI SDK. Privacy Concerns. Fine-tuning vs RAG.

ORCHESTRATING AI MODELS USING SEMANTIC KERNEL
An Introduction to Semantic Kernel. Integrating LLMs in your applications. Keeping track of Token Usage. Enable AI Models to execute code using Plugins. Solve complex problems through use of Planners.

28 -30 October 2024
16 - 18 December 2024
17 - 19 February 2025
7 - 9 April 2025

LEARNING GOALS
The Azure AI Services bring AI at the fingertips of any software developer without having to be a data scientist. Add the 'wow'-factor to your application and gain insights into the workings of AI.
In this course you are taken through all relevant topics to integrate the Azure AI services in your software development projects. The focus of this course is on the pre-built AI services in Microsoft Azure.

TARGET AUDIENCE
This course targets professional developers that want to get started with the Microsoft AI platform. Participants of this course need to have a decent understanding of .NET and preferably some experience with Microsoft Azure. This is not a course for data scientists who want to build their own AI models or understand how existing AI models work.

DEVELOPING AI-POWERED APPS WITH PYTHON AND AZURE AI STUDIO

04 DAYS
UAMAI

INTRODUCTION TO AZURE AI STUDIO
What is Azure AI Studio? Collaborative AI Development. Developing and Testing AI Solutions in Hubs. Deploying AI Applications with Projects. Managing Resources and Projects.

READY-TO-USE AI MODELS WITH AZURE AI SERVICES
Azure AI Services Overview. Azure AI Language. Azure AI Vision. Azure AI Speech. Azure AI Document Intelligence.

AZURE OPENAI AND LARGE LANGUAGE MODEL FUNDAMENTALS
Introducing OpenAI and Large Language Models. The Transformer Model. What is Azure OpenAI?. Configuring Deployments. Understanding Tokens. LLM Pricing. Azure OpenAI Chat Completions API. Role Management: System, User and Assistant. Azure OpenAI SDK. Extending LLM capabilities with Function Callin.

DEPLOYING AI MODELS
Model Catalog Overview. Model Benchmarks. Selecting the Best Deployment Mode.

RETRIEVAL AUGMENTED GENERATION WITH AZURE AI SEARCH
What is Azure AI Search? Introduction to Embeddings and Vector Search. Retrieval Augmented Generation with Prompt flow and LangChain. Enhancing AI Models with your Own Data: Blog Storage, Azure SQL, OneLake... Hybrid Search with Semantic Reranking. Use AI Enrichment to extract insights. Fine-tuning vs RAG

DEVELOPING AI POWERED PYTHON APPLICATIONS WITH PROMPT FLOW AND LANGCHAIN
Introduction to Prompt Flow and LangChain. Developing Prompt-Based Workflows. Making your Python functions into LLM plugins. Creating Simple LLM Applications. Developing Chatbots. Building Vector Stores and Retrievers. Implementing Retrieval Augmented Generation (RAG) Applications. Streamlining AI Processes.

PROMPT ENGINEERING AND DESIGN PATTERNS
What is Prompt Engineering? Few-Shot Prompting. Structured Query Generation. Verifying Model responses with Hallucination Detection. Saving costs with Semantic Caching.

TESTING AND MODERATING AI MODELS
Ensuring Coherent and Relevant LLM Responses. Utilizing Correct Information in AI Answers. Preventing Inappropriate LLM Responses. Exploring Custom Evaluation Metrics in Azure AI Studio with Prompt flow. Leveraging Azure AI Content Safety Service. Enhancing AI Performance and Safety.

MAKING YOUR AI APPS TRACEABLE
Monitoring AI App Interactions in Production using the Prompt flow SDK. Integrating OpenTelemetry with Azure AI Studio. Tracing and Debugging with Prompt Flow SDK. Capturing Model Calls and Latency Issues. Setting Up Local Testing Environments.

FINE-TUNING AI MODELS WITH AZURE AI STUDIO
Introduction to Fine-Tuning LLMs. How to decide between Fine-Tuning and RAG? Using Task-Specific Data for Enhanced Performance. Reducing Hallucinations with Fine-Tuning.

9 - 12 December 2024
24 - 27 February 2025
22 - 25 April 2025

LEARNING GOALS
This course equips participants to develop, design and deploy AI solutions using Azure AI Studio. You'll learn to collaborate on projects, manage resources, and use advanced AI techniques like prompt engineering, retrieval augmented generation, and AI orchestration frameworks in Python like Prompt Flow and Langchain. The course also covers fine-tuning models for accuracy, ensuring responsible AI practices, and monitoring applications in production..

TARGET AUDIENCE
This course is designed for developers, data scientists, and AI Operators looking to leverage the full AI app development toolset provided by Azure AI Studio. Basic understanding of Python is recommended.

.NET

05 DAYS
UCSPR

18 - 22 November 2024
13 - 17 January 2025
24 - 28 February 2025
14 - 18 April 2025

LEARNING GOALS
This course teaches you how to start programming with Visual Studio, C# and .NET. You will get familiar with the C# language syntax and .NET Object-Oriented Programming concepts, such as classes, objects, inheritance, polymorphism...

TARGET AUDIENCE
This training targets developers with no or limited C# experience. A basic understanding of programming in whatever language is advised. Once you've finished this training, you can start your journey to learn building things like web applications, desktop or mobile apps, backends, games, IoT, bots, etc. All with C#.

OBJECT-ORIENTED PROGRAMMING IN C#

OVERVIEW OF .NET 9
What is a .NET Application? .NET Framework versus .NET. .NET Applications: ASP.NET Core, Web API, WPF, Blazor, .NET MAUI,...

THE .NET APPLICATION
The Visual Studio Solution and Project. Understanding Namespaces and Assemblies.

CLASSES AND OBJECTS
What is a class? Fields, Methods and Properties. Introduction to Debugging. Namespaces.

INSTANCE CONSTRUCTORS
Instance Constructors. Constructor Initializers. Overloading Constructors.

TYPES IN .NET
Type categories in .NET. Value types, Reference types and Immutable Reference types. Custom Value types: Structure and Enumeration. Boxing and Unboxing. Arguments of Functions. Pass by Value, by Reference. Passing Output.

STATIC MEMBERS AND STATIC CLASSES
Static Members. Static Constructors. Static Classes.

INHERITANCE
General Principle of Inheritance. Access Modifiers: Public, Private, Protected, File and Internal.

POLYMORPHISM
Inheritance & polymorphism. Overriding methods & properties. Using the base class. Sealed classes, methods and properties. The Object class. Overriding the ToString, Equals and GetHashCode method.

ABSTRACT CLASSES AND INTERFACES
Abstract classes. Defining interfaces. Implementing interfaces. Interface examples in .NET.

COLLECTIONS
Arrays in .NET, Multidimensional Arrays. Indexer properties. The for, foreach and while loops.

GENERICS
How to use Generics. Creating your own Generics. Generic constraints.

EXCEPTION HANDLING
The exception-mechanism in .NET. The try-catch-finally Keywords. Creating custom Exceptions.

USING DELEGATES AND EVENTS
Setting up a Timer using a delegate. Combining Delegates as a Multicast Delegate. Building a Programmable Robot using Delegates. Anonymous Methods and Lambda Expressions

EVENTS IN .NET
Creating Events. Using Events in a UI.

ASYNC AND AWAIT EXPLAINED
What is Asynchronous Programming? Comparing async/await to other Asynchronous Constructs. Diving into the Keywords. Async Guidelines.

LINQ QUERY SYNTAX
Anonymous Types. Using LINQ with IEnumerable. Func Delegates. Query Operations from, where, order, group and select. Using LINQ with IQueryable. Accessing a Database using Entity Framework Core.

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05 DAYS
UNOOP

9 - 13 December 2024
3 - 7 February 2025
7 - 11 April 2025

LEARNING GOALS
Today's applications must be more responsive, scalable and high-performing. Therefore, modern .NET developers need to be familiar with the more advanced features of .NET and understand how things work under the hood. This course delves into advanced concepts of the framework, such as async programming, parallel computing and Reactive Extensions.

TARGET AUDIENCE
Experienced developers who have a solid understanding of the .NET platform.

ADVANCED OBJECT-ORIENTED PROGRAMMING TECHNIQUES IN .NET

GENERICS
Generic Class Declarations and Generic Struct Declarations. Generic interface declarations. Understanding Covariance and Contravariance.

DELEGATES AND EVENTS
Creating Delegates. Using Delegates. Multicast Delegates. Creating Events. Using Events in a UI. Understanding Closures and static lambda functions.

LINQ FUNDAMENTALS
What is LINQ? LINQ to Objects, SQL, Entity Framework and XML. LINQ's Enumerable Class. Query Syntax vs. Method Syntax. Deferred Query Evaluation with Yield Return. LINQ Operators. LINQ Internals. Extending LINQ with your own Operators.

MODERN C# LANGUAGE FEATURES
Nullable Reference Types. Value Tuples and discards. Pattern Matching. Global and Implicit Usings. Required and Init-Only Properties. Records. File-Scoped Types and Namespaces. Using Raw String Literals. Required Members. Generic Attributes. Specifying the Return Type for Lambda Functions. Primary constructors. Collection expressions, inline arrays and the spread operator. Aliasing types.

GARBAGE COLLECTION
Allocating classes and structs - Heap vs. Call stack. The Lifecycle of a Class Instance. GC Class and Members. Forcing a Garbage Collection. Garbage Collection for Unmanaged Resources. The Dispose Pattern. Ressurection. Weak References.

REFERENCE SEMANTICS WITH VALUE TYPES
Understanding Reference Semantics. How Value Types allow you to write faster code. Passing value types by reference with new access modifiers. Understanding Span<T> and related classes. Measuring using BenchmarkDotNet.

CONCURRENCY
Understanding processes and threads. Different kinds of Concurrency. Scheduling Threads.

MULTITHREADING IN .NET
The Thread. Using the ThreadStatic attribute. Exceptions and threads. Understanding thread pooling. Debugging Multi-Threaded Code.

THREAD SYNCHRONIZATION
Race conditions and dead locks. Avoiding race conditions. Synchronizing threads: locks, monitors, signals... Thread safety in .NET.

TASKS
What are Tasks? Waiting asynchronously. Dealing with Exceptions. Task cancellation.

THE ASYNC AND AWAIT SYNTAX EXPLAINED
What is asynchronous programming? Comparing async/await to other Asynchronous Constructs. Diving into the Keywords. Async Guidelines.

ASYNCHRONOUS PROGRAMMING IN .NET
A History of Asynchronous Programming in .NET. Understanding SynchronizationContext. Cancellation, Progress and Exception Handling. ConfigureAwait. IAsyncEnumerable. Async Guidelines.

PARALLEL COMPUTING
What is parallel programming? Writing Parallel Loops . Concurrent collections. Parallel LINQ.

REACTIVE EXTENSIONS
Push vs. Pull. Understanding IObservable<T> and IObserver<T>. Hot and Cold Observables. IAsyncEnumerable versus Rx. What are Subjects? Using LINQ with Rx. Combining Observables. What about timing?

ATTRIBUTES AND REFLECTION
What are Attributes? Applying Attributes. Common Predefined Attributes. Building Custom Attributes. What is Reflection? Retrieving Attribute Values.

EXPRESSIONS AND STATIC REFLECTION
What are Expressions? How does LINQ to Database work? Using Static Reflection. Dynamically Generating Code with Expressions.

FULL STACK DEVELOPMENT WITH C# AND BLAZOR

INTRODUCTION TO BLAZOR
Blazor Components replacing MVC Controllers and Views. Converting a static web site with Blazor. Adding Streamed Rendering to improve user experience. Using Blazor to add interactivity to part of the web site. Introducing Web Assembly with .NET and Blazor. Introducing the different application models. Blazor Features Overview. Using Visual Studio Templates to Get Started.

BLAZOR COMPONENTS
What is a Blazor Component? Building a Simple Blazor Component. Component Parameters. Conditional Rendering and ChildContent. Separating the View and View-Model. Styling Components.

BLAZOR DATA BINDING
A Quick Look at Razor. One Way Data Binding. Event Handling and Data Binding. Two Way Data Binding. Reporting Changes with StateHasChanged. Component Data Binding. Understanding EventCallback.

BLAZOR FORMS AND VALIDATION
Working with Forms in Blazor. Adding validation to your forms. Disabling the «Submit» button when validation detects errors. Implementing custom validation in Blazor - Fluent Validation.

UNDERSTANDING BLAZOR COMPONENT LIFECYCLE HOOKS
Understanding Lifecycle Hooks. Implementing the right LifeCycle Hook(s). Limiting unnecessary Rerendering of components with. ShouldRender.

SERVICES AND DEPENDENCY INJECTION
Understanding Dependency Inversion & Injection. Some Inversion of Control Containers. Blazor and Dependency Injection. Building Blazor Services.

ADVANCED BLAZOR COMPONENTS
Referring to Components. Building Templated Components. Advanced Templated Components with Piggy-Wig. Optimized Rendering with Razor Templates. Rendering large amounts of rows using Virtualization. Help Blazor with change detection using @key.

BUILT-IN BLAZOR COMPONENTS
Using Existing Blazor Component Libraries. Using Dynamic Component. HeadContent and HeadOutlet. Feedback with Error Boundaries. Setting default focus with FocusOnNavigate. InputFile of uploading contents. Showing tables of data with QuickGrid.

REUSING COMPONENTS WITH COMPONENT LIBRARIES
Building a Component Library. Consuming a Component Library.

.NET 9 BLAZOR APPLICATION MODELS
The new Blazor Application Templates. Server-Side Rendering. Understanding Streamed Rendering. Adding Advanced Navigation and Forms Handling. Adding Interactive Components Using Three Rendering Modes. Building a desktop/mobile application with Blazor Hybrid.

REST COMMUNICATION
Sending and receiving data. Using the HttpClient Class and IHttpClientFactory interface. The HttpClientJSONExtensions Methods.

SINGLE PAGE APPLICATIONS AND ROUTING
What is a Single Page Application? Using Layout Components. Understanding Routing. Setting the Route Template. Redirecting to Other Pages. Sharing State between Components. Lazy Loading parts of your Blazor web site. Handling location changing events. Preventing Navigation to avoid losing changes.

JAVASCRIPT INTEROPERABILITY
Why do we still need JavaScript in Blazor? Calling JavaScript from C#. Calling .NET Methods from JavaScript. Displaying a map with a JavaScript library.

BLAZOR STATE MANAGEMENT
Examining Component State. Using Protected Browser Storage. The Redux Pattern. Using Redux Effects. Smart and Dumb Components.

UNIT TESTING BLAZOR APPLICATIONS USING BUNIT
Unit Testing Overview. Introducing BUnit. Understanding and Customizing Semantic Compare. Writing Unit Tests using C#. Using Razor Unit Tests.

UNDERSTANDING CLAIMS-BASED SECURITY
Representing the User. Introducing Claims Based Security. Understanding Tokens. Using Claims in .NET.

BLAZOR AUTHENTICATION WITH INDIVIDUAL ACCOUNTS
Auth using Individual Accounts. Extending Authentication with your own Data. Authorization using AuthorizeView.

BLAZOR AUTHENTICATION WITH OPENID CONNECT
What is OpenId Connect (OIDC)? Adding OIDC authentication to a Blazor Server application. Adding OIDC authentication to a Blazor WASM application.

LEARNING GOALS
'Full stack development' encompasses the practice of engaging with every layer of technology stacks in software development, typically involving both front-end and back-end tasks. Microsoft Blazor, a framework by Microsoft, facilitates the creation of modern applications across various platforms, including web, single page, mobile, and desktop. Blazor uniquely enables the use of C#, leveraging the skills and tools familiar to .NET developers. Consider attending this training to gain an early advantage in mastering Blazor.

TARGET AUDIENCE
This training requires basic knowledge about building websites with HTML and CSS, and also knowledge about C# and ASP.NET. All examples and labs are based on the latest Long-Term Support (LTS)

05 DAYS
UNASP

25 - 29 November 2024
20 - 24 January 2025
17 - 21 March 2025

LEARNING GOALS
This course will teach you how to build Web applications using the ASP.NET Core MVC (model-view-controller) framework and patterns in .NET 6, 7, 8 OR 9. This includes interacting with a database using Entity Framework Core; and creating and consuming RESTful services with ASP.NET Core Web API and JavaScript.

TARGET AUDIENCE
Students should have a good knowledge of C#.
Furthermore, a basic knowledge of HTML is advised.

BUILDING WEB APPLICATIONS WITH ASP.NET

INTRODUCTION TO THE WEB
HTTP Methods. Common HTTP Headers. Status Codes. RESTful Architecture.

ASP.NET ARCHITECTURE
ASP.NET Core Introduction. Server- versus Client-Centric Applications. ASP.NET Core Technology Overview. ASP.NET Core Request Processing Pipeline.

THE 3 MAIN ASP.NET MVC COMPONENTS
The MVC Pattern in ASP.NET Core. Handling user interaction with Controller. Rendering the response with MVC views. Creating a MVC Model and ViewModel. Understanding Routing.

END-POINT ROUTING
Getting Started with Routing Concepts. Defining Routing Templates. Route Parameter Contraints. Route Parameter Transformers. Understanding Route Matching. Using Concentional vs. Attribute Routing. Routing Attributes. Request Short Circuiting. Handling Routing Errors.

ASP.NET CORE MVC CONTROLLERS
Model Binding. Different Action Results. Model Binding. Action Filters. Redirections.

ASP.NET SERVICES AND DEPENDENCY INJECTION
Services. What is dependency injection? Methods of Dependency Injection. Dependency Inversion, Explicit Dependencies, and Inversion of Control. Using Services and Repository.

DESIGNING YOUR WEB APP'S MODEL
Passing Data to a View. ViewModels. Mapping between Model and ViewModel.

MODELING YOUR DATABASE WITH EF CORE
What is Entity Framework Core? The need for Object Relational Mapping. Methods of configuration. Creating and applying migrations. Table and column mapping. Modeling properties. Handling Concurrent updates. Modeling relationships.

RAZOR VIEWS
Building and Scaffolding Views. Understanding Layouts and Sections. Cleaner razor with Tag Helpers. Re-using Razor with Partial Views. Introducing Blazor Components. Adding Interactivity with Blazor Components.

DOM MANIPULATION WITH JAVASCRIPT
Introduction to JavaScript. Understanding the DOM. DOM Selection and Manipulation. Event Handling

RESPONSIVE WEB DESIGN WITH BOOTSTRAP
Normalizing and Resetting. The Grid System. Utility classes. Bootstrap Components. Customizing Bootstrap.

DATA VALIDATION
Explicit versus Implicit Validation. Validating data using Data Annotations. Self-Validating Models. Validating using the Model Binder. Client-side validation with Unobtrusive JavaScript.

STRUCTURING AN APPLICATION IN ASP.NET
Organizing Projects for Maintainability. Understanding Clean Architecture. Separation of Concerns in Project Layers.

AUTHENTICATION
Authentication and Authorization in ASP.NET Core. Username and Password Authentication. Extending Authentication with your own Data. Using the Microsoft Identity Platform. Authorization with Policies.

BUILDING RESTFUL SERVICES WITH WEB API
What is REST? Building a REST service with ASP.NET Core Web API. Supporting multiple representations: XML and JSON.

CONSUMING WEB APIS
Consuming a Web API from .NET. Best Practices for the .NET HttpClient using IHttpClientFactory. Using the Swagger CodeGen Client. Consuming a Web API from JavaScript with Fetch. Web APIs and JavaScript Frameworks.

DEPLOYING YOUR WEB APP
Deployment Fundamentals: Azure vs. On-Premises IIS. Windows Authentication. Configuring HTTPS in IIS. Deploying ASP.NET Apps on Azure. Setting Up On-Premises Hosting.

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05 DAYS
UWAPI

2 - 6 December 2024
3 - 7 February 2025
24 - 28 March 2025

LEARNING GOALS
ASP.NET Web API makes it easy to build REST APIs that reach a broad range of clients, including web and mobile applications. Along with best practices and modern design techniques, this extended 5-day training will guide you towards understanding API architecture, security considerations, and how to build a REST API with ASP.NET that is both extensible and flexible.

TARGET AUDIENCE
Participants of this course need to have a solid understanding of the .NET platform and building .NET applications using C#.

BUILDING ASP.NET WEB APIS

INTRODUCING TO THE WEB
Introducing the World Wide Web. HTTP Building Blocks. RESTful Architecture.

ASP.NET CORE ARCHITECTURE
What is ASP.NET Core? ASP.NET Core Request Processing Pipeline. Server- versus Client-Centric Applications. ASP.NET Core Technology Overview.

ASP.NET WEB API BUILDING BLOCKS
Getting Up and Running with Minimal APIs. Adding Structure to your Web API with Controllers. Web API Routing. Inspecting the Request Processing Pipeline.

ENDPOINT ROUTING
Getting Started with Routing Concepts. Defining Routing Templates. Route Parameter Contraints. Route Parameter Transformers. Understanding Route Matching. Using Attribute Routing. Routing Attributes. Understanding Routing Errors.

API CONTROLLERS
The Controller and ControllerBase Classes. The ApiController attribute. Action Methods and Action Results. Hooking into the Request Processing Pipeline with Filters.

DEPENDENCY INJECTION & TESTING
Methods of Dependency Injection. Dependency Inversion, Explicit Dependencies and Inversion of Control. Unit Testing your Components. Stubbing, Mocking & Faking.

MODELING THE DATA IN YOUR WEB API
Internal and External Models - How to organise resources. Mapping to Your Data Store with Entity Framework Core. Using Data Transfer Objects. Error Handling. HATEOAS.

CRUD
Model Binding. Binding Source Attributes. DTO Validation. Idempotency and Safeness. Potential Errors and How to Handle Them.

BEST PRACTICES WHEN DESIGNING A WEB API
Content Negotiation. Dealing with Batches. Cross Origin Resource Sharing (CORS). Limiting Data. Service Oriented Architecture.

API PERFORMANCE
Making your Backend Asynchronous. Dealing with Cancellation. Throttling requests. Taking Advantage of Server-side and Client-side caching. Dealing with Large Resources.

MANAGING YOUR WEB API
Versioning: How to Add New Features to your API Without Breaking Existing Clients. Limiting Access to your API with API Keys. Leveraging Azure API Management as a Platform to Oversee All of Your APIs.

DOCUMENTING YOUR REST SERVICE WITH THE OPENAPI SPECIFICATION
Swagger and Swashbuckle. Enriching your Metadata with Attributes. Enriching your Metadata with Comments. Adding XML-Comments. Generating Client-side Code with Visual Studio and Swagger Codegen.

SECURING YOUR WEB API
Authentication & Authorization in Web API. Authorization Attributes and Policies. Authentication with OAuth and OpenID Connect. Working with Roles and Scopes.

ACTIONS AND REMOTE PROCEDURE CALLS
Actions VS Resources: A Practical Comparison. Exposing Actions in Web API. Introducing gRPC. Creating and Consuming gRPC Services.

ASYNC PATTERNS IN WEB API
Async Request-Reply Pattern: decoupling Request and Response. Webhooks: Events for the Web.

CONSUMING WEB APIS
Consuming a Web API from .NET. Best Practices for the .NE

ADVANCED .NET 9 WEB DEVELOPMENT

.NET 9 INTRODUCTION
Understanding .NET 9. Supporting multiple runtimes. What is .NET Standard?

VISUAL STUDIO FOR ASP.NET CORE
Visual Studio 2022. Developing with the new Hot Reload. NuGet. Creating your own NuGet packages. Dotnet CLI. Global.json.

ASP.NET CORE PIPELINE
Understanding the principle of the ASP.NET Core Pipeline. Configuring the pipeline in the Program class. Understanding Dependency Injection. Diagnostic Middleware. Using HTTPS and the HSTS header. Serving Static Files. Configuring Routing Understanding Sessions and Caching. Exploring other built-in middleware.

BUILDING CUSTOM MIDDLEWARE FOR ASP.NET CORE
Building your own custom middleware. Testing your middleware.

ASP.NET CORE CONFIGURATION
Different ways of getting configuration to your code. Storing sensitive configuration in Secrets. Using Azure App Configuration. Adding your own configuration provider.

LOGGING
Why do we need another logging framework? Choosing from different logging providers. Understanding logging scopes. Using the HTTP Logging Middleware. An example: Using NLog with .NET Core.

FILTERS
How Filters Work. Authorization Filters. Action Filters. Result Filters Exception Filters. Service and Type Filters. Filters versus Middleware

ADVANCED RAZOR TECHNIQUES
Using CSS Isolation for Razor Views. Cleaner Razor with TagHelpers. Building Custom TagHelpers. Understanding and Creating View Components. Display and Editor Templates. Service Injection.

INTEGRATION WITH A JAVASCRIPT FRONTEND
Setting up a JavaScript Frontend with a .NET Backend. Visual Studio Templates. Using a Proxy and CORS. VS Templates for Angular and React.

MINIMAL APIS
Benefits of Minimal APIs. Routes and Handlers. Model Binding and Return Types. Code Organization. Endpoint Filters. Route Groups.

SIGNALR
Server Concepts. Building SignalR Clients with C# and JavaScript.

BUILDING SPA WITH C# AND BLAZOR
Introducing Blazor and Web Assembly. Client-Side vs. Server-Side Blazor. Creating a simple Blazor Component. Hosting Blazor.

EFFICIENT COMMUNICATION WITH GRPC
What is gRPC? Defining your contracts. Implementing your contracts on the server. Generating a Proxy and using it on the client.

INTERNATIONALIZATION
Display Content in Different Cultures. Using resource files. Autodetect Cultures.

UNDERSTANDING CLAIMS-BASED SECURITY
Representing the user. Introducing claims based security. Understanding tokens and their representation on the net. Using Claims in .NET.

MODERN WEB AUTHENTICATION AND AUTHORIZATION
The Internet and a way of sharing. Introducing OAuth and OpenID Connect. OAuth fundamentals: Authorization Code Grant, Implicit Grant and Client Credential Grant. Implementing OpenID Connect web signin with Entra ID and Identity Server.

PROTECTING A WEB-API WITH OPENID CONNECT
Protecting a Web API's resources. Adding permissions to the server side. Requesting permissions at the client side. Using the Microsoft Authentication Library (MSAL). User consent.

PUBLISHING YOUR APPLICATION
Deployment Options. Cross-platform Deployment. Self-Contained Deployment. Optimize your deployment with Assembly Trimming. Ahead of Time (AOT) compilation. Deploying to Containers.

AZURE APP SERVICES: WEB APPS
Understanding Azure Web Apps. Deploying from Visual Studio. Configuring app settings, TLS, domain names and backup scheduling. Monitoring your Web API.

4 - 8 November 2024
13 - 17 January 2025
17 - 21 March 2025

LEARNING GOALS
So you've been using ASP.NET for a while, and you want to learn more? Join us in this training to upgrade your skills to master .NET 9, and ASP.NET Core. In this advanced ASP.NET development course you will build up the necessary knowledge and tools for dealing with the complexity of modern web applications using .NET, Entity Framework Core, apply Clean Architecture, and get more insights into SignalR, gRPC, Blazor, Azure, OpenID Connect and Internationalization.

TARGET AUDIENCE
This course is meant for developers who have experience with ASP.NET Core MVC and/or Web API and want to become a master in ASP.NET Core.

WEB SECURITY DEVELOPMENT TECHNIQUES

SECURITY: A MANY PRONGED WORD
Non-disclosure. Authentication. Authorization. Data-tampering. Security testing. Applying STRIDE. The Ten Immutable Laws of Security.

PRIVACY
Encryption. Understanding Symmetric Keys. Asymmetric Keys. Hybrid Encryption. Hashing. Properly store passwords with Hashing and Salt. What are Digital Signatures? Certificates, SSL, TLS and HTTPS.

OWASP WEB SECURITY HEADERS
Understanding HTTP headers. Setting headers in IIS and ASP.NET Core. HTTP Strict Transport Security header. HSTS options.

UNDERSTANDING CLAIMS-BASED SECURITY
Representing the User. Introducing Claims Based Security. Understanding Tokens. Using Claims in .NET

MODERN WEB AUTHENTICATION AND AUTHORIZATION
The Internet and a Way of Sharing. Introducing OAuth and OpenID Connect. OAuth Fundamentals: Authorization Code Grant, PKCE and Client Credential Grant. Implementing OpenID Connect Web Sign-in with Entra ID.

PROTECTING A WEB-API WITH OPENID CONNECT & AZUREAD
Protecting a Web API's resources. Adding permissions to the server side. Requesting permissions at the client side. Using the Microsoft Authentication Library (MSAL). User consent.

WEB SITE SECURITY THREATS AND DEFENCES
OWASP - Top 10 security issues. Broken Access Control. Cryptographic Failures. Injection. Insecure Design. Security Misconfiguration. Vulnerable and Outdated Components. Indentification and Authentication Failures. Software and Data Integrity Failures. Security Logging and Monitoring Failures. Server-Side Request Forgery. Extra: Denial of Service.

FINDING VULNERABILITIES
Introducing the OWASP Juice Shop. Finding vulnerabilities in a webshop.

7 - 9 October 2024
27 - 29 January 2025
24 - 26 March 2025

LEARNING GOALS
This course takes you through the different security threats and defences and teaches you hands-on how to apply them to ASP.NET Core. This course provides in-depth, hands-on experience securing your web-based applications.

TARGET AUDIENCE
This course is meant for developers who have experience with ASP.NET and want to make the world a safer place through applied security best practices.

05 DAYS
UARCH

14 - 18 October 2024
25 - 29 November 2024
17 - 21 February 2025
14 - 18 April 2025

LEARNING GOALS
So, how can you become a better developer? One of the best ways is to learn about design patterns. Design Patterns provide reusable solutions for common software design challenges. In this training, we identify software design problems and explore how to address them using the most suitable Design Pattern.

TARGET AUDIENCE
This course is intended for experienced programmers who are very familiar with C# and have a working experience with .NET.

.NET BEST PRACTICES: ARCHITECTURE & DESIGN PATTERNS

SOLID PRINCIPLES
Single Responsibility. Open/Closed. Liskov Substitution. Interface Segregation. Dependency Inversion.

INTRODUCTION TO PATTERNS
What is a Pattern? The Gang of Four: Erich Gamma, Ralph Johnson, Richard Helm and John Vlissides. Different kinds of design patterns: creational, structural and behavioral patterns. The difference between implementation, design and architecture patterns... Some anti-patterns such as Loosy-Goosy.

CREATIONAL PATTERNS
What is a Singleton? Singleton implementation choices in .NET. Factory Method - delegating/hiding the creation of objects to a factory. Abstract Factory - abstracting to a factory to create families of objects.

BEHAVIORAL PATTERNS
Template Method. Strategy. Chain of Responsibility. State. Iterator. Observer. Mediator.

BUILDING YOUR OWN LITTLE PROGRAMMING LANGUAGE WITH SOME PATTERNS - FUN!
Interpreter: Build your own expressive language-grammar and execute it. How LINQ uses Interpreter - and how you can take advantage of it yourself. Builder: Hide how complex hierarchies of objects get built - and allow variations. XAML as the ultimate builder. Reflection: the ideal .NET way for implementing your own builder. Visitor: When you need a lot of different operations on the same object structure.

STRUCTURAL PATTERNS
Adapter. Decorator. Composite. Facade. Flyweight. Proxy.

AUTOMATING YOUR CODE WITH SOURCE GENERATORS
What are Source Generators? .NET 7 and 8 Source Generators. Implementing an incremental Source Generator. Source Generator Best Practices.

MODEL-VIEW-WHATEVER
Model-View-Controller: An ancient pattern back in fashion. ASP. NET MVC - an introduction. MVVM in WPF/.NET MAUI - MVW taking advantage of powerful databinding capabilities. Command: Encapsulate behavior in objects. Implementing commands using closures.

REACTIVE PROGRAMMING
What are Observables? Using Reactive Extensions. Applying the Redux pattern to simplify complex applications.

DESIGN PATTERNS APPLIED: DEVELOPING YOUR OWN REUSABLE LIBRARY
Adding the GoF Command pattern to MVVM. Using interfaces for flexibility. Building Command Objects - extending WPF's ICommand interface. Adding Undo and Redo functionality to the command pattern. Using a CommandManager class. Challenge: retro-fitting our commands into MVVM without lots of changes. Implementing Undo-Redo using the Memento pattern. Choosing whether or not to add the Prototype pattern. Ideas on how to proceed with the command pattern.

03 DAYS
UDEF

16 - 18 December 2024
10 - 12 February 2025
28 - 30 April 2025

LEARNING GOALS
In the realm of business applications, the necessity for a data access layer to interface with databases is common. Enter Entity Framework Core (EF Core), a tool that seamlessly integrates with DDD principles. This course delves into the fundamentals of Domain-Driven Design and illustrates how EF Core can be instrumental in applying these principles effectively.

TARGET AUDIENCE
Attendees are required to have prior knowledge of C# and .NET.

DOMAIN DRIVEN DESIGN WITH ENTITY FRAMEWORK CORE

INTRODUCTION TO DOMAIN DRIVEN DESIGN
What is DDD? Advantages of using DDD. When is DDD a bad option?

ARCHITECTING MODERN WEB APPLICATIONS
'Clean' Architecture: put the business and application model at the center. Understanding the Core, Infrastructure and Presentation layer. Testing everything with Clean Architecture.

UNIT TESTING IN .NET AND .NET 9
What every developer wants: Quality code that works; and keeps on working. Finding bugs: not just in code. Or how NASA lost a 125.000.000$ Mars orbiter. What is unit testing? And what is a good unit test? Understanding the difference between a unit test and an integration test. Test Driven Development Should you be doing it? Roleplaying: Marge, Homer and Bart. The Triple-A of unit testing and what has cooking to do with this?

UNIT TESTING WITH VISUAL STUDIO WITH XUNIT
Unit Testing best practices with XUnit. Facts and Theories. Using the Test Explorer Window. Live unit testing with Visual Studio Running tests in parallel, or not. Measuring and improving Code Coverage. Replacing dependencies using Fakes, Stubs and Mocks. Building Stubs and Mocks using NSubstitute.

TACTICAL DESIGN
What is tactical design? Entities, Services, Aggregates, etc... Applying Tactical Design to a real world business case.

TACTICAL DESIGN - ENTITIES AND VALUE OBJECTS
Differentiating between Entities and Value Objects. Designing Entities their Identity. Designing immutable Value Objects. Implementing Value Objects Equality efficiently. C# 9 records.

TACTICAL DESIGN - DOMAIN SERVICES AND MODULES
Providing domain specific operations with Domain Services. Domain, Infrastructure and Application Services. Segregating concepts using Modules.

STRATEGIC DESIGN
Anti-Pattern: Big Ball of Mud. The linguistic delimitation that are Bounded Contexts. Identifying the terms and concepts with the Ubiquitous Language. Relating Bounded Contexts with Context Maps.

TACTICAL DESIGN - LIFE CYCLE, AGGREGATES, FACTORIES AND REPOSITORIES
Clustering Entities and Value Objects with Aggregates. Anti-Pattern: Death by a Thousand Dots. Abstracting the creation of business objects with Factories. Data storage by using Repositories. Abstracting queries using Specifications.

MODELING YOUR DATABASE WITH EF CORE
Methods of configuration. Creating and applying migrations. Table and column mapping. Modeling properties. Mapping Value generated properties. Handling Concurrent updates. Modeling relationships. Mapping inheritance.

ADVANCED EF: MAPPING DDD TO EF CORE
DDD and Persistance Ignorance. Implementing Value Objects with Owned Properties. Using Shadow Properties to Avoid 'Leaky Abstractions'. Building Repository and Specification classes. Testing your Specifications. Entity Validation.

TACTICAL DESIGN - DOMAIN EVENTS
What are Domain Events? Publishing significant domain changes with Domain Events. Using MediatR with Domain Events.

UNIT TESTING ASP.NET CORE WEB APPLICATIONS
Challenges when unit testing MVC applications. Writing unit tests for your MVC controllers. Unit testing ApiControllers. Testing data access, such as Repositories and Specifications. Using the ASP.NET Core testing framework. End-to-end testing.

VERSION CONTROL AND TEAM COLLABORATION WITH GIT

In this training, you will learn about practical use of Git, including managing repositories in your day-to-day work, making commits, performing pulls and pushes, and checking history. More advanced topics are also covered, such as branching, merging, and ending with using rebase and pull requests.
For more information, visit www.u2u.be/cc/ugit.

EFFECTIVE UNIT TESTING

UNIT TESTING IN .NET
What every developer wants: Quality code that works; and keeps on working. Finding bugs: not just in code. - Or how NASA lost a 125.000.000$ Mars orbiter. What is unit testing? And what is a good unit test? Understanding the difference between a unit test and an integration test. Test Driven Development - Should you be doing it? Role-playing: Marge, Homer and Bart. The Triple-A of unit testing - and what has cooking to do with this? Given-When-Then.

UNIT TESTING WITH VISUAL STUDIO WITH MSTEST AND XUNIT
MSUnit - Built-in into Visual Studio. Building and running Unit Tests with MSUnit. Using the Test Explorer Window. Using Test Settings. Live unit testing with Visual Studio. Unit Testing best practices with XUnit. Facts and Theories. Unit testing parallelism. Fluent Assertions. Measuring and improving Code Coverage.

MORE LOOSE COUPLING USING DEPENDENCY INJECTION
What is tight coupling and how to prevent it? Using Inversion of Control (IoC) containers. Constructor and Property injection. Microsoft.Extensions.DependencyInjection as an example.

WRITING TESTABLE CODE
Testing dependencies - and the art of writing testable code. The difference between a Fake, a Stub and a Mock. How to replace dependencies with stub and mock objects. The Extract and Override pattern. How the MVVM pattern facilitates UI testing. Replacing configuration in tests.

ISOLATION FRAMEWORKS: NSUBSITUTE AND MICROSOFT FAKES
Understanding Isolation Frameworks. Building Stubs and Mocks with NSubsitute. Checking arguments and return values. Using Linq to Mocks. What makes Microsoft Fakes so special. Faking time with TimeProvider and ITimer. Testing legacy/untestable code. Building Stubs and Mocks with Fakes.

UNIT TESTING ASP.NET APPLICATIONS
Challenges when unit testing ASP.NET applications. Writing unit test for your MVC controllers. Unit testing your views. Unit testing ApiControllers. Faking Data Access. Using the ASP.NET Core testing framework. End-to-end testing with Microsoft Playwright.

AUTOMATIC REGRESSION TESTING
What is a regression? Using an automated build system. Continuous integration. Running integration tests. Automatic regression tests. Automatically running your regression tests using GitHub Actions.

BUILDING MOBILE APPS WITH .NET MAUI

INTRODUCTION TO MAUI
Mobile Development Options and Problems. A Uniform Way for Creating UIs. Creating a .NET MAUI Project.

BUILDING THE UI WITH XAML
What is XAML? XAML versus Code. Looking at XAML Basic Syntax. Understanding XAML Attached Properties. Nesting Controls. Extending XAML through Markup Extensions. Understanding Namespace Mapping. Naming Elements.

.NET MAUI CONTROLS OVERVIEW
Examining the Class Hierarchy. The Power of Composability. Presentation Controls, Command Controls, Editing Controls. Collection Controls. the Trouble with Images.Understanding Bindable Properties.

CONTROLLING THE LAYOUT
Absolute positioning using AbsoluteLayout. Flexible positioning using FlexLayout. Tabular positioning with Grid. Stacking controls with StackLayouts. Frames, Scrollview and Contentviews.

REUSABILITY WITH RESOURCES
Reusing Objects through Resources. Resource Inheritance. Resource Dictionaries. Theming your Application. Multilingual Applications.

STYLES AND TEMPLATES
Why we need Styles. Default, Implicit and Explicit Styles. Dynamic and Device styles. Styling using CSS. Theming an application. Introduction to Control Templates. Control Handlers. Effects.

DATA BINDING
The Need for Data Binding. Binding to Properties. Converting Data for Data Binding. Binding to Collections. Understanding Source and BindingContext. Cell Templates. Data Templates. Filtering, Sorting and Grouping. Compiled Bindings. Using BindableLayout.

BUILDING ADAPTIVE AND SCALABLE LAYOUTS
Fixed Versus Adaptive Layout. Working with the ViewStateManager and Adaptive Triggers.

NAVIGATION
Navigation in .NET MAUI. NavigationPage, TabbedPage, FlyoutPage and Modal Pages. Shell Applications. Route-based Navigation in Shell.

DEALING WITH DIFFERENT PLATFORMS
Shared Projects. Dependency Injection. Multi-Targetting Code. Using Platform Specific Controls. The MessagingCenter.

.NET MAUI ESSENTIALS
Clipboard, Compass, Contacts, Device Info, Email. File Picker, Geolocation. Phone Dialer, Preferences, Secure Storage, Web Authenticator.

PROCESS LIFECYCLE MANAGEMENT
When Apps Run. Handling Resume, Suspend and Termination. Supporting Different App Activation Scenarios. Splash Screens.

STORING DATA
Local Storage. Working with SQLite. Using Entity Framework Core.

CONSUMING WEB SERVICES
HttpClient and WebHttpRequest Class. Serialization and Deserialization.

DATA VALIDATION
INotifyDataErrorInfo. Data Annotations. Validation through Events. Validation Templates.

MVVM
What is the MVVM Pattern? Using Commands instead of Event Handling. Defining the Model. Adding the ViewModel. Binding the View to the ViewModel. Using Behaviors.

NOTIFICATIONS
Platform-specific Notification Mechanisms. Local Notifications. Push Notifications.

05 DAYS
UAWEB

14 - 18 October 2024
2 - 6 December 2024
3 - 7 February 2025
31 March - 4 April 2025

LEARNING GOALS
This training is designed to get developers up to speed with designing, developing, hosting and managing web applications using Microsoft Azure. Azure Web Apps and Azure Functions will contain your code; Azure SQL, Cosmos DB and Blob Storage will hold your data; and Message Brokers and Logic Apps will wire it all together. You will also learn about security, monitoring and automated deployment.

TARGET AUDIENCE
This course is intended for web developers who would like to get familiar with the web development services and tools of Microsoft Azure, focusing on the PaaS (Platform as a Service) offerings from Microsoft Azure. A basic understanding of ASP.NET is expected.

DEVELOPING & DEPLOYING WEB APPS ON MICROSOFT AZURE

MICROSOFT AZURE OVERVIEW FOR DEVELOPERS
Overview of Microsoft Azure. Usage Scenarios. Software as a Service (SaaS). Platform as a Service (PaaS). Infrastructure as a Service (IaaS). Pricing. The Azure Management Portals. The Azure Management Portals. Azure Components.

APP SERVICE PLANS
What is an App Service. Purpose of Service Plans. Creating a Service Plan. Scaling a Service Plan. Moving and Cloning Apps to other Service Plans.

DEPLOYING RESOURCES WITH ARM AND BICEP
The Azure Resource Manager. Declarative Syntax for ARM Templates. Getting ARM templates for your Deployed Resources. Bicep. Deploying with Templates.

APP SERVICES: WEB APPS
Deploying from Visual Studio. Configuring App Settings, TLS, Domain Names and Backup Scheduling. Monitoring your Web App. Running and Testing Locally. Spinning up Multiple Website Instances. Working with Deployment Slots. API Metadata and CORS. API Management.

STORING YOUR DATA IN THE CLOUD
Advantages of Storing Data in the Cloud. Microsoft Azure Storage Concepts. Storage APIs: Blob, File, Table and Queue. Securing your Storage with Shared Access Signatures. Using the Azure CDN to Serve your Assets.

BROKERED MESSAGING IN THE CLOUD
Using Service Bus Queues for Decoupling Applications. Dispatching Messages with Topics and Subscriptions. Adding Filters to Subscriptions.

SERVERLESS COMPUTING WITH AZURE FUNCTIONS
Serverless Azure Functions. Development Environments. Triggers and Bindings. Hosting and ScalingCreating Workflows with Durable Functions.

SERVERLESS COMPUTING WITH LOGIC APPS
Workflow-like logic. Triggering a Logic App. Connectors and Actions. Controlling the flow: Conditions, Variables and Iterations.

AZURE SQL DATABASE
Features and Service Tiers. Azure SQL Server and Azure SQL Database. Comparison with on-prem SQL. Backups and Replication. Authentication and Firewall.

SECURING YOUR APPLICATIONS AND APIS WITH MICROSOFT IDENTITY PLATFORM
Microsoft Entra ID. Basic Principles: Users, Groups, App Registrations, Roles and Scopes. Tokens and Claims. Authentication Scenarios. Microsoft Authentication Library.

ELIMINATE CREDENTIALS USING MANAGED IDENTITY
System-Assigned and User-Assigned Managed Identities. Accessing Blob Storage, Azure SQL and Service Bus. Storing secrets using Azure Key Vault.

LOGGING AND MONITORING YOUR APPLICATIONS
Enabling Application Insights. Diagnosing Failures. Diagnosing Dependencies. Custom events and using Metrics Explorer. Availability and Performance. Using Alerts to Detect Live Problems Early. Snapshot Debugging.

REDIS CACHE
What is Redis Cache. Data Types you can use in your Cache. Accessing the Cache. Redis Messaging. Implementing Redis Cache into your Website.

STORING YOUR DATA IN COSMOSDB
What is Cosmos DB. Scaling and Partitioning. Using Document Databases using the NoSQL API. Using Document Databases using the MongoDB API. Using Graph Databases using the Gremlin API. Using Key-Value Databases using the Table API.

CI/CD WITH AZURE DEVOPS
DevOps Lifecycle. Planning. Build. Release Management.

AZURE STATIC WEB APPS
Static Web Apps. API support with Azure Functions. Integrate with a GitHub Repository. Automated and Distributed Deployment.

03 DAYS
UASPI

9 - 11 December 2024
3 - 5 February 2025
31 March - 2 April 2025

LEARNING GOALS
This course is designed for developers looking to master the art of building robust, high-performance distributed systems. Use .NET Aspire to design, implement, and manage applications that are resilient, scalable, and ready to meet the demands of modern business environments.

TARGET AUDIENCE
This course is intended for experienced .NET developers who would like to get acquainted with Distributed Applications, Containers and Microservices on Azure.

DEVELOPING DISTRIBUTED APPLICATIONS WITH AZURE AND .NET ASPIRE

INTRODUCTION TO DISTRIBUTED APPLICATIONS
Application Architecture Throughout the Years. Containers: The Gateway to Distributed Applications. Docker Basics. Strengths and Challenges in Modern Appliation architecture. .NET Aspire to the Rescue

.NET ASPIRE OVERVIEW
The Pillars of .NET Aspire. Orchestration in C# with AppHost. Aspire Dashboard: Get the Best Developer Experience you can, for Free! Observability, Resiliency and Health Checks using Service Defaults. .NET Aspire Deployment Options.

BUILDING DISTRIBUTED APPLICATIONS WITH .NET ASPIRE
Basic Building Blocks of a Distributed Application. Tying the Building Blocks of your Application together. Connecting Your Projects to eachother with Service Discovery. Should your Development Environment really try to mimic your Production Environment?

ENHANCING YOUR APPLICATION WITH PLUGGABLE COMPONENTS
What are .NET Aspire Components? Commonly Used Components: Caching, Messaging, Storage,... Hosting and Consuming Components. Configuring Components.

BUILDING A MICROSERVICE ARCHITECTURE
Dealing with Evolution in an Application. Benefits and Drawbacks Scaling. Communication: Client-Service, Service-Service, Event-Based. Data Isolation per Microservice. Integrating Containers and Microservices into a .NET Aspire Application.

ASYNCHRONOUS COMMUNICATION
Communication Patterns. Event-Based Communication. Event Bus. Integration Events. Eventual Consistency. Azure Service Bus

SYNCHRONOUS COMMUNICATION
Problems with Direct Communication. Retry. Circuit Breaker. Sidecar Pattern. Service Mesh.

BUILDING MICROSERVICES WITH DAPR
Dapr Overview. Installation. State Management. Service Invocation. Publish and Subscribe. Bindings. Observability. Secrets Management.

AZURE CONTAINER APPS
Container Apps and Environments. Event-based Scaling with KEDA. Working with Revisions. Integrating with Dapr Components. Network and Ingress. Authentication and Service Connection.

DEPLOYING .NET ASPIRE APPLICATIONS
Aspire Manifest. Deploying to Azure Container Apps. Deploying to AKS using Aspir8. Continuous Integration & Deployment

MICROSOFT AZURE ARCHITECTURE MASTER CLASS - DEVELOPMENT

04 DAYS
UACA

AZURE ARCHITECTURE INTRODUCTION
Azure Global Infrastructure. Architectural Building Blocks: Applications, Data, Communication and Others. Considerations: Availability, Resiliency, Performance, Cost...

MICROSERVICES
Dealing with Evolution in an Application. Benefits and Drawbacks. Communication: client-service, service-service. Data Isolation.

SCALING AN APPLICATION IN AZURE
Using an App Service Plan. Using an Orchestrator. Serverless. MultiRegion. Load Balancing. Azure Resources: Traffic Manager, Front Door, Load Balancer, Application Gateway.

SQL VERSUS NOSQL
Schemas and Relations. Data Consistency. Read and Write Performance. Partitioning and Scaling. Azure Resources: Azure SQL, Cosmos DB.

SCALING A DATABASE IN AZURE
Vertical versus Horizontal Scaling. Partitioning and Sharding. MultiRegion. Azure Resources: Azure SQL, Cosmos DB.

CACHING STRATEGIES
Azure Redis Cache. Cache-Aside Pattern. Read-Through and WriteThrough. Materialized View Pattern. Valet Key Pattern. Azure CDN.

SYNCHRONOUS COMMUNICATION
Retry and Circuit Breaker Throttling. Bulkhead Pattern. Ambassador Pattern.

ASYNCHRONOUS COMMUNICATION
Messages, Events and Commands. Queue-Based Load Leveling. Event-Based Communication. Asynchronous Request-Reply.

DESIGNING A MESSAGE BROKER IN AZURE
Partitioning. Push vs Pull. Pub-Sub. Mechanisms. Claim-Check Pattern. Azure Resources: Service Buss Event Grid, Storage Queues.

DATA CONSISTENCY
Strong Consistency. CAP Theorem. Eventual Consistency. Outbox Pattern. Compensating Transaction Pattern.

CQRS AND EVENT SOURCING
The Problem with CRUD. Read and Write Models. Commands. Event Store.

EXTERNAL COMMUNICATION
API Gateway. Backend for Frontends. Asynchronous Request-Reply. Webhooks. Azure Resources: API Management, Front Door, Logic Apps.

SECURITY CONCERNS
Options for Storing Sensitive Data. Azure Key Vault and Managed Identity. Service Authentication. Security on Infrastructural Level: Virtual Networks, Firewalls,... Gatekeeper Pattern.

18 - 21 November 2024
27 - 30 January 2025
24 - 27 March 2025

LEARNING GOALS
In this training, we begin by examining potential problems that a cloud developer/architect may encounter. Then, we explore solutions using proven patterns. Finally, we delve into various technologies available in Azure to implement these patterns. The focus of this training is on concepts and patterns that apply to any cloud environment.

TARGET AUDIENCE
People who want to become cloud architects in Microsoft Azure. Participants in this course should have a strong developer background and a foundational understanding of Azure or similar cloud platforms.

MICROSOFT AZURE FUNDAMENTALS

01 DAY
AZ-900

This course will provide foundational level knowledge on cloud concepts; core Azure services; and Azure management and governance features and tools. This course is suitable for IT personnel who are just beginning to work with Azure. For more information, visit www.u2u.be/cc/az-900.

05 DAYS
UAZUREA

18 - 22 November 2024
27 - 31 January 2025
17 - 21 March 2025

LEARNING GOALS
The Microsoft Azure Cloud platform offers a wide variety of services to host your infrastructure components: Virtual machines, virtual networks, SQL Azure databases, web apps, ... This course will provide you with the knowledge and skills to setup your cloud infrastructure in Azure.

TARGET AUDIENCE
This course is intended for IT professionals responsible for implementing and maintaining the IT environment.

MICROSOFT AZURE INFRASTRUCTURE SERVICES

AZURE OVERVIEW
Cloud Computing. Azure Benefits. Software as a Service (SaaS). Platform as a Service (PaaS). Infrastructure as a Service (IaaS). Global Azure Infrastructure. Azure Products Overview. SLA and Pricing. Azure Resource Manager.

AZURE MANAGEMENT TOOLS
Azure Portal. Managing Azure with PowerShell. Managing Azure with the CLI. Azure Cloud Shell. Azure Resource Manager Templates. Bicep.

AZURE AUTHORING SOLUTIONS
Azure Resource Manager (ARM) Templates. Terraform. Bicep.

MANAGING SUBSCRIPTIONS
Management Groups. Naming and Tagging. Resource Locks. Role Based Access Control (RBAC).

AZURE STORAGE
Azure Storage Types: Blob, Tables, Queues, Files and Disks. Storage Accounts. Secure Access to Storage. Working with Storage. Azure File Sync.

AZURE NETWORKING
Virtual Network. Virtual Network Design. VNet Peering. Site-to-Site Connection. Point-to-Site Connection. ExpressRoute.

AZURE VIRTUAL MACHINES
Virtual Machines Overview, Pricing and Storage. VM Networking. Network Security Groups. Creating VMs. Connect to a VM: RDP, SSH, Bastion.

AZURE ADVANCED NETWORKING
Azure DNS. User Defined Networking. Service Endpoints. Private Endpoints. Azure Firewall.

AZURE HYBRID NETWORKING
Virtual Network Gateway. Site-to-Site Connections. Point-to-Site Connections. ExpressRoute. Azure Virtual WAN. Azure Virtual Network Hub.

AZURE LOAD BALANCING
Azure Load Balancer. Application Gateway. Web Application Firewall. Traffic Manager. Azure Front Door. Comparing Load Balancing Solutions.

MANAGE AZURE VMS
Disk Management. VM Extensions. VM Backup. Recovery Services. Update Management.

SIZING AND TROUBLESHOOTING AZURE VMS
Boot Diagnostics. Serial Console. RDP Connection Issues. Run Command. Azure Mobile App. VM Scale Sets.

AZURE WEB APPS
App Services and App Service Plans. Web Apps. Deployment. Deployment Slots. Web App Scaling. Backup and Restore. Adding a Custom Domain to your Web App. Enabling HTTPS.

AZURE SQL DATABASE
Azure SQL Database Service. Managed Instances. Pricing Models. Creating and Managing Databases. Connecting to SQL Azure Database. Business Continuity. Security.

AZURE GOVERNANCE
Azure Policy Overview. Create Custom Azure Policies. Cost Management.

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04 DAYS
UAIA

28 - 31 October 2024
20 - 23 January 2025
22 - 25 April 2025

LEARNING GOALS
Making design and architectural decisions is not always an easy task. So the key is to find the best option for the job in terms of cost, manageability, high availability, security, ... In this course we will investigate various Azure services, compare them and debate about the best service for a given project. This course focuses on architecture and design, not on the technical implementation of Azure resources.

TARGET AUDIENCE
Participants should have experience in Azure and understand the services and solutions offered by the platform.

MICROSOFT AZURE ARCHITECTURE MASTER CLASS - INFRASTRUCTURE

AZURE INFRASTRUCTURE ARCHITECTURE INTRODUCTION
Global Azure Infrastructure. Architectural Building Blocks: Storage, Networking, Compute. Design Influencers: Security, Cost, Performance, High Availability, ...

DESIGNING SUBSCRIPTIONS
Tenants. Management Groups. Subscriptions. Resource Groups. Azure Regions. Naming and Tagging.

RESOURCE DEPLOYMENT
Scripting versus Declarative Approach. Declarative Languages: ARM Templates, Terraform, Bicep. Azure BluePrints. Azure DevOps versus GitHub. Automation Design Considerations.

NETWORK DESIGN
IP Address Ranges. Hub and Spoke Topology. Azure Virtual WAN. Network Routing: UDR versus BGP. Hybrid Networking: VPN Gateways versus ExpressRoute. Network Topology Design Options.

NAME RESOLUTION
Azure-Provided Name Resolution. Azure Private DNS Zone. Hybrid Name Resolution: Azure DNS Private Resolver. Name Resolution with Azure Virtual WAN.

VNET INTEGRATION OPTIONS FOR PAAS SOLUTIONS
Service Endpoints. Private Endpoints. VNet Integration. App Service Environment.

CHOOSING A COMPUTE SOLUTION
Virtual Machines. Containers: Container Instances, Container Apps, AKS. App Services: Web Apps, Azure Functions. Compare Solutions: Cost, Security, Availability, Scalability.

SECURITY ARCHITECTURE
Role Based Access Control (RBAC). Options for Storing Sensitive Data. Key Vault. Managed Identities. Inbound/Outbound Internet Connectivity. Security Best Practices.

DESIGN FOR IDENTITIES
Microsoft Entra ID. Hybrid Options: Entra Connect versus Entra Cloud Sync. Sign In Options: MFA, Password-less Authentication. Entra ID as Central Identity Service for all Applications. Protection Features: Design Conditional Access Policies. External Identities: Lifecycle Management. Centralized versus Decentralized Identities: Verified IDs.

SECURING AND MONITORING MICROSOFT AZURE

AZURE MONITOR
Azure Monitoring Overview. Azure Monitor. Azure Advisor. Activity Log. Alerts and Metrics. Workbooks.

AZURE LOG ANALYTICS
Azure Monitor Logs. Log Analytics Workspace Data Collection. Log Data Structure. Workspace Design.

KUSTO QUERY LANGUAGE
Kusto Query Language. Writing Basic Log Queries. Filter Data. Aggregate Data. Using Variables. Joining Multiple Tables in a Single Query. Functions and Computer Groups.

MICROSOFT DEFENDER FOR CLOUD
Microsoft Defender for Cloud. Defender for Cloud Tiers and Pricing. Security Policies. Security Recommendations and Secure Score. Just in Time VM Access. Adaptive Application Controls. File Integrity Monitor. Adaptive Network Hardening. Security Alerts and Incidents.

MICROSOFT SENTINEL
Microsoft Sentinel Overview and Pricing. Activate Microsoft Sentinel. Onboard Security Sources: Data Connectors and Content Hub. Threat Intelligence. Watchlists. User and Entity Behavior Analytics (UEBA).

MICROSOFT SENTINEL INCIDENT INVESTIGATION AND THREAT HUNTING
Sentinel Analytics and Investigation. Security Orchestration Automation: Automation Rules and Playbooks. Threat Hunting. Workbooks and Notebooks.

02 DAYS
UASEC

28 - 29 November 2024
16 - 17 January 2025
13 - 14 March 2025

LEARNING GOALS
In this course you will learn the ins and outs of the monitoring and security features that are available in the Azure Cloud platform.

TARGET AUDIENCE
This course is intended for IT professional specialists responsible for analyzing and securing the cloud IT environment.

MICROSOFT ENTRA ID IDENTITY MANAGEMENT

MICROSOFT ENTRA OVERVIEW
Microsoft Entra Overview. Microsoft Entra ID Overview. Microsoft Entra ID Editions. Directories and Domains. Add a custom domain to Microsoft Entra ID.

ENTRA ID USERS, GROUPS AND DEVICES
User Management. Group Management. Dynamic Groups. Role Assignable Groups. Group-based Licensing. Group Settings. Device Management.

ENTRA ID FEATURES
Multi-Factor Authentication. Authentication Methods. Password Management. Company Branding. Custom Security Attributes.

ENTRA ID ROLES
Entra ID Roles. Administrative Units. Privileged Identity Management.

MICROSOFT ENTRA EXTERNAL ID
External Identities Overview. Identity Providers. Microsoft Entra External ID for Partners (B2B). Guest Access. Cross-Tenant Sync. B2B Direct Connect. Microsoft Entra External ID for Customers (B2C).

ENTRA ID IDENTITY GOVERNANCE
Entra ID Identity Governance Overview. Entra ID Entitlement Management. Access Packages. Connected Organizations. Access Reviews.

ENTRA ID PROTECTION
Single Sign On. Identity Protection. Conditional Access.

AZURE AD CONNECT
Directory Synchronization. Azure AD Connect. Azure AD Sync Options. Azure AD Connect Health.

ENTRA ID AUTHENTICATION OPTIONS
Password Hash Sync. Pass-Through Authentication. Seamless Single Sign On. Federation. Compare Authentication Solutions.

ENTRA ID APPLICATION MANAGEMENT
Application Management Overview. Gallery Applications. Entra ID Application Proxy. Custom Developed Applications. Managed Identities.

03 DAYS
UAAD

9 - 11 December 2024
3 - 5 March 2025
28 - 30 April 2025

LEARNING GOALS
One of the most important tasks of any administrator is to provide a secure, easy-to-manage identity system. For any Microsoft cloud service that system is Microsoft Entra ID.

TARGET AUDIENCE
IT Administrators responsible for user management in cloud services like Microsoft 365, Azure, Intune and Dynamics 365.

MANAGING CONTAINERS WITH KUBERNETES AND MICROSOFT AZURE

CONTAINERS
Containers Overview. Containers versus Virtual Machines. Container Fundamentals. Docker Editions.

WINDOWS AND LINUX CONTAINERS
Windows Containers. Linux Containers. Linux Containers on Windows.

DOCKER
Docker Overview. Docker Commands. Container Networking. Dockerfile. Docker Hub. Docker Compose. Docker Swarm.

APPLICATIONS IN CONTAINERS
Software Architecture Evolution. Microservices. .NET Core versus .NET Framework. Migrate Existing Applications. Databases and Containers.

KUBERNETES
Kubernetes Overview. Kubernetes Cluster. Cluster Hosting Options. Azure Kubernetes Service. Kubernetes Building Blocks: Pods, Volumes.

CONTAINER DEPLOYMENT WITH KUBERNETES
Deployments. Update a Deployment. Scaling. Networking in Kubernetes. AKS Networking Options. Services.

CONTAINER MANAGEMENT WITH KUBERNETES
Ingress. Secrets and ConfigMaps. Namespaces. Network Policies. Health Monitoring. Monitor the Kubernetes Cluster and Containers

CONTAINER TECHNOLOGY IN AZURE
Azure Container Registry. Azure Container Instances. Web App for Containers. Azure Container Apps.

03 DAYS
UACON

14 - 16 October 2024
16 - 18 December 2024
24 - 26 February 2025

LEARNING GOALS
In this course you will learn how to use Docker and Kubernetes to manage containers, both on-premises and in the Azure Cloud platform.

TARGET AUDIENCE
This course is intended for experienced IT professionals. The technologies learned in the course can be useful for both on-prem and Azure deployments.

05 DAYS
UASA

9 - 13 December 2024
10 - 14 February 2025
7 - 11 April 2025

LEARNING GOALS
In the Microsoft Azure stack, Synapse Analytics is the cornerstone service for the data engineer. It encompasses pipelines to copy data, Spark and SQL to transform and query data, Data Explorer for near realtime analysis and data exploration, and Power BI for reporting.

TARGET AUDIENCE
This course focusses on developers and administrators who are considering migrating existing data solutions to the Microsoft Azure cloud, or start designing new data oriented solutions in the Azure cloud.

DATA ENGINEERING WITH AZURE SYNAPSE ANALYTICS

THE MODERN DATA WAREHOUSE
From traditional to modern data warehouse. Comparing data warehouse with data lake. Lambda architecture. Overview of Big Data related Azure services. Getting started with the Azure Portal.

STORING DATA IN AZURE
Introduction Azure Storage. Comparison of Azure Blob Storage vs Azure Data Lake Storage Gen2. Create storage account and containers. Entra ID identification versus key based authentication. Folders and folder level permissions in Data Lake Gen 2 Working with the Azure Storage Explorer and AzCopy.

OVERVIEW OF AZURE SYNAPSE ANALYTICS
The different components of Synapse Analytics. Provisioning a Synapse Analytics workspace. GitHub setup. Navigating the Synapse Analytics Studio.

INTRODUCTION TO AZURE SYNAPSE ANALYTICS PIPELINES
Introducing Azure Synapse Analytics Pipelines. Pipeline terminology. Creating Pipelines, Linked Services and Datasets. Copying data with the Copy Data wizard.

AUTHORING PIPELINES IN AZURE SYNAPSE ANALYTICS
Adding activities to the pipeline. Working with Expressions. Variables and Parameters. Debugging a pipeline.

AUTHORING DATA FLOWS IN AZURE SYNAPSE ANALYTICS
From ELT to ETL. Creating Data flows. Sizing the Spark cluster. Running and Profiling Data flows.

MANAGING SYNAPSE PIPELINES
Integration Runtime Overview. The Azure Integration Runtime. The Self-Hosted Integration Runtime. Scheduling Pipelines using Triggers. Monitoring pipeline executions.

AZURE SQL DATABASE
Provisioning an Azure SQL Database. Migrating an on-premises Data Warehouse to Azure SQL Database. Ingesting Azure Blob Storage data. Working with Columnstore Indexes.

SERVERLESS SQL POOL IN AZURE SYNAPSE ANALYTICS
When Azure SQL Databases reach their limits. Provisioned versus Serverless Synapse Analytics databases. Creating and accessing Serverless databases. Using OPENROWSET for data access. Creating external tables.

AZURE SYNAPSE ANALYTICS PROVISIONED SQL POOLS
Architecture of Provisioned SQL Pools. Loading data via PolyBase. Create Table as Select Setting up table distributions: Round Robin, Hash and Replicate. Indexing. options

GETTING STARTED WITH APACHE SPARK OR DATABRICKS
Introduction Spark framework. Spark Cluster setup. Getting started with Notebooks. Introduction to Apache Spark on Databricks.

ACCESSING DATA IN SYNAPSE ANALYTICS SPARK
The Spark Session and Context objects. Connecting to Azure Blob Storage and Azure Data Lake Storage Gen2. Connecting to relation databases through JDBC or ODBC. Loading and saving data in Spark using DataFrames. An introduction to transforming data using PySpark. Using Spark SQL to query and transform data.

INTRODUCING DELTA LAKE
Introducing Delta Lake. Creating Delta Tables. Modifying data in a Delta Table. Time Travel with Delta Tables. Creating a Lake Database/Lakehouse in Azure Synapse Analytics. Querying a Lake Database/Lakehouse using the Serverless SQL Pool.

AZURE DATA EXPLORER
Data Explorer architecture. Ingesting data in Data Explorer. Querying and visualizing data with Kusto. Accessing Data Explorer from Data Factory and Power BI.

THE ROLE OF THE POWER BI SERVICE
Overview of Power BI Service. Analysis Services/Power BI in the modern data warehouse architecture. Link Synapse Analytics with Power BI.

05 DAYS
UFAB

21 - 25 October 2024
20 - 24 January 2025
27 - 21 March 2025

LEARNING GOALS
Microsoft Fabric is an all-in-one analytics solution for enterprises that covers everything from data movement to data science, real-time analytics, and business intelligence. It offers a comprehensive suite of services, including data lake, data engineering, and data integration, all in one place. In this 5-day course, you will learn about and experience the major parts of Microsoft Fabric.

TARGET AUDIENCE
This course is targeted to data engineers and BI professionals who want to build and use lakehouses and data warehouses using Microsoft Fabric.

DATA ENGINEERING WITH MICROSOFT FABRIC

INTRODUCTION INTO MICROSOFT FABRIC
What is Microsoft Fabric? From traditional data warehousing to data lakes. Data Mesh Architecture. Personas in Microsoft Fabric. Microsoft Fabric Licensing. Domains and Workspaces in Microsoft Fabric.

STORING DATA IN ONELAKE
Common Big Data storage formats. OneLake and Lakehouses in Fabric. Creating Lakehouses. Working with files and folders in a Lakehouse. Implementing a medallion architecture using Lakehouses. Securing data in OneLake. Working with Shortcuts.

WORKING WITH DELTA TABLES
What is a Delta Lake. Working with Delta Tables. Managing Schema change. Version and Optimize Delta Tables.

GETTING STARTED WITH DATA FACTORY
What is Data Factory? Pipelines vs Dataflows in Data Factory. Copy Data into a Lakehouse using Pipelines. Adding activities to a Pipeline. Working with precedence constraints.

AUTHORING ADVANCED PIPELINES
Working with Expressions. Variables and Parameters. Using Looping and Conditional Logic in pipelines. Debugging a pipeline.

INGEST AND TRANSFORMING DATA USING DATAFLOWS
Creating Queries to load data. Applying Transformations. Appending and Merging Queries. Query Folding. Using Dataflows inside a Pipeline. Managing connections.

BUILDING A SYNAPSE DATA WAREHOUSE
The SQL analytics endpoint of the Lakehouse. Creating tables in a Synapse Data Warehouse. Ingesting data using pipelines. Ingesting data using T-SQL. Querying the Warehouse. The Default Power BI semantic model.

SYNAPSE DATA ENGINEERING USING SPARK
Introducing Apache Spark. Creating Environments or Apache Spark clusters. Working with Notebooks in Fabric. Magic commands. Visual Studio Code integration. Source Control integration. Scheduling Notebooks. Microsoft Fabric decision guide: Copy activity, Dataflow or Spark.

DATA WRANGLING USING PYSPARK AND SPARK SQL
The SparkSession, SparkContext and SQLContext objects. Reading and writing data using DataFrames. Data Cleansing using PySpark. Grouping and aggregating data in PySpark. Joining DataFrames. Using Spark SQL to select and manipulate data. Visualizing data using Notebooks and DataFrames.

SYNAPSE REAL-TIME ANALYTICS IN FABRIC
Creating a KQL database. Ingesting data into tables. Query data using KQL. Create and manage EventStreams.

REPORTING IN FABRIC
Creating Power BI Reports. DirectQuery vs Import with Microsoft OneLake. Using and configuring Direct Lake mode.

DATA ACTIVATOR
Creating and using Reflexes. Defining Triggers, Conditions and Actions. Getting data from Reports or EventStreams.

DATA ENGINEERING WITH AZURE DATABRICKS

04 DAYS
UADB

THE MODERN DATA WAREHOUSE
From Data Warehouse to Data Lake. Building a Data Lakehouse with Delta Lake. The Databricks medallion architecture. Big Data storage formats.

GETTING STARTED WITH AZURE DATABRICKS
Introducing Apache Spark. Setup Azure Databricks using the Azure Portal. Manage Azure Databricks Workspaces. Create a Databricks Cluster. Cluster access mode and policies. Creating and running your first Notebook. Introduction to the Unity Catalog.

USING NOTEBOOKS IN AZURE DATABRICKS
The Databricks File System (DBFS). Working with Notebooks in Databricks. Magic commands. Databricks Utilities. Schedule Notebooks. Databricks Repos. The Databricks Assistant. Databricks widgets.

STORING DATA IN AZURE
Introduction Azure Blob Storage and Azure Data Lake Storage Gen2. Working with the Azure Storage Explorer and AzCopy. Accessing Azure Storage using Access Keys, SAS Tokens and. Service Principals. Accessing Azure Storage using Service Principals. Cluster Scoped Authentication.

ACCESSING DATA IN AZURE DATABRICKS
Introduction to Spark DataFrames. Reading and writing data using Spark DataFrames. Mounting Azure Blob and Data Lake Gen2 Storage. Cleaning and Transforming data using the Spark. DataFrame API. Databases and Tables in Azure Databricks. Managed vs Unmanaged Tables in the Hive metastore. Tables in the Unity Catalog. Scheduling Databricks Jobs.

BUILDING A LAKEHOUSE USING AZURE DATABRICKS
Implementing a Delta Lake. Working with Delta Tables. Managing Schema change. Version and Optimize Delta Tables. Data skipping and Z-order. Delta Tables and Change Data Feeds. Delta Tables and the Unity Catalog. Securing Tables in the Unity Catalog.

DELTA LIVE TABLES AND DATA PIPELINES
Structured Streaming. Working with Auto Loader. Introduction to Delta Live Tables (DLT). Using Python or SQL with DLT. Ingesting data using DLT. DLT and data quality. Configure DLT pipelines.

DATA WAREHOUSING AND ANALYSIS WITH DATABRICKS SQL
What are SQL Warehouses?. Writing queries using the SQL Editor. Working with Tables and Views. Ingesting Data. Visualizing data.

DATABRICKS AND POWER BI
Power BI Introduction. Connect Power BI Desktop to Databricks using Partner Connect. Connect Power BI Desktop to Databricks manually.

25 - 28 November 2024
3 - 6 February 2025
14 - 17 April 2025

LEARNING GOALS
Databricks is a data analytics platform powered by Apache Spark for data engineering, data science, and machine learning. This training teaches how to use Azure Databricks to design and build a data lakehouse architecture.

TARGET AUDIENCE
No prior knowledge of Azure Databricks is required.

PYTHON FOR DATA ENGINEERS: FROM SYNTAX TO SOLUTIONS

03 DAYS
UPDE

GETTING STARTED WITH PYTHON
Introducing to Python. Installing Python. Executing Python Code from the Command Shell. Python and Visual Studio Code. Working with packages in Python. Working with Virtual Environments in Python. Interactive development in Jupyter notebooks.

BASIC LANGUAGE CONSTRUCTS IN PYTHON
Introduction to writing Python code. Declaring and Using Variables. Data Types in Python. Working with Lists, Tuples, Sequences and Dictionaries. Basic Programming Constructs in Python. Declaring and executing Functions.

WORKING WITH CLASSES AND OBJECTS
Introduction to Object-Oriented Programming. Defining and instantiating Classes in Python. Working with Constructors. Instance and Class Variables. Inheritance in Python. Working with Access Modifiers.

USING AND CREATING MODULES
Introduction to Modules. Importing Modules. Creating Modules.

DATA PROCESSING AND CLEANSING USING PANDAS
What is Pandas. Introducing Pandas Data Structures. Reading data with Pandas. Indexing in a DataFrame. Creating and deleting columns. Filtering and Replacing data. Sorting and Ranking data. Grouping and aggregating data.

FROM PYTHON AND PANDAS TO APACHE SPARK
Introducing Apache Spark. The SparkSession, SparkContext and SQLContext objects. An introduction to Resilient Distributed Datasets (RDD). Convert a Pandas DataFrame to/from a PySpark DataFrame. Reading and writing data using DataFrames. Working with DataFrames in PySpark. Data Cleansing using PySpark. Grouping and aggregating data in PySpark. Joining DataFrames. Using SQL to select and manipulate data.

BUILDING A LAKEHOUSE USING DELTA LAKE
What Is a Lakehouse? Introduction to Delta Lake. Creating tables. Partitioning data in tables. Reading table data. Query older snapshots of a table (Time Travel). Insert, Update, Delete and Merge table data. Retrieving table metadata. Altering table metadata. Configuring Change Data Feed.

7 - 9 October 2024
2 - 4 December 2024
27 - 29 January 2025
24 - 26 March 2025

LEARNING GOALS
Python plays a crucial role in data engineering due to its versatility, extensive libraries such as Pandas and PySpark, and its ability to handle large-scale data processing, making it an indispensable tool for extracting insights and building data pipelines. In this course, participants will gain a solid understanding of Python.

They will acquire the necessary skills and knowledge to utilize Python effectively for data engineering tasks, from basic syntax to implementing real-world solutions. During the course participants will get hands-on experience with Pandas, PySpark, Delta Lake…

TARGET AUDIENCE
This course is targeted at data engineers with no or little experience with Python.

02 DAYS
UPUR

DATA GOVERNANCE WITH MICROSOFT PURVIEW

Microsoft Purview is a powerful data governance tool that helps organizations manage and understand their data across on-premises, multi-cloud, and SaaS environments. This course teaches you how to set up and configure Purview in Microsoft Azure, how to create and manage metadata, how to manage data classifications, and how to implement data discovery and lineage. The course is designed to be practical and hands-on, with plenty of opportunities to apply what you learn in the labs.
For more information, visit www.u2u.be/cc/upur.

05 DAYS
UASQLD

4 - 8 November 2024
20 - 24 January 2025
10 - 14 March 2025

LEARNING GOALS
This course provides students with the skills to develop a Microsoft Azure SQL database. The course focuses on teaching individuals how to use Azure SQL product features related to developing a database: logical table design, indexing and query plans. It also focusses on the creation of database objects including views, stored procedures and functions.

TARGET AUDIENCE
IT Professionals who want to become skilled on Azure SQL databases.

DEVELOPING AZURE SQL DATABASES

INTRODUCTION TO DATABASE DEVELOPMENT
Introduction to the SQL Server Platform. Azure SQL Database Development Tasks.

DESIGNING AND IMPLEMENTING TABLES
Designing Tables. Data Types. Working with Schemas. Creating and Altering Tables.

ADVANCED TABLE DESIGNS
Partitioning Data. Compressing Data. Temporal Tables. Ensuring Data Integrity through Constraints
Enforcing Data Integrity. Implementing Data Domain Integrity. Implementing Entity and Referential Integrity.

INTRODUCTION TO INDEXES
Core Indexing Concepts. Data Types and Indexes. Heaps, Clustered, and Nonclustered Indexes. Single Column and Composite Indexes.

DESIGNING OPTIMIZED INDEX STRATEGIES
Index Strategies. Managing Indexes. Execution Plans. The Database Engine Tuning Advisor. Query Store.

COLUMNSTORE INDEXES
Introduction to Columnstore Indexes. Creating Columnstore Indexes.

DESIGNING AND IMPLEMENTING VIEWS
Introduction to Views. Creating and Managing Views. Performance Considerations for Views.

DESIGNING AND IMPLEMENTING STORED PROCEDURES
Introduction to Stored Procedures. Working with Stored Procedures. Implementing Parameterized Stored Procedures. Controlling Execution Context.

DESIGNING AND IMPLEMENTING USER-DEFINED FUNCTIONS
Overview of Functions. Designing and Implementing Scalar Functions. Designing and Implementing Table-Valued Functions. Considerations for Implementing Functions. Alternatives to Functions.

RESPONDING TO DATA MANIPULATION VIA TRIGGERS
Designing DML Triggers. Implementing DML Triggers. Advanced Trigger Concepts.

USING IN-MEMORY TABLES
Memory-Optimized Tables. Natively Compiled Stored Procedures.

SQL SERVER CONCURRENCY
Concurrency and Transactions. Locking Internals.

PERFORMANCE AND MONITORING
Extended Events. Working with extended Events. Live Query Statistics. Optimize Database File Configuration. Metrics.

04 DAYS
UASQL

16 - 19 December 2024
24 - 27 February 2025
22 - 25 April 2025

LEARNING GOALS
Participants of this course will learn from both a DBA and database developer's perspective how to setup and implement Azure SQL databases. The complete database lifecycle from creating and configuring your servers and databases, developing new database objects or migrating existing databases and client applications will be covered.

TARGET AUDIENCE
This 4-day course is intended for DBA's and database developers. Participants of this course need to have a basic understanding of the Microsoft SQL Server platform.

ADMINISTERING AZURE SQL DATABASES

INTRODUCTION TO AZURE SQL
What is Azure SQL? Azure SQL Architecture. Azure SQL Pricing. Azure SQL Service Tiers and DTU's. Limitations of Azure SQL. Differences between Azure SQL Databases and Azure SQL Managed Instances.

PROVISIONING AZURE SQL DATABASES
Creating and configuring a Server in Azure SQL. Creating and configuring an Azure SQL Database. Implementing Firewall Rules. Azure SQL networking overview. Overview of the Azure SQL Management Tools.

PROVISIONING AZURE SQL MANAGED INSTANCES
Azure SQL Managed Instance overview. Differences between an On- Premises SQL Server and an Azure SQL Managed Instance. Virtual Networks and Azure SQL Managed Instances. Provisioning and configuring an Azure SQL Managed Instance. Accessing Azure SQL Managed Instances.

CREATING AND MIGRATING AZURE SQL DATABASES
Creating tables, views, stored procedures, ... Migrate an existing SQL Server database to Azure SQL. The Data Migration Assistant. Exporting and Importing BACPAC files of a SQL Database. The Azure Database Migration Service. Copy an Azure SQL Database.

AZURE SQL DATABASE CLIENT CONNECTIVITY
Connectivity Overview. Available Connectivity Libraries. Azure SQL Database Connection Strings.

ELASTIC DATABASES AND POOLS
Introducing Elastic Database Pools. Implementing Elastic Database Pools and working with eDTU's. Creating Elastic Database Pools. Configuring Elastic Databases. Monitoring Elastic Database Pools. Creating Elastic Jobs. Introducing instance pools in SQL Managed Instance.

SECURING USER ACCESS TO AZURE SQL
Authentication overview. Configuring Authentication. Configuring Authorization. Creating Logins and Users. Working with contained databases.

SECURING AZURE SQL
Network security. Auditing in Azure SQL. Azure Defender for SQL. Advanced Thread Protection. Always Encrypted. Data Discovery and Classification. Dynamic Data Masking.

MONITORING AND TUNING IN AZURE SQL
Working with Extended Events. The SQL Server Query Store. Query Performance Insight in Azure SQL Databases. Azure SQL Analytics. Automatic tuning in Azure SQL. Monitoring using DMVs.

BACKUP AND RESTORE IN AZURE SQL
Automatic backups in Azure SQL. Backup retention and storage. Configure Long-term backup retention. Perform manual backups with Azure SQL Managed Instances. Perform a Point-in-time restore. Long-term database restore. Geo-restoring databases.

HIGH AVAILABILITY AND DISASTER RECOVERY
Business Continuity overview. High Availability in the Basic, Standard and General-Purpose service tiers. High Availability in the Premium and Business Critical service tiers. Active geo-replication. Auto-failover groups.

TEAM DEVELOPMENT WITH AZURE DEVOPS

03 DAYS
UTFS

AZURE DEVOPS SERVICES
Azure DevOps: The big picture. Features. The Extensions Marketplace.

AZURE DEVOPS TEAM PROJECTS
Development Processes. Team Projects and Process Templates.

USING GIT
Version Control concepts. Distributed Source Control with Git. Git Clients: Command Line, Visual Studio or Visual Studio Code. Creating a local repository. Configuring your git repository. Checking the status of your repo. Staging files. Committing files, and then amending it. Comparing changes in files. Reverting commits. Finding the bad change using git bisect.

TEAM COLLABORATION WITH REMOTE REPOSITORIES
Remote repositories. Cloning a remote repository. Synchronizing with a remote repository. Resolving conflicts. Using Git Hooks.

WORKING IN ISOLATION WITH BRANCHES
Adding branches to your workflow. Branching Strategies - Using GitFlow. Merge vs. Rebase - keeping a linear history. Different Merge Strategies, i.e. Squash Merge. Managing your branches.

TEAM COLLABORATION WITH PULL REQUESTS
Protecting your branches with pull requests. Ensuring high quality code with Pull Requests. Versioning with Git Tags. Using Forks.

PROJECT MANAGEMENT WITH AZURE BOARDS
Iterative Development. Creating the project backlog. Work Items and Queries. Velocity and Forecasting.

PLANNING A SPRINT
Sprint Planning. Identifying user stores for the next sprint. Capacity planning. Defining tasks to complete a user story. Adjust work to fit team capacity. Sharing a sprint with stakeholders.

RUNNING THE SPRINT
Running a sprint. The daily standup meeting. Burndown chart. Team dashboard.

CONTINUOUS INTEGRATION WITH AZURE PIPELINES
What is Team Build? Doing Continuous integration. Authoring build using the designer and yaml. What are stages, jobs, tasks? Integrating with other systems (such as Azure and GitHub) using Service Connections. What are Build Agents?
Setting up a build agent in your enterprise network.

CONTINUOUS DEPLOYMENT WITH AZURE PIPELINES
Release management and continuous deployment. Release definitions. Approving releases with release gates. Choosing between deployment patterns. Notifications with Service Hooks.

INFRASTRUCTURE AS CODE
What is Infrastructure as Code? Authoring Bicep Templates. Deploying Bicep using Azure CLI. Using Continuous Deployment to create your infrastructure.

AZURE ARTIFACTS
Understanding Azure Artifacts. Creating a Package Feed. Pushing a Package. Understanding Upstream Sources. Versioning Packages. Using Artifacts in Azure Pipelines.

23 - 25 October 2024
16 - 18 December 2024
3 - 5 March 2025
28 - 30 April 2025

LEARNING GOALS
In this course you will learn about using Azure DevOps to manage the application development lifecycle, showing how DevOps can improve the efficiency and code quality of your team. You will perform project management, source control, build, release automation and infrastructure as code with Azure DevOps. Finally we will look at Azure Artifacts and how to integrate with DevOps.

TARGET AUDIENCE
Anyone who is involved in application development. Exercices don't require real coding skills.

GITOPS: INFRASTRUCTURE AS CODE WITH MICROSOFT AZURE

03 DAYS
UAIC

INTRODUCTION TO GITOPS
What is GitOps? Why should you use GitOps? How does GitOps work? GitOps Services and Tooling: Git(Hub), Azure DevOps, Kubernetes, Terraform, Flux,...

AZURE RESOURCE MANAGER TEMPLATES
Infrastructure as Code. Authoring ARM Templates. Parameters, Variables, Resources, Output. Nested Templates. Validating ARM Templates: Test Toolkit, Pester.

TERRAFORM
Terraform Features. Configuration and Providers. Variables, Resources, Secrets. Terraform State.

THE BICEP LANGUAGE
Benefits of Bicep Versus Other Tools. Install Bicep Tools. Author Resources. Parameters, Variables, Outputs. Validate Files with Bicep Linter. Migrate from ARM Templates to Bicep.

DESIRED STATE CONFIGURATION (DSC)
Benefits of Desired State Configuration. DSC Components: Configuration, Resources, Compilation. Enact Your Configuration: Push or Pull mode. Using Azure Automation for DSC.

USING GIT WITH GITHUB
Version Control concepts. Distributed Source Control with Git and GitHub. Creating a local repository. Cloning a remote repository. Staging files. Committing files. Branching Strategies. Using Forks. Merge vs. Rebase. Synchronizing with a remote repository. Pull Requests.

CONTINUOUS INTEGRATION WITH GITHUB ACTIONS
What is GitHub Actions? Doing Continuous integration. What are jobs and steps? Using variables. Defining and using secrets. Integrating with Azure using Service Principals.

CONTINUOUS DEPLOYMENT WITH GITHUB ACTIONS
Release management and continuous deployment Deploying Artifacts. Caching Dependencies. Using environments during deployment. Triggering workflows.

GITHUB WORKFLOW RUNNERS
Understanding Runners. Using GitHub hosted runners Setting up a Windows hosted runner Setting up a Linux hosted runner.

12 - 14 November 2024
27 - 29 January 2025
31 March - 2 April 2025

LEARNING GOALS
The idea of GitOps is having a Git repository that contains declarative descriptions of the infrastructure and an automated process to make the production environment match the described state. In this course, you will learn how to setup this kind of deployment.

TARGET AUDIENCE
IT Pros who are interested in learning how to deploy their cloud infrastructure in an easy, fully automated way.

05 DAYS
UJSWEB

7 - 11 October 2024
2 - 6 December 2024
10 - 14 February 2025
14 - 18 April 2025

LEARNING GOALS
This course is about front-end (client-side) web development. It's what the user sees, touches and experiences in the browser. You'll learn how to build modern, interactive websites by learning the fundamentals of HTML, CSS, and JavaScript. This course is about the browser not the server.

TARGET AUDIENCE
This course is independent of the server-side technology you are using, so feel free to attend whether you use PHP, ASP.NET, Python, Ruby on Rails... A basic understanding of programming - in whatever language- is advised.

PROGRAMMING WITH HTML, CSS AND JAVASCRIPT

INTRODUCTION TO THE WEB
Http Methods. Headers. Status Codes. Cookies. Redirection. Caching.

HTML FUNDAMENTALS
Anatomy of a page. How a page is parsed. Some important HTML elements. Styling and Behavior.

FORMS
Form Elements. How Forms Work. Useful Attributes and Functions. Validation.

ADVANCED ELEMENTS
Giving Meaning to Elements with Semantics. Displaying Graphics on Screen. Getting a Video on Screen. Displaying a Site inside a Site with IFrame.

CSS FUNDAMENTALS
Styling websites using CSS. CSS Selectors. Understanding Inheritance & Cascading behavior. Choosing the right unit.

PRINCIPLES OF WEB DESIGN
Layout and Composition. Color. Graphics. Typography. User Experience.

CSS POSITIONING
Understanding the Box Model. Flow. Display. Position.

RESPONSIVE WEB DESIGN
Responsive Design. Flex Box. Grid. Using Mediaqueries.

CSS FRAMEWORKS
Building Responsive Sites with Bootstrap. Making Modern Websites with Tailwind.

RESPONSIVE WEB DESIGN WITH BOOTSTRAP
Normalizing and Resetting. The Grid System. Utility classes. Customizing look & feel. Components: navigation, popovers ...

JAVASCRIPT INTRODUCTION
Why is JavaScript important? What is ECMAScript? Performance. Picking the right Libraries. Developer Tools.

JAVASCRIPT LANGUAGE FUNDAMENTALS
Using Variables. Primitives and Objects. Functions: more powerful than you'd expect. Understanding Scope. Error Handling. Best Practices. Strict Mode.

JAVASCRIPT COLLECTIONS
Storing multiple values in Arrays. Useful Functions and Operators. Using Objects as Dictionaries. Sets, Maps and Others.

DOM INTERACTION WITH JAVASCRIPT
Introduction to JavaScript. Understanding the DOM. DOM Selection and Manipulation. Event Handling.

OBJECT ORIENTED JAVASCRIPT
Class syntax. Prototypes. Using Properties to encapsulate your fields. The 'this' keyword explained.

ADVANCED JAVASCRIPT TECHNIQUES
Deconstructing Objects. The Spread Operator. How to Copy Objects. Optional Parameters in Functions. Functional Programming.

DEALING WITH ASYNC CODE IN JAVASCRIPT
Threading in JavaScript. Using Callbacks. Event Handling. Working with Promises. Async and Await.

STRUCTURING JAVASCRIPT APPLICATIONS AND TOOLING
Using Libraries. Content Delivery Networks. Getting Libraries with npm. Modules versus the Global Object. Bundling and Minification. PolyFills and Transpilers. TypeScript. Using Task Runners. Tools for Code Quality.

WORKING WITH FRAMEWORKS
The Evolution of Web Development. Framework Overview.

TALKING TO THE SERVER
Rest Service. Server-Side JavaScript. Fetching Data with the Fetch API. Syncing the Data.

USING BROWSER APIS
The Window Object. Storing Data on the Client. Dynamic Graphics. Accessing the File System. Device APIs. Check Compatiblity.

03 DAYS
UREACT

18 - 20 November 2024
22 - 24 January 2025
7 - 9 April 2025

LEARNING GOALS
In this training developers will learn how to use React and its component based development to create rich and dynamic websites.

TARGET AUDIENCE
This course targets professional web developers who are familiar with JavaScript.

DEVELOPING WEB APPS WITH REACT

INTRODUCING REACT
The Evolution of Web Development. Components Everywhere. Combining React with other Libraries. React Tooling.

REACT FUNDAMENTALS
React App Structure. What is JSX. JavaScript Expressions. JSX Tips and Tricks.

STATE AND PROPS
State in React Components. Props and Data Flow. Stateful and Stateless Components. Transferring Props.

HOOKS
Functional Components. State Hook. Effect Hook. Things to Know when Using Hooks. Building your own Custom Hooks.

WORKING WITH FORMS
What is in a Form? Value Binding to State. Controlled vs Uncontrolled Components. Sanitizing and Validating Input. Using Libraries to Manage your Forms.

TALKING TO THE SERVER
Fetch API. When and Where to Fetch Data? Using the Effect Hook.

COMPONENT COMPOSITION
props.children. Working with Context and the UseContext Hook. Rendering Dynamic Content with Render Props. Higher Order Components.

ROUTING
Introducing React Router. Paths and Parameters. Nesting Routes. Data APIs in React Router. Lazy Loading. Component Lifecycle.

PERFORMANCE
Virtual DOM. Using Memoization and the Callback Hook. Avoiding Computational Work. Avoiding Re-rendering. Pitfalls.

STATE MANAGEMENT
Externalizing State from Components. Redux: the State Management Pattern of Champions. Mobx: a Simpler, more Lightweight Alternative to Redux.

REDUX
What is Redux? Actors: Store, Actions, Reducers. View and Hooks. Asynchronous Actions. Tools.

JEST AND REACT
What is Jest? Creating Tests with Jest. Asynchronous Methods. Mocking. Testing React components using Snapshots.

BUILDING WEB APPS WITH ANGULAR AND TYPESCRIPT

03
DAYS
UANG
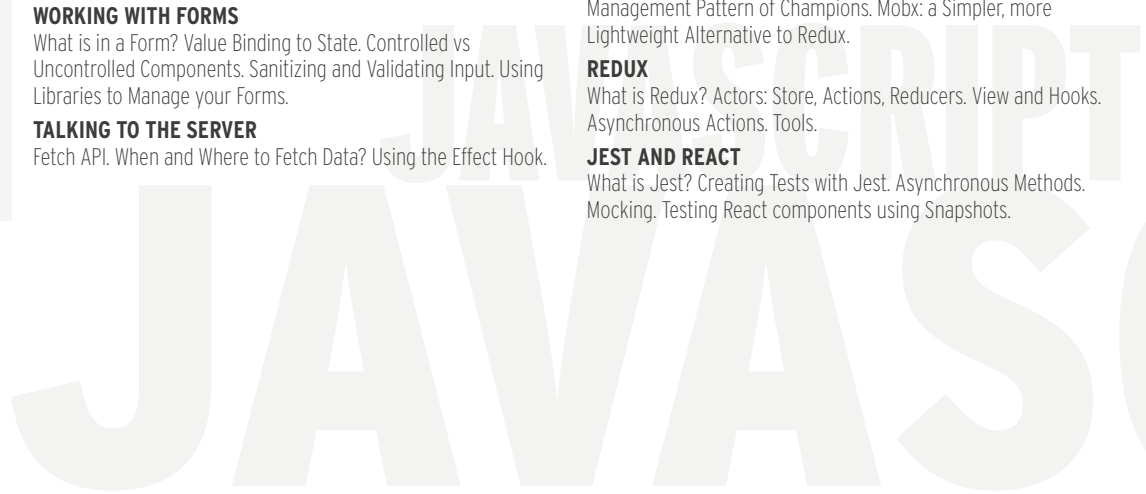
INTRODUCTION TO ANGULAR
Evolution in Web App Development. Basic Node.js and Angular project structure. Angular Core and Modules. TypeScript, Dart, Plain Old JavaScript.

STRONGLY TYPED JAVASCRIPT WITH TYPESCRIPT
Writing Application-Scale JavaScript. Type-Safe JavaScript Development with TypeScript. Typescript configuration. Implementing Types, Classes and Inheritance. Namespaces and Modules.

CORE CONCEPTS
Components. Standalone Components. Modules. Services. Angular CLI and other tools.

DATA BINDING
The Importance of Binding. Component to View. Structural Directives. Local Template Variables. Value Conversion. View to Component.

COMPONENTS
Using Multiple Components. Input and Output. ViewChild and ContentChild. EventEmitter. Directive Life Cycle.

ATTRIBUTE DIRECTIVES
Attribute Directives. Built-in Directives. Building Custom Attribute Directives.

CONTROL FLOW AND STRUCTURAL DIRECTIVES
Built-in Control Flow: @if, @for, @switch. Structural Directives: ngIf, ngFor, ngSwitch. Tracking Items in for Loops. Conditional Variables. Deferrable Views. Advanced Usage

DEPENDENCY INJECTION AND PROVIDERS
Terminology. Dependency Injection Basics. Services. Providers. Factories. Injection Tokens.

PIPES
Using a Pipe. Built-in Pipes. Custom Pipes. Pure versus Impure.

WORKING WITH FORMS
What's in a Form. Responding to Changes. FormBuilder. Data Validation.

TALKING TO THE SERVER
Sending and Receiving Data. HTTPClient Module. HTTP Interceptors. Observables versus Promises.

BUILDING A SINGLE PAGE APPLICATION
What is a SPA. Router Module. Route Configuration. Parent-Child Navigation. Route Guards.

16 - 18 October 2024
16 - 18 December 2024
17 - 19 February 2025
22 - 24 April 2025

LEARNING GOALS
By using a componentized approach, Angular is better equipped than ever to build performant data-driven web-apps. While Angular takes care of data binding, navigation and server communication; TypeScript allows you to use the most advanced features JavaScript has to offer on any browser.

TARGET AUDIENCE
Good understanding of JavaScript, HTML and CSS and a notion of node.js and npm.

MASTERING ANGULAR

03
DAYS
UANGA

REACTIVE EXTENSIONS FOR JAVASCRIPT
What are Reactive Extensions. Observable and Observer. Subjets. Cold versus Hot Observables. Making Async Calls. Combining Observables. Error Handling. Dealing with Back Pressure.

CHANGE DETECTION
Zones. How Change Detection Works. Immutables and Observables.

BUILT-IN REACTIVITY WITH SIGNALS
What are Signals, and Why do I Need Them? Signal, WritableSignal and ComputedSignal. Handling Side-Effects. Using Signals as Inputs. Two-Way Binding between Components. Signals and RxJS.

STATE MANAGEMENT WITH NGRX
The Redux Pattern. Major Principles. The Store, Actions and Reducers. Using RxJS within Redux. Efficient Slicing. Using Async Pipes. Tools.

BRINGING REDUX TO ANGULAR WITH NGRX
Using RxJS within Redux. Efficient Slicing. Using Async Pipes.

THE NGRX STORE
Responsibilities. Normalizing Data. Initializing the Store.

NGRX REDUCERS
Useful Operators. Splitting Up Reducers. NgRx Effects.

SMART AND DUMB COMPONENTS
Characteristics of Dumb Components. Characteristics of Smart Components. Performance Impact.

STRUCTURING AN APPLICATION
Domain, Routing, Core and Shared Modules. Exporting and Providing. Clean Imports. Creating Libraries.

FORMS ADVANCED
Dynamically Adding Elements. FormArray. Nested Forms.

ANGULAR UNIVERSAL
AOT versus JIT compilation. Server-side rendering with Angular Universal. Hot-Loading with pre-boot.

TESTING
Challenges. Unit Testing. Jasmine Features. Karma. Writing Testable Code. Getting Started. Isolated Tests. Angular Testing Utility APIs.

CUSTOM COMPONENTS WITH SVG AND CANVAS
SVG Graphics. Canvas Graphics. Animating Graphics.

ANGULAR ELEMENTS
Custom Elements. Transforming Angular Components to Custom Elements. Packaging and Using your Custom Element.

13 - 15 January 2025
3 - 5 March 2025

LEARNING GOALS
This training will take you from being an average Angular developer to a great one. You'll gain more insight in the workings of Angular and you'll explore more advanced programming techniques like RxJS, Redux and Advanced Forms. This course is constantly being updated to the latest version of Angular, currently Angular 13.

TARGET AUDIENCE
This course targets professional web developers who really want to master Angular. Participants of this course need to have a decent understanding of Angular and TypeScript.

05 DAYS
USPOP
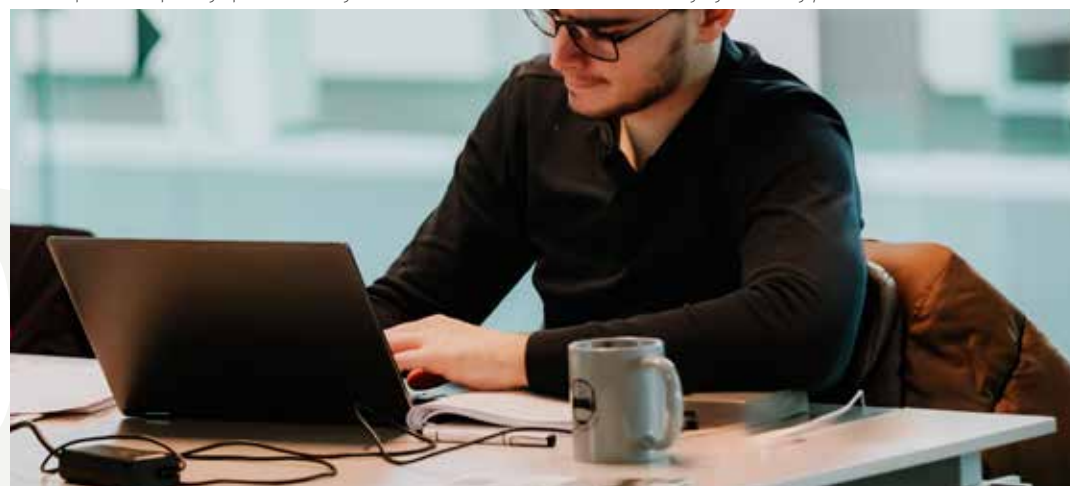
14 - 18 October 2024
2 - 6 December 2024
20 - 24 January 2025
3 - 7 March 2025

LEARNING GOALS
You will leave the training with the skills to build powerful collaboration and intranet environments in SharePoint Online while integrating many Microsoft 365 products like Microsoft Teams, Power Apps and Power Automate.

TARGET AUDIENCE
This course targets both IT professionals and business users interested in learning the ins and outs of the SharePoint Online functionalities. No prior SharePoint Online knowledge is required.

SHAREPOINT ONLINE FOR POWER USERS

POSITIONING SHAREPOINT ONLINE AND MICROSOFT 365
Understanding Microsoft 365 & Office 365. Overview of Microsoft 365 Services. Microsoft 365 & Office 365 Licensing.

MODERN SHAREPOINT SITES
What is a SharePoint Site? Creating and configuring SharePoint Sites. Microsoft 365 Groups. Team Sites vs. Communication Sites. Classic vs Modern Sites. Configuring Sites. Site Templates. Changing the look and feel. Site Usage.

BUILDING MODERN COLLABORATION & INTRANET ENVIRONMENTS
Structuring SharePoint Sites. What are Site Collections? What are Hub Sites? Hub Site Navigation. Shared Look and Feel. Hub Permissions. Hub Site Content Aggregation. Configuring the Home Site. Planning Global Navigation.

CONTENT MANAGEMENT IN SHAREPOINT ONLINE AND MICROSOFT LISTS
Fundamentals of Lists and Libraries. Comparing Lists in SharePoint Online, Microsoft Teams and Microsoft Lists. Working with metadata and different column types. Terms and Term Sets. Working with the Details Pane. Filtering data in a List or Library. Managing what you see with views. Formatting views in a rich and customized way. Exporting and Importing Data.

DOCUMENT MANAGEMENT
Working with Views in Modern Document Libraries. Keep track of different versions. Configure check-out and Approval. Receive email Alerts. Co-Authoring on Office documents. Recycle Bin.

MANAGING CONTENT TYPES
Providing reusable metadata with Site Columns. Terms and TermSets Content Type guidelines. Working with Document Templates. Publishing of Enterprise Content Types with the Content Type Gallery. Grouping documents in Document Sets.

WORKING WITH MODERN PAGES
Working with Modern Site Pages. Enriching your pages with web parts. Authoring and publishing a Modern Page. Scheduling. Publishing News. Page approval. Multilingual Pages.

ONEDRIVE FOR BUSINESS
Store Work Files in OneDrive. OneDrive Mobile Apps. Synchronize your documents with different devices. Files On-Demand.

MICROSOFT TEAMS
What is Microsoft Teams? What is a Team? Team Creation process. Teams Functionality. Connection between Teams and SharePoint.

VIVA CONNECTIONS
Introducing Microsoft Viva Connections. Configuring SharePoint Online Prerequisites. Setup Viva Connections. The Viva Connections Feed. Authoring a Microsoft Viva Connections Dashboard in SharePoint. Branding and Deploying the Viva Connections app in Microsoft Teams.

USER MANAGEMENT & PERMISSIONS
Authentication and Authorization. SharePoint Security Architecture. Managing Membership with Microsoft 365 Groups. Sharing Content in SharePoint. Configure and Manage Sharing Settings. External Sharing. Guest and Anonymous Access.

MICROSOFT SEARCH
What is Microsoft Search? Search Query Syntax. Managing the Search Schema. Manage Bookmarks, Acronyms and Q&A. Index third-party data with Microsoft Graph Connectors. Customize the end-user UX: Verticals, Result types and Search Result Layouts.

COMPLIANCE FEATURES
Compliance Overview. Keeping necessary data with Data Retention. Protecting important information with Sensitivity Labels. Prevent Data Disclosure with Data Loss Prevention.

MICROSOFT POWER APPS
What is Microsoft Power Apps? Power Apps Flavours. Power Apps pricing. Creating a Power App from a template, from a data source or from blank. Adding Screens and controls to your app. Building custom SharePoint list forms with Power Apps. Adding a Power App as a webpart to a SharePoint page.

MICROSOFT POWER AUTOMATE
What is Microsoft Power Automate? Power Automate pricing. Using out-of-the-box flows in SharePoint Online. Building flows from a template. Working with modern approvals. Building flows from scratch: Adding triggers and actions. Running and managing flows.

DEVELOPING WITH THE SHAREPOINT FRAMEWORK

05 DAYS
USPFX

WHAT IS SHAREPOINT FRAMEWORK
SharePoint Framework overview. SharePoint Framework tools. Key SPFX features. Road map.

PREPARING YOUR MACHINE FOR THE SHAREPOINT FRAMEWORK
Visual Studio Code. Introducing Node.js, Yeoman, Gulp and Webpack.

BUILDING CLIENT-SIDE WEB PARTS
Client-side Web Parts Fundamentals. Web Part Project Structure. Full Page Apps. Creating Teams Tabs with SPFx.

STRONGLY TYPED JAVASCRIPT WITH TYPESCRIPT
What is Typescript? Typescript Transpilation and Configuration. Language Features. Namespaces and Modules.

WEB PART PROPERTIES
The Property Pane. Custom Property Controls. Validation. Property Pane Life Cycle.

LOADING SHAREPOINT DATA IN SPFX
The REST Endpoints. Using the SPClient to Get Data. PnPjs. SharePoint List Subscriptions (webhooks).

LOADING OTHER FRAMEWORKS
npm Modules. Loading JavaScript libraries. Using CDNs for getting libraries. Bundling and Externals.

DEPLOYMENT OVERVIEW
The App Catalog. Versioning. Deploying SharePoint Assets & Extensions. Tenant-wide, Site Collection or Site specific deployments. Deploying to Microsoft Teams.

USING AND BUILDING REACT COMPONENTS FOR THE SHAREPOINT FRAMEWORK
React App Structure. What is JSX? JavaScript Expressions. JSX Tips and Tricks. React Components.

REACT COMPONENTS DEEP-DIVE
Multiple Components. Transferring Props. Component State & Lifecycle. Form Components. React Virtual DOM.

BRAND YOUR CLIENT WEB PARTS WITH SASS AND FLUENT UI
Introducing SASS. SASS Variables, Mixins, Nesting, functions, ... SASS Preprocessing. Fluent UI styles. Fluent UI Fabric components.

CONNECTING TO MICROSOFT GRAPH AND ENTRA ID SECURED API'S
Register Custom Applications on Entra ID. The Microsoft Graph API. Consuming Microsoft Graph. API Permissions in SharePoint. Using Other Protected API's. Domain Isolated Web Parts.

SHAREPOINT FRAMEWORK EXTENSIONS
Creating an Application Customizer. Creating a Field Customizer. Creating a Command Set. Executing Scripts. Build your own Form. Build Adaptive Card Extensions.

USING THE GRAPH TOOLKIT WITH SPFX
Graph Toolkit. React Components. Building Teams Tab. Customizing Graph Toolkit Components. Authentication Providers.

DYNAMIC DATA
Writing a Data Provider and Data Consumer. Data Serialization. Handling Data Updates.

UNIT TESTING
Unit testing with Enzyme, Sinon and Chai. Running tests using Karma & Jest.

TIPS AND TRICKS
Debugging. Application Insights. Custom Gulp Tasks. Bundles in WebPack.

4 - 8 November 2024
27 - 31 January 2025
7 - 11 April 2025

LEARNING GOALS
SharePoint Framework offers us the tools to build custom solutions for the modern Microsoft 365 experience, targeting SharePoint, Viva and Teams. In this deep-dive development course we will learn the way to efficiently work with Node.js, React and Typescript. Using this toolset we can build modern SharePoint web parts, Teams tabs, Viva Connections Cards and other extensions to Microsoft 365. We will see how to connect to various data sources like Microsoft Graph, Secured API, etc...

TARGET AUDIENCE
Participants ideally have some development experience. No TypeScript or JavaScript experience is required, but recommended. Knowing how to use SharePoint is advised.

MODERN MICROSOFT 365 DEVELOPMENT

04 DAYS
USPOAP

INTRODUCTION TO SHAREPOINT AND MICROSOFT 365 DEVELOPMENT
Microsoft 365 Overview. SharePoint Development Options. Exploring the Microsoft 365 APIs.

MICROSOFT IDENTITY PLATFORM
Microsoft Identity Platform Overview. Registering your Apps in Entra ID. OAuth Authentication Flows. Authenticating Users and Applications. Microsoft Authentication Libraries (MSAL).

INTRODUCING MICROSOFT GRAPH
Connecting to Microsoft Graph. Writing Code with the .NET Microsoft Graph SDK. Batching Requests. Using Graph Extensions.

WORKING WITH MICROSOFT GRAPH
Users, Mails and Calendars. Automating Teams Provisioning and Configuration. Working with Sites, Pages, Files, Drives and Driveitems.

CUSTOMIZING MICROSOFT SEARCH WITH MICROSOFT GRAPH
Customize your Search Experience with Verticals, Result Types, Search Result Layouts, Filters, and Microsoft Graph Connectors. Querying Data with the Search API. Make External Data searchable with the Search API.

USING THE MICROSOFT GRAPH TOOLKIT
The Graph Toolkit. Graph Web Components. React Components. Building Teams Tab with Graph Toolkit. Customizing Graph Toolkit Components. Authentication Providers.

INTRODUCTION TO SHAREPOINT EMBEDDED
Why use SharePoint Embedded. Setting up SharePoint Embedded. SharePoint Embedded Architecture. Creating SharePoint Embedded Containers. Working with Files and Folders. Visualizing Documents. Using the Search API.

RESPONDING TO LIST EVENTS WITH GRAPH WEBHOOKS
Webhook Subscriptions and Event Notifications. Getting Change Details. Debugging Webhooks.

MICROSOFT TEAMS DEVELOPMENT OVERVIEW
Options for creating Microsoft Teams Apps. Adapting existing app with the Teams SDK. Creating Adaptive Cards. Using the Microsoft Teams Toolkit for Visual Studio. App elements: Tabs, Bots, Connectors, Message Extensions.

CREATING COLLABORATIVE APPLICATIONS WITH THE MICROSOFT FLUID FRAMEWORK
The Fluid Working Flow. Fluid Architecture. Fluid Containers and Distributed Data Structures. Testing with Tinylicious. The Azure Fluid Relay.

EXTENDING COPILOT FOR MICROSOFT 365
Introducing Copilot for Microsoft 365. Plugins for Copilot. Extending with Power Platform connectors. Extending with Teams Message Extensions. Extending with Graph Connectors for Search. Extending with the Copilot Studio.

16 - 19 December 2024
24 - 27 February 2025
22 - 25 April 2025

LEARNING GOALS
Microsoft 365 offers exciting and contemporary ways to develop for SharePoint, Microsoft Teams, and other parts of Microsoft 365. This course will teach you the essential knowledge, best practices, tools and techniques for adding your .NET creations to the Microsoft 365 ecosystem. With this course, you'll be able to create stunning and collaborative applications.

TARGET AUDIENCE
If you are a developer who wants to take your Microsoft 365 skills to the next level, this course is for you. Being familiar with .NET is required. Some basic knowledge of Javascript is recommended.

04 DAYS
U0365A

9 - 12 December 2024
3 - 6 February 2025
31 March - 3 April 2025

LEARNING GOALS
Microsoft 365 delivers the power of cloud productivity to businesses of all sizes, helping save time and money. In this course, you will learn about the main Microsoft 365 services: Exchange Online, SharePoint Online, Teams and Microsoft Entra ID.

TARGET AUDIENCE
This course is designed for experienced IT Professionals, IT Decision Makers, Administrators... who will be responsible for configuring and managing an Microsoft 365 environment.

CONFIGURING AND ADMINISTERING MICROSOFT 365

UNDERSTANDING MICROSOFT 365
Introduction to Microsoft 365. Key Office 365 Features. Microsoft 365 Security & Privacy.

MICROSOFT CLOUD OFFERINGS
Microsoft Entra ID. Office 365. Intune. Security. Enterprise Mobility and Security. Microsoft 365.

MANAGING MICROSOFT 365
Managing Clients. Deploying Microsoft 365 Apps. Microsoft 365 Admin Center. Connecting to Microsoft 365 with PowerShell and/ or Microsoft 365 CLI.

MICROSOFT ENTRA ID
Microsoft Entra ID Overview. Microsoft Entra ID Editions. Add your domain to Entra ID. User and Group Management. Managing Entra ID with PowerShell. Entra ID Security Roles. Microsoft Entra External ID.

MICROSOFT ENTRA ID SIGN-IN OPTIONS
Azure AD Connect. Directory Synchronization. Password Synchronization. Pass-Through Authentication. Federation.

EXCHANGE ONLINE
Exchange Online Feature Overview. Management Tools. Role-based Access Control. Creating and Managing Recipients. Exchange Online Archiving. Exchange Online Transport Rules.

MICROSOFT 365 GROUPS
Microsoft 365 Groups Overview. Creating Microsoft 365 Groups. Microsoft 365 Group Connectors. Microsoft 365 Groups Administration.

MICROSOFT TEAMS
Microsoft Teams Feature Overview. Teams Clients. Teams Admin Tools. Teams Policies. Communication Services: Presence, Chat, Audio/Video. Meetings, Webinars and Live Events. Cloud Voice: Phone System, Call Queues, Dial Plans. Collaboration Services: Teams, Channels, Tabs, Apps and Connectors. External Access and Guest Users.

SHAREPOINT ONLINE ARCHITECTURE
Modern SharePoint Team Sites and Communication Sites. Connecting Environments with Hub Sites. Self Service Site Creation Governance. Building Modern Collaboration & Intranet Environments. SharePoint Lists and Libraries.

SHAREPOINT ONLINE ADMINISTRATION
External Access. SharePoint Migration Tool. Content Services: Term Store, Content Type Gallery. SharePoint Modern Search.

MICROSOFT 365 SECURITY
Microsoft Defender for Office 365. Anti-malware Protection. Anti spam Protection. Anti-phishing and Anti-spoofing. Email Authentication: SPF, DKIM and DMARC. Attack Simulator. Safe Attachments and Safe Links. Threat Protection for Collaboration. Threat Protection Reports and Secure Score.

MICROSOFT 365 COMPLIANCE
Microsoft Purview Compliance Portal Overview. Information Protection: Sensitivity Labels and Data Loss Prevention. Data Life-cycle Management: Retention Labels and Policies eDiscovery. Auditing and Alert Policies. Compliance Score.

COPILOT FOR MICROSOFT 365
Copilot for Microsoft 365 Logical Architecture. Copilot Key Components: Large Language Models, Natural. Language Processing, Microsoft Graph. Prerequisites for Copilot for Microsoft 365. Copilot for Microsoft 365 Licensing.

03 DAYS
UINT

18 - 20 November 2024
13 - 15 January 2025
28 - 30 April 2025

LEARNING GOALS
With Microsoft Intune you can manage all devices in your organization: mobile devices (Android, iOS), Windows, Linux and Mac devices. Intune helps you to configure and control machines, deploy apps and keep your data secure. In this course you will learn about all the aspects of the Intune service.

TARGET AUDIENCE
This course is intended for IT professionals responsible for managing devices in the cloud.

MICROSOFT ENDPOINT MANAGER: CONFIGURING DEVICES WITH MICROSOFT INTUNE

INTUNE OVERVIEW
Intune Subscriptions. Intune Management. Mobile Device Management (MDM). Mobile App Management (MAM). Microsoft Entra ID. Role-Based Acces Control (RBAC).

DEVICE ENROLLMENT
Device Enrollment. Device Management Capabilities. Enrollment Options. Windows Enrollment. Android Enrollment. MacOS, Linux and iOS Enrollment.

DEVICE CONFIGURATION
Configure Device Profiles. Configure Device Features. Configure Device Restrictions. Configure Settings: Email, VPN, Wi-Fi. Administrative Templates. Upgrade Editions. Kiosk Devices.

APP MANAGEMENT
App Lifecycle. Add apps to Intune: Store Apps - Office 365 - Web Apps - LOB Apps - Win32 Apps - PowerShell Scripts. Monitor Apps. App Configuration Policies.

DEVICE AND APP PROTECTION
Device Compliance Policies. App Protection Policies. Windows Information Protection. Conditional Access.

ENDPOINT PROTECTION
Endpoint Protection. Microsoft Defender for Endpoint. Integration between Intune and Defender for Endpoint. Enforce Compliance with Conditional Access. Remediate Vulnerabilities.

DEVICE MANAGEMENT
Lock, Restart or Remove Device. Locate Lost Device. Logout or Remove User. Bypass Activation Lock. Reset Passcode. Remote Control Mobile Devices. Synchronize Device.

KIOSK DEVICES
Windows Kiosk Devices. Android Kiosk Devices. iOS Kiosk Devices.

WINDOWS AUTOPILOT
Windows Autopilot Overview. Windows Autopilot Requirements. Deployment Scenarios. Administering Windows Autopilot.

MASTERING MICROSOFT CLOUD CYBERSECURITY

05 DAYS
UCSEC

CLOUD SECURITY OVERVIEW
Threat Landscape. Common Threats and Attack Types. The Defender's Dilemma. Identity and Access Management. Threat Protection. Security Management. Information Protection.

SECURING YOUR CLOUD IDENTITIES
Multi-Factor Authentication. Privileged Identity Management. Identity Protection. Conditional Access.

MICROSOFT DEFENDER FOR IDENTITY
Microsoft Defender for Identity Features. Configuring Defender for Identity. Protecting Your Accounts. Identify Threats: Reconnaissance and Lateral Movement. Detect Pass-the-Hash and Pass-the-Ticket Attacks.

MICROSOFT DEFENDER FOR OFFICE 365
Protect Against Malware, Spam, Phishing, Spoofing. Email Authentication: SPF, DKIM and DMARC. Attack Simulator. Safe Attachments and Safe Links. Threat Protection for Collaboration: SharePoint, OneDrive and Teams. Secure Score.

MICROSOFT DEFENDER FOR ENDPOINT
Protect Your Devices. Onboarding Devices. Endpoint Detection and Response. Threat and Vulnerability Management. Secure Score for Devices.

MICROSOFT DEFENDER FOR CLOUD APPS
Cloud Discovery. App Connectors. Control Access to Apps with Policies. Conditional Access App Control. Protect Sensitive Information.

DETECT AND STOP ATTACKS WITH MICROSOFT 365 DEFENDER
Protect Your Environment. Onboard Security Services. Attack Investigation. Threat Hunting. Microsoft Copilot for Security.

INFORMATION GOVERNANCE AND PROTECTION
Microsoft Purview Compliance Portal Overview. Sensitive Information Types. Trainable Classifiers. Sensitivity Labels. Data Loss Prevention. Retention Labels and Policies. Communication Compliance.

INFORMATION INSIGHTS AND DISCOVERY
eDiscovery. Auditing and Alert Policies. Compliance Manager. Data Classification. Insider Risk Management. Privacy Management.

AZURE MONITOR
Azure Monitoring Overview. Azure Monitor. Azure Advisor. Activity Log. Alerts and Metrics. Workbooks.

AZURE LOG ANALYTICS
Azure Monitor Logs. Log Analytics Workspace. Data Collection. Log Data Structure. Workspace Design.

KUSTO QUERY LANGUAGE
Kusto Query Language. Writing Basic Log Queries. Filter Data. Aggregate Data. Using Variables. Joining Multiple Tables in a Single Query. Functions and Computer Groups.

MICROSOFT DEFENDER FOR CLOUD
Microsoft Defender for Cloud. Defender for Cloud Tiers and Pricing. Security Policies. Security Recommendations and Secure Score. Just in Time VM Access. Adaptive Application Controls. File Integrity Monitor. Adaptive Network Hardening. Security Alerts and Incidents.

MICROSOFT SENTINEL
Microsoft Sentinel Overview and Pricing. Activate Microsoft Sentinel. Onboard Security Sources: Data Connectors and Content Hub. Sentinel Analytics and Investigation. Security Orchestration Automation. Threat Hunting. Workbooks and Notebooks.

25 - 29 November 2024
13 - 17 January 2025
10 - 14 March 2025

LEARNING GOALS
Securing your cloud infrastructure can be complex and challenging in today's world where users are working from any location on any type of device. To support organizations in protecting themselves from several kinds of attacks, Microsoft offers a broad range of cloud security services targeted at both Microsoft Azure and Microsoft 365. In this training you will learn how to investigate, respond to, and hunt for cyberthreats. You will leave the training with the skills to reduce your organizational risk, respond rapidly to active attacks and advise on improvements to threat protection practices.

TARGET AUDIENCE
This course is intended for system administrators and security specialists responsible for securing and analyzing the cloud IT environment.

MANAGING MICROSOFT TEAMS

03 DAYS
MS-700

EXPLORE MICROSOFT TEAMS
Explore capabilities in Microsoft Teams. Microsoft Teams architecture. Integration with Microsoft 365 Groups, Power Platform, SharePoint, OneDrive and Exchange. Understand Microsoft Teams certified solutions.

PLAN AND DEPLOY MICROSOFT TEAMS
Understand Teams management tools. Plan for Teams rollout. Plan for Teams licensing.

IMPLEMENT LIFECYCLE MANAGEMENT AND GOVERNANCE FOR MICROSOFT TEAMS
Plan for lifecycle management: Groups Creation, Expiration and Naming Policies. Plan policy assignment for users and groups. Create and manage teams templates.

MONITOR YOUR MICROSOFT TEAMS ENVIRONMENT
Monitor Microsoft Teams usage reports. Microsoft Adoption Score. AAD Access Reviews.

MANAGE ACCESS FOR EXTERNAL USERS
Work with external users in Microsoft Teams. Manage guest access in Microsoft Teams.

IMPLEMENT SECURITY FOR MICROSOFT TEAMS
Configure conditional access. Multifactor authentication. Safe Attachments and Safe Links.

IMPLEMENT COMPLIANCE FOR MICROSOFT TEAMS
Sensitivity labels. Retention policies. Data Loss Prevention policies. Deploy communication compliance. Create and manage compliance recording policies.

PLAN AND CONFIGURE NETWORK SETTINGS FOR MICROSOFT TEAMS
Examine network requirements for Microsoft Teams. Configure tenant data for Call Quality Dashboard reports. Assess network readiness.

CREATE AND MANAGE TEAMS
Create and manage teams. Configure dynamic membership. Archive restore and delete a team.

MANAGE COLLABORATION EXPERIENCES FOR CHAT AND CHANNELS
Create and manage channels. Create and manage Teams policies for channels. Create and manage messaging policies.

MANAGE APPS FOR MICROSOFT TEAMS
Explore apps in Microsoft Teams. App Policies. Publish custom apps to Microsoft Teams.

MANAGE MEETINGS AND EVENTS EXPERIENCES
Explore meetings and events. Configure meeting settings and policies. Configure and manage Microsoft Teams Room and Teams devices Plan for Teams Rooms deployment. Manage devices in Microsoft Teams.

MANAGE PHONE NUMBERS AND SETTINGS
Evaluate Microsoft Teams calling solutions. Get phone numbers with Calling Plans. Manage phone numbers and voice settings.

MANAGE TEAMS PHONE SETTINGS AND POLICIES
Explore Teams Phone. Call queues and auto attendants. Calling policies.

TROUBLESHOOT AUDIO, VIDEO, AND CLIENT ISSUES
Troubleshoot Teams. Use Power BI to analyze Call Quality Dashboard data.

20 - 22 November 2024
10 - 12 February 2025

LEARNING GOALS
In this course, you will learn about various Teams management tools, security and compliance features for Teams, network requirements for Teams deployment as well as different Teams settings and policies for managing collaboration and communication experience in Teams.

TARGET AUDIENCE
A Microsoft Teams administrator plans, deploys, configures and manages Microsoft Teams to focus on efficient and effective collaboration.

03 DAYS
UPSHELL

21 - 23 October 2024
2 - 4 December 2024
3 - 5 February 2025
24 - 26 March 2025

LEARNING GOALS
PowerShell is a powerful tool for automating tasks and managing systems across different platforms. In this course you will learn to work with objects, connect to remote systems and write basic scripts. PowerShell can be used to manage your on-prem Windows and Linux systems as well as many cloud services like Exchange Online, SharePoint Online and Teams.

TARGET AUDIENCE
System Engineers who are responsible for the management and configuration of multiple Servers, Microsoft applications or a Microsoft Cloud Infrastructure. Developers interested in automation of test environments, interfacing with C#, embedding PowerShell in their application.

SCRIPTING WITH POWERSHELL

POWERSHELL OVERVIEW
PowerShell Overview. Brushing up on objects. PowerShell Versions. Windows PowerShell versus PowerShell Core. Concepts and Terminology. Getting Commands. Getting Help. Providers and Drives.

POWERSHELL SHELLS
PowerShell Console. Integrated Scripting Environment (ISE). Visual Studio Code.

CORE CONCEPTS
Viewing Object Structure. Object Pipeline. Using Format Cmdlets to Change Output. Export Data with Out Cmdlets. Using Variables to Store Objects.

OBJECT PIPELINE PROCESSING
Where-Object. Foreach-Object. Select-Object. Sort-Object. Measure-Object. Compare-Object. Group-Object. Tee-Object.

WORKING WITH OBJECTS
Files and Folders. Registry Keys and Values. COM Objects. WMI Objects - CIMCmdlets. .NET Objects. Static Classes.

EXTENDING POWERSHELL FUNCTIONALITY
Modules. Package Manager. PowerShell Gallery. PowerShell Profiles. Operators and Expressions.

POWERSHELL SECURITY
PowerShell Execution Policy. Script Signing. Security Sensitive Information in Scripts.

POWERSHELL REMOTING
PowerShell Remoting Overview. WS-Management (WSMAN). Remote CIM Sessions. Import/Export Remote Sessions. WinRM Security. WinRM Double Hop Problem. Using Variables in Remoting Sessions. Remoting with PowerShell Core.

POWERSHELL JOBS
Background Jobs. Remoting Jobs. Scheduled Jobs.

MANAGING YOUR ENVIRONMENT
Networking. File Shares. Data Import Security. Server Management. Active Directory. Certificates.

05 DAYS
UPSHELLA

21 - 25 October 2024
2 - 6 December 2024
3 - 7 February 2025
24 - 28 March 2025

LEARNING GOALS
This course will get you acquainted with all the different features of PowerShell. You will learn how to automate and script administration, configuration and deployment of on-prem servers and cloud environments with out-of-the-box cmdlets and custom scripts.

TARGET AUDIENCE
System Administrators or System Engineers who are responsible for the management and configuration of Microsoft Servers, Microsoft Cloud Infrastructure or Microsoft applications.

MASTERING POWERSHELL

POWERSHELL OVERVIEW
PowerShell Overview. Brushing up on objects. PowerShell Versions. Windows PowerShell versus PowerShell Core. Concepts and Terminology. Getting Commands. Getting Help. Providers and Drives.

POWERSHELL SHELLS
PowerShell Console. Integrated Scripting Environment (ISE). Visual Studio Code.

CORE CONCEPTS
Viewing Object Structure. Object Pipeline. Using Format Cmdlets to Change Output. Export Data with Out Cmdlets. Using Variables to Store Objects.

OBJECT PIPELINE PROCESSING
Where-Object. Foreach-Object. Select-Object. Sort-Object. Measure-Object. Compare-Object. Group-Object. Tee-Object.

WORKING WITH OBJECTS
Files and Folders. Registry Keys and Values. COM Objects. WMI Objects - CIMCmdlets. .NET Objects. Static Classes.

EXTENDING POWERSHELL FUNCTIONALITY
Modules. Package Manager. PowerShell Gallery. PowerShell Profiles. Operators and Expressions.

POWERSHELL SECURITY
PowerShell Execution Policy. Script Signing. Security Sensitive Information in Scripts.

POWERSHELL REMOTING
PowerShell Remoting Overview. WS-Management (WSMAN). Remote CIM Sessions. Import/Export Remote Sessions. WinRM

Security. WinRM Double Hop Problem. Using Variables in Remoting Sessions. Remoting with PowerShell Core.

MANAGING YOUR ENVIRONMENT
Networking. File Shares. Data Import Security. Server Management. Active Directory. Certificates.

POWERSHELL JOBS
Background Jobs. Remoting Jobs. Scheduled Jobs.

ERROR HANDLING
Debugging options. Error Handling. Trap Statement. Try - Catch Statement.

DEVOPS: DESIRED STATE CONFIGURATION
Desired State Configuration Overview. DSC Components: Configuration - Node - Resource. Apply DSC Configurations. Push versus Pull Mode. Azure Automation DSC.

POWERSHELL SCRIPTING STATEMENTS
Foreach. For. While – do while – do until. If - Switch. Break - Continue.

ADVANCED SCRIPTING
Functions. Script Basics. Advanced Functions. Advanced Parameter Configuration. Command Documentation. Creating a PowerShell Module. Creating your own Cmdlets.

JEA: JUST ENOUGH ADMINISTRATION
JEA Overview. Role Capabilities. Session Configurations. Register JEA Endpoint. Auditing and Reporting.

POWERSHELL ON LINUX
Install PowerShell Core on Linux. Manage Linux Systems. Manag

MASTERING MICROSOFT GRAPH POWERSHELL

02
DAYS
UPSHELLG

MICROSOFT GRAPH OVERVIEW
Microsoft Graph Overview. Microsoft Graph Benefits. Graph Explorer. Graph X-Ray.

MICROSOFT GRAPH POWERSHELL
Microsoft Graph PowerShell Overview. Install Microsoft Graph PowerShell. Microsoft Graph Permissions and Authentication. Microsoft Graph Find Commands. Microsoft Graph Queries. Limitations of Microsoft Graph PowerShell.

MICROSOFT ENTRA ID
Create and Manage Users. Create and Manage Groups. Create Dynamic Groups. Assign Roles to Users and Groups. Assign Licenses to Users and Groups. View Sign In Events for Users.

MICROSOFT INTUNE
Device Configuration. Compliance Policies. App Configuration Policies. Device Reporting.

MICROSOFT 365 SERVICES
Exchange Online: Manage Mailboxes, Send Email, Get Mailbox Statistics. SharePoint Online: Manage Sites, Get Site Activity Information, List Permissions. Teams: Create Teams and Channels, Manage Team Members, Send Chat Message.

MICROSOFT GRAPH AUTHENTICATION OPTIONS
Create an Entra ID App Registration. Authentication with Client Secret. Authentication with Certificate. Managed Identities. Automation Account with Managed Identity.

3 - 4 October 2024
12 - 13 December 2024
27 - 28 February 2025

LEARNING GOALS
In this intensive 2-day course, participants will dive into the powerful capabilities of Microsoft Graph PowerShell, designed to streamline and automate administrative tasks within the Microsoft 365 ecosystem.

TARGET AUDIENCE
This course is intended for System Administrators or System Engineers. If you have little or no knowledge of the basics of PowerShell, U2U recommends taking the 3-day Scripting with PowerShell first.

ADMINISTERING WINDOWS SERVER HYBRID CORE INFRASTRUCTURE

05
DAYS
AZ-800

IDENTITY SERVICES IN WINDOWS SERVER
Introduction to AD DS. Manage AD DS Domain Controllers and FSMO Roles. Implement Group Policy Objects. Manage Trust Relationships. Monitor and Troubleshoot AD DS.

IMPLEMENTING IDENTITY IN HYBRID SCENARIOS
Install and Configure Directory Synchronization with Azure Active. Directory Connect. Implement Seamless Single Sign-On. Azure Active Directory Domain Services. Deploy VMs as Active Directory Domain Controllers in Azure.

WINDOWS SERVER ADMINISTRATION
Perform Windows Server Secure Administration. Windows Server Administration Tools: Windows Admin Center, Server Manager and PowerShell. Configure Windows Server Core Installations. Just Enough Administration in Windows Server (JEA).

FACILITATING HYBRID MANAGEMENT
Administer and Manage Azure VMs remotely. Manage VMs with Azure Bastion. Configure Just-in-Time Administration. Manage Hybrid Workloads with Azure Arc.

HYPER-V VIRTUALIZATION IN WINDOWS SERVER
Deploy and Configure a Hyper-V Server. Create and Manage Hyper-V Virtual Machines. Secure Hyper-V Workloads with Shielded VMs. Run Docker Containers on Windows Server. Orchestrate Containers on Windows Server using Kubernetes. Deploy and Configure Azure VMs.

DEPLOY AND CONFIGURE AZURE VMS
Deploy Azure Virtual Machines. Customize Azure VM Images. Automate the Configuration of Azure VMs. Implement Azure Automation with DSC.

NETWORK INFRASTRUCTURE SERVICES IN WINDOWS SERVER
Deploy and Manage DHCP. Implement Windows Server DNS. Implement IP Address Management. Implement Remote Access.

IMPLEMENT HYBRID NETWORK INFRASTRUCTURE
Azure Network Topologies. Connect Azure and On-Prem Networks: VPN Gateway and ExpressRoute. Name Resolution in Azure. Implement Azure VM IP Addressing and Routing.

FILE SERVERS AND STORAGE MANAGEMENT IN WINDOWS SERVER
Manage Windows Server File Servers. Implement Storage Spaces and Storage Spaces Direct. Implement Data Deduplication. Implement iSCSI Storage. Implement Storage Replica.

IMPLEMENT A HYBRID FILE SERVER INFRASTRUCTURE
Azure File Services. Configure Connectivity to Azure Files. Implement Azure File Sync. Migrate from DFSR to Azure File Sync.

4 - 8 November 2024
10 - 14 February 2025
14 - 18 April 2025

LEARNING GOALS
In this course, students will learn to manage Windows Servers, both on-premises and in Azure. They will also learn how to integrate Windows Server environments with Azure services in a hybrid deployment.

TARGET AUDIENCE
This course is intended for IT Professionals responsible for the management of Windows Servers hosted on-premises and in Microsoft Azure.

03 DAYS
UBIPBE

7 - 9 October 2024
25 - 27 November 2024
27 - 29 January 2025
17 - 19 March 2025
28 - 30 April 2025

LEARNING GOALS
This course covers all important aspects of Power BI. You learn how to connect to any data source using Power Query. The next step is enhancing the data model by using relationships, hierarchies, calculated columns, and measures. When the model is finished, you will build an interactive report and maintain & share it in the Power BI Service.

TARGET AUDIENCE
This course is intended for business users with no or little knowledge of Power BI. No technical or IT background is required.

ANALYZING YOUR DATA WITH POWER BI FOR BUSINESS USERS

INTRODUCTION TO POWER BI
The need for Business Intelligence. Self-Service BI versus Enterprise BI. Core concepts of Power BI. Introducing Power BI Desktop. Introducing the Power BI Service.

LOADING DATA WITH POWER BI DESKTOP
Core Concepts of Power Query. Loading data from Excel, Web, Databases... Applying Basic Transformations. Loading data via DirectQuery.

ENHANCING A DATA MODEL IN POWER BI DESKTOP
Renaming & Hiding Columns and Tables. Column Data Types and Formatting. Working with Numerical Columns. Sorting Columns. Data Categorization. Creating Hierarchies inside Tables. Defining Calculated Columns and Measures using DAX. Creating Measures using Microsoft coPilot. Working with Quick Measures. Defining Relationships between Tables.

DESIGNING REPORTS IN POWER BI DESKTOP
Overview of the Report Canvas. Adding Text Boxes, Shapes and Images. Using Built-in Visualizations. Custom Theming. Printing a Power BI Report. Power BI Templates.

ENHANCING REPORTS IN POWER BI DESKTOP
Slicers and Filters. Drill Through Pages. Custom Tooltips. Bookmarks. Visual Hierarchies and Drill-down Behavior. Grouping and Binning. Dynamic Behavior with Parameters. Custom Visuals. Report Mobile Design.

INTRODUCTION TO POWER BI SERVICE
Power BI Service Overview. Microsoft Fabric Introduction. Power BI Service Tiers and Features. Working with Semantic Models and Reports. Creating and using Workspaces.

CREATING SEMANTIC MODELS AND REPORTS IN POWER BI SERVICE
Creating Semantic Models in the Power BI Service. Connecting to Semantic Models in Power BI Desktop. Semantic Model Configuration and Permissions. Creating Reports in the Power BI Service. Configuring and Exporting Reports.

CREATING DASHBOARDS AND ANALYZING DATA WITH POWER BI SERVICE
Creating and Configuring Dashboards. Working with Power BI Q&A. Analyze Semantic Models in Excel. Metrics and Scorecards for KPI tracking.

SHARING CONTENT IN THE POWER BI SERVICE
Sharing Reports and Dashboards with internal and external users. Sharing content inside a Workspace. Creating & Consuming Power BI Apps. Publishing Reports to the web. Subscribing to Reports. Embedding Reports in SharePoint Online or Microsoft Teams. Report Usage Metrics.

USING POWER BI WITH MOBILE DEVICES
Supported Platforms. Accessing Reports, Dashboards and Semantic Models from Mobile Devices.

05 DAYS
UBIPB

21 - 25 October 2024
9 - 13 December 2024
10 - 14 February 2025
31 March - 4 April 2025

LEARNING GOALS
This course will teach you all aspects of connecting to data sources and transforming data using Power Query, creating Power BI data models and reports, and publishing and maintaining them on the Power BI Service. The course also covers more technical topics on Power Query and DAX. Additionally, it explains how to configure a Data Gateway to connect the Power BI service to your on-premises data sources and how row-level security can be used to secure data models.

TARGET AUDIENCE
This course is intended for technical people who have a background in Business Intelligence.

ANALYZING YOUR DATA WITH POWER BI FOR BI PROFESSIONALS

INTRODUCTION TO POWER BI
The need for Business Intelligence. Self-Service BI versus Enterprise BI. Power BI Core Concepts. Introducing Power BI Desktop. Introducing the Power BI Service. Power BI Service Tiers and Features.

CREATING QUERIES USING POWER BI DESKTOP
Creating Power Queries and working with Query Steps. Loading Data from CSV, Excel, Web, Folders... Loading Data from Relational Databases. Applying Basic Transformations. Performance Tuning via Query Folding. Loading Data via DirectQuery.

WRITING ADVANCED QUERIES IN POWER BI DESKTOP
Advanced Transformations in Power Query. Appending and Merging Queries. Working with Query Parameters. Defining and using Query Functions. Managing Data Source Security.

BUILDING A SEMANTIC MODEL
The need for a Semantic Model. Authoring Semantic Models in Power BI Desktop. Column Data Types and Formatting. Sorting Columns. Data Categorization. Creating Hierarchies inside tables. Semantic Model Storage Cost. Analyzing storage costs using DAX Studio.

RELATIONSHIPS
Cardinality of Relationships. Relationship Limitations. Role-playing Dimensions. The Cross-Filter direction of Relationships.

SEMANTIC MODELS STORAGE MODES
Import Mode. DirectQuery Mode. Dual Mode. Live Connection. Aggregation Tables.

DATA ANALYSIS EXPRESSIONS (DAX)
DAX introduction. Creating Calculated Columns. Creating Tables. Creating Measures. Creating Measures using Microsoft CoPilot. CALCULATE-Function. Time-Intelligence Functions.

DESIGNING REPORTS IN POWER BI DESKTOP
Overview of the Report Canvas. Adding Text Boxes, Shapes and Images. Using built-in Visualizations. Custom Theming. Printing a Power BI Report. Power BI Templates.

ENHANCING REPORTS IN POWER BI DESKTOP
Slicers and Filters. Drill Through Pages. Custom Tooltips Bookmarks. Visual Hierarchies and Drill-down Behaviour Grouping and Binning. Dynamic Behaviour with Parameters Custom Visuals. Report Mobile Design.

INTRODUCTION TO POWER BI SERVICE
Power BI Service Overview. Microsoft Fabric Introduction. Power BI Service Tiers and Features. Working with Semantic Models and Reports. Creating and using Workspaces.

CREATING SEMANTIC MODELS AND REPORTS IN POWER BI SERVICE
Creating Semantic Models in the Power BI Service. Connecting to Semantic Models in Power BI Desktop. Semantic Model Configuration and Permissions. Creating Reports in the Power BI Service. Configuring and Exporting Reports.

CREATING DASHBOARDS AND ANALYZING DATA WITH POWER BI SERVICE
Creating & Configuring Dashboards. Working with Power BI Q&A. Analyze Semantic Models in Excel. Metrics and Scorecards for KPI tracking.

SHARING CONTENT IN THE POWER BI SERVICE
Sharing Reports and Dashboards with internal and external users. Sharing content inside a Workspace. Creating & Consuming Power BI Apps. Publishing Reports to the web. Subscribing to Reports. Embedding Reports in SharePoint Online or Microsoft Teams. Report Usage Metrics.

MANAGING DATA REFRESH IN POWER BI
Scheduling Semantic Model Refreshes. Online vs. on-prem Data Sources. The need for a Data Gateway. Configuring a Data Gateway. Incremental Refresh.

SECURING A DATA MODEL
Enhancing a Data Model with Row Level Security. Configuring Row Level Security. Implementing Dynamic Security. Security and Relationships.

MASTERING DAX

03 DAYS
UDAX

AN INTRODUCTION TO DAX
DAX use cases. Understanding calculated columns and measures. Building tables with DAX. DAX as a query language. DAX for row level security. DAX patterns.

DAX STUDIO
Introducing DAX Studio. Installing DAX Studio. Writing DAX queries: EVALUATE, ORDER BY and START AT. Constructing tables with FILTER, DISTINCT, ROW, SELECTCOLUMNS and SUMMARIZECOLUMNS. Who's eating up the resources: Querying meta-data. Power BI DAX Query View. Profiling DAX queries.

DAX EXPRESSIONS
DAX data types. Getting started with constants. Mathematical, boolean and string operators. The most important scalar functions in DAX.

CREATING DAX MEASURES
Introduction to evaluation context. The CALCULATE function and the row and filter context. Aggregation functions. Defining table scopes. Using ALL and VALUES.

USING CALCULATE FOR TIME INTELLIGENCE
Creating calendar tables using CALENDAR and CALENDARAUTO.

Working with multiple data tables. Mark as Data Table. Computing YTD/QTD and MTD totals. Comparing data over time using DAX. Calculating Rolling Totals. Calculating Moving Averages.

WORKING WITH CALCULATION GROUPS
The need for calculation groups. Creating calculation groups. Format strings in calculation groups. Excluding measures from calculation items.

MORE ON MEASURES: ITERATORS
SUMX aggregation function. Linking to different tables with RELATED. More iterators: RANKX, CONCATENATEX, ... Using variables in DAX. Context transition.

INSPECTING AND CONTROLLING THE EXECUTION CONTEXT
Why do we need the context? HASONEVALUE. ISFILTERED. ISCROSSFILTERED. ISINSCOPE. SELECTEDVALUE. ALLSELECTED. Handling hierarchies in DAX. Calculate ratio's to a parent subtotals. Raising errors in DAX. Using DAX in Visual Calculations .

ADVANCED DAX CONSTRUCTS
CALCULATE modifiers USERELATIONSHIP, CROSSFILTER, ... Expanded tables. TREATAS, CALCULATETABLE. Windowing functions: OFFSET, INDEX and WINDOW.

12 - 14 November 2024
16 - 18 December 2024
17 - 19 February 2025
22 - 24 April 2025

LEARNING GOALS
In this course you will learn how to use DAX to create calculated columns and measures and how you can use DAX as a query language.

TARGET AUDIENCE
This course is intended for people who have already built data models in Power BI.

DESIGNING DATA MODELS FOR POWER BI

02 DAYS
UPBIDM

THE NEED FOR DATA MODELING
Data model definitions and terminology. Advantages and disadvantages of normalizing data. Issues when reporting on operational databases. Differences between data warehouse, data flow, and data set. Data model advantages. Conducting user interviews. Prioritizing the requirements. Documenting the requirements.

MODELING DIMENSIONAL TABLES
Introducing dimensional modeling. The need for dimension tables. Properties of dimension tables. Surrogate keys. Star versus snowflake dimensions.

MODELING FACTUAL TABLES
Properties of Fact tables. Additive, Semi-additive and none-additive measures. Transactional Fact Table. Snapshot Fact Table. Accumulating Snapshot Fact Table. Inspecting the size of the fact tables in Power BI.

DESIGNING THE DATE DIMENSION
Why do we need a date dimension. The danger of the auto-generated date tables in Power BI. Designing the date dimension. Working with Time. Multiple time zones. Useful tools and scripts.

WORKING WITH SLOWLY CHANGING DIMENSIONS (SCD)
Why do we need Slowly Changing Dimensions. Type I, II and III slowly changing dimensions. Designing for SCD. Advanced SCD types.

ADVANCED DIMENSIONAL MODELING
Early arriving facts. Late arriving facts. Dealing with currency conversion. Dealing with hierarchies. Role playing dimensions. Modeling many to many relations.

PHYSICAL DATA MODEL DESIGN
Staging tables In Power Query. Impact of modeling on model size. Data Flows. Aggregation tables. Aggregations in Semantic models. Semantic model deployment using PowerShell

17 - 18 October 2024
12 - 13 December 2024
6 - 7 February 2025
10 - 11 April 2025

LEARNING GOALS
In this training you will learn how to design models according to the popular modeling techniques using Star and Snowflake schemas.

TARGET AUDIENCE
The course assumes participants are already familiar with Power BI Desktop and DAX.

03 DAYS
UPBIM

12 - 14 November 2024
13 - 15 January 2025
24 - 26 March 2025

LEARNING GOALS
This course shows you how to manage Power BI in an enterprise environment. It focusses on the challenges that might appear: How to do versioning, check data lineage, deploy large Semantic Models, setup security...

TARGET AUDIENCE
BI and IT professionals responsible for an enterprise deployment and management of Power BI solutions.

MANAGING A POWER BI ENVIRONMENT

CONFIGURING WORKSPACES
Creating workspaces. Set a Workspace OneDrive. Shared versus dedicated capacity. Workspace connectivity with the XMLA endpoint. Configuring Azure Data Lake Gen 2 integration. Automating Workspace creation using PowerShell. Creating and working with Service principals. Governance.

MANAGING SEMANTIC MODELS
Working with Semantic Models in the Power BI Service. Power BI Projects and source control. Tabular Model Definition Language (TMDL). Using Visual Studio Code. Git Integration in the Power BI Service. Creating semantical models in Visual Studio. Adjusting and deploying semantical models with Tabular Editor Versioning and deploying using ALM Toolkit

DEPLOYING CONTENT USING DEPLOYMENT PIPELINES
The need for different workspaces. Using Deployment Pipelines.

CONFIGURING WORKSPACE SECURITY
Configuring Workspace security. Security when sharing Dashboards and Reports. Securing data at rest. Securing data in transit.

REFRESHING DATASETS
Data Gateways. Standard versus Personal mode. Import versus DirectQuery versus live connections. Configuring Data Refresh Credentials. Monitoring Gateways and data refresh. Configuring incremental refresh. Incremental refreshes and partitioning. Dataset refresh using the XMLA endpoint.

WORKING WITH DATAFLOWS
What are Dataflows? Dataflows, Entities and the Common Data Model (CDM). Dataflows and Azure Data Lake Gen 2 storage. Creating Dataflows. Working with linked and computed Entities. Scheduling refreshes for Dataflows. Using Dataflows in Power BI Desktop. Dataflow licensing.

ADMINISTERING A POWER BI TENANT
Configuring tenant settings. Sharing settings. Custom visuals settings. Managing custom data sources.

MONITORING POWER BI
Monitor Power BI via reports. Monitoring workspace usage. Customizing workspace usage reporting. Power BI Premium Capacity Metrics and Alerts. Integrated Unified Office 365 Audit Logging.

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02 DAYS
UPBIPR

12 - 13 December 2024
13 - 14 February 2025
22 - 23 April 2025

LEARNING GOALS
Power BI Paginated Reports are an alternative way to build reports. Although they are less interactive than regular Power BI reports, they are more convenient to build reports that need to be printed, or exported to a wide variety of formats. In this course you will learn how to create new paginated reports with the Power BI Report Builder tool, using both semantic models as well as embedded data sources. Also the deployment of reports to the Power BI services is covered, as well as migration from SQL Server Reporting Services (SSRS) to Power BI Paginated Reports.

TARGET AUDIENCE
This course is intended for people who need to create paginated reports in Power BI. Students should be familiar with the Power BI Service (portal, workspaces, semantic models).

CREATING POWER BI PAGINATED REPORTS

INTRODUCTION TO POWER BI PAGINATED REPORTS
Overview of Power BI Reporting Options. Limitations of regular Power BI Reports. Building Paginated Reports in the Browser.

WORKING WITH POWER BI REPORT BUILDER
Installing the Power BI Report Builder. Exploring the Report Builder Features. Working with the Report Builder Wizards. Editing an existing Paginated Report. Inspecting the .rdl File Format. Creating a basic Table Report. Referencing Fields in Textbox. Working with built-in Fields. Aggregations and Calculations. Working with Groupings. Formatting Pages.

BRING DATA IN YOUR REPORTS
Connecting to Semantic Models. Using Power Query to setup embedded Data Sets. Using Parameters and Filters. Using Parameter Lists. Multi-select Parameters. Lookup Functions.

ADVANCED REPORT COMPONENTS
Interactive Navigation (drill-through). Displaying Data with collapsible Regions. Interactive Column sorting. Creating a Table of Contents with Document Maps. TextBoxes and Placeholders. Recursive Parents. TABLe, LIst and matrIX combined: Tablix. Repeating Visuals in a List. Using Subreports.

ADDING CHARTS TO YOUR REPORTS
Using Charts. Advanced Charting and Sparklines. Plotting Data on Maps. Visualizing KPIs with indicators and Gauges. Specifying Chart Colors with Palettes.

DEPLOYMENT AND MIGRATION
Publish a Paginated Report to the Power BI Service. Uploading .rdl Files in a Power BI Workspace. Migrating from SQL Server Reporting Services to Power BI

MICROSOFT POWER APPS AND POWER AUTOMATE

04 DAYS
UPOWER

28 - 31 October 2024
16 - 19 December 2024
3 - 6 February 2025
24 - 27 March 2025

INTRODUCTION TO THE POWER PLATFORM
Overview of the Microsoft Power Platform. Power Apps, Power Automate, Power BI, Copilot Studio & Power Pages. Microsoft Dataverse. Real world use case of the Power Platform.

POWER PLATFORM LICENSING GUIDE
Licensing Overview. Included Features by License Type. Connectors and Connections Overview. Standard vs Premium connectors. Extra Add-ons.

INTRODUCTION TO POWER APPS
What is Power Apps? What are environments? Canvas Apps vs. Model-Driven Apps vs. Power Apps Portals. Getting started with Canvas Apps using templates. Power Apps on mobile.

BUILDING CANVAS APPS
Power Apps Studio. Creating Canvas Apps with Microsoft Copilot. Data and API Connections. Creating Canvas Apps from Data Connection vs. from Scratch. Screens & Controls. Galleries. Forms. The Power FX Formula Language.

WORKING WITH FORMS IN CANVAS APPS
Customizing Edit and Detail Forms. Saving Form Data to a Data Source. Data Cards. Data Card Customizations. Input validation. Hidden Data Cards.

DATA SOURCES AND LOCAL DATA IN CANVAS APPS
Variables and Collections. Data Source Configuration, Operations & Manipulations. Handling and Preventing Errors
Data Source Search, Sort & Refresh. Data Source Delegation.

CONFIGURING AND PUBLISHING CANVAS APPS
Canvas Apps Configuration. Canvas App Responsiveness
Saving, Sharing and Publishing Apps. Sharing and Permissions. Embed a Canvas App in a SharePoint Page & Microsoft Teams. Canvas App Analytics & Monitoring.

INTRODUCTION TO POWER AUTOMATE
Power Automate Overview. Power Automate Building Blocks. Using Connections in Flows. The Power Automate Mobile App.

BUILDING BASIC FLOWS
Building Flows from Scratch. Automated, Instant & Scheduled Flows. Building Flows with Microsoft Copilot. Flow Actions & Connections. Flow Conditions and Dynamic Content. Monitoring Flows. Microsoft 365 Integration.

POPULAR CONNECTIONS AND ACTIONS
List Data and Document Management in SharePoint. File management in OneDrive. File manipulation in Word and Excel. User and Group Manipulation in Office 365 and Azure AD. Data Management in Relational Databases.

MODERN APPROVALS WITH POWER AUTOMATE
Configuring Approvals with Power Automate. Approval Settings. Approving and Rejecting Approvals. Processing the Approval Outcome.

POWER AUTOMATE PATTERNS
Advanced Trigger and Action Configurations. HTTP Actions to call APIs or other Flows. Variables, Collections and Data operations. Conditions, Parallelism and Loops. Error Handling. Limitations.

WORKFLOW DEFINITION LANGUAGE
Introduction to WorkFlow Definition Language. Expressions, Operators and Functions. Using Expressions in Flows.

FLOW PERMISSIONS & SHARING
Sharing a Flow. Co-Ownership. Flow Permissions. Shared Flow Connections & Credentials. Run only users and Connections.

SHAREPOINT FORM CUSTOMIZATION
Customizing a SharePoint form. SharePoint Integration Control. Differentiate your form based on the mode: view, edit, new. Adding Behaviour with Controls. Wide screen SharePoint forms.

POWER PLATFORM INTEGRATIONS
Bundling Apps and Flows in Solutions. Trigger a Flow from a Canvas App. Open a Canvas App from a Flow Notification. Power BI & Copilot Studio Integrations.

LEARNING GOALS
Microsoft Power Apps and Microsoft Power Automate are integral components of Microsoft's Power Platform, enabling citizen developers to create robust applications and automations using a low-code approach. Power Apps empowers us to construct interactive mobile applications, while Power Automate facilitates the automation of business processes including approvals, synchronization, and more. Throughout this course, you will acquire the skills to construct Power Apps Canvas Apps and implement Power Automate processes that integrate seamlessly with your data.

TARGET AUDIENCE
This course targets power users, content managers, business analysts and many more. No prior knowledge to Power Apps or Power Automate is required.

POWER APPS AND POWER AUTOMATE: ADVANCED PATTERNS

03 DAYS
UPPA

12 - 14 November 2024
13 - 15 January 2025
17 - 19 March 2025

CREATING RESPONSIVE CANVAS APPS
What is a responsive app? Working with responsive layout containers. Configuring auto-layout containers. Working with screen sizes and breakpoints.

WORKING WITH COMPONENTS IN CANVAS APPS
Creating Components and Component Libraries. Defining Inputs and Outputs. Using Components. Canvas Component Properties. Component library ALM. Behavior Formulas for Components.

CREATING CUSTOM CONNECTORS FOR THE POWER PLATFORM
Create a custom connector using the Connector Wizard. Using Custom Connectors. Create Custom Connectors in solutions. Environment variables in Solution Custom Connectors.

STORING DATA USING MICROSOFT DATAVERSE
Using Microsoft Dataverse as a data source. Creating Tables in Microsoft Dataverse. Creating Columns, Relationships and Views in a Table.

USING MICROSOFT DATAVERSE IN CANVAS APPS AND POWER AUTOMATE
Using Microsoft Dataverse in a Canvas App. Using Microsoft Dataverse in Power Automate.

WORKING WITH LOW-CODE PLUG-INS
What are Low-Code Plug-Ins? Creating Low-Code Plug-Ins using Power Fx. Instant vs Automated Plug-Ins. Connect external data to Plug-Ins. Using Low-Code Plug-Ins in Canvas Apps. Using plug-ins in Power Automate.

MONITORING AND DEBUGGING POWER APPS
Error handling and notifications in Canvas Apps. Integration with Azure Application Insights. Debugging Canvas Apps with the built-in Monitor.

TESTING POWER APPS
Canvas App Test Studio Overview. Creating and running Test Cases. Working with Test Suits. Processing Test Results. Best Practices and Limitations.

LEARNING GOALS
This training will take you from being an average Power Apps maker to a great one. You'll explore more advanced techniques like Responsive Apps, Components and Custom Connectors. You will get acquainted with Plug-ins and the integration options with Microsoft Dataverse.

TARGET AUDIENCE
This course is targeted at Power Platform makers who already have a solid understanding of creating Canvas apps and Power Automate Flows.

03 DAYS
UPPG

28 - 30 October 2024
20 - 22 January 2025
24 - 26 March 2025

LEARNING GOALS
ALM is the lifecycle management of applications, which includes governance, development, and maintenance. In this course, you will learn how to use the Power Platform features and tools available to manage ALM. By the end of the course, participants will be equipped with a comprehensive skill set for successful development, deployment, and operation of a Power Platform environment.

TARGET AUDIENCE
This course is targeted at Power Platform makers and administrators who are interested in managing and deploying Power Apps and Flows in a corporate environment. Participants should have a basic understanding of Power Apps and Power Automate.

POWER PLATFORM ALM AND GOVERNANCE STRATEGIES

WORKING WITH ENVIRONMENTS IN THE POWER PLATFORM
Overview of the Power Platform. The Role of Environments in the Power Platform. Creating and Managing Environments. Environments and Security. The Default Environment.

WORKING WITH SOLUTIONS IN THE POWER PLATFORM
Working with Solutions in Environments. Default Solutions in an Environment. Creating Solutions and Solution Publishers. Creating Canvas apps and Power Automate Flows inside a Solution. Importing and Exporting Solutions. Managed versus Unmanaged Solutions. Solutions and Managed Properties.

WORKING WITH CONNECTION REFERENCES AND ENVIRONMENT VARIABLES
Introducing Connection References. Connection References in Power Automate Cloud Flows. Connection References in Canvas Apps. Manually creating Connection References in Solutions. Importing Solutions with Connection References. Connection References Gotchas.

APPLICATION LIFECYCLE MANAGEMENT (ALM) WITH THE MICROSOFT POWER PLATFORM CLI
The Microsoft Power Platform CLI. Application Lifecycle Management with the Power Platform CLI. Editing a Canvas app using Power FX and Visual Studio Code. Managing Environment variables and Connection References with the Power Platform CLI.

WORKING WITH SERVICE PRINCIPALS IN THE POWER PLATFORM
Which artifacts are actually user-owned? What are Service Principals?.Creating and configuring a Microsoft Entra ID application registration. Using Service Principals in Canvas Apps and Power Automate Flows. Working with Service Principals in the Power Platform CLI.

WORKING WITH PIPELINES IN THE POWER PLATFORM
What are Pipelines?. Setup Pipelines. Run Pipelines. Extend Pipelines. Lightweight Pipelines.

WORKING WITH ON-PREMISES DATA SOURCES
Online vs. On-Premises Data Sources. Installing and configuring a Data Gateways. Using a Data Gateways in Canvas Apps and Power Automate.

WORKING WITH THE CENTER OF EXCELLENCE TOOLKIT
Setup the Center of Excellence Toolkit. What's in the Center of Excellence Toolkit? Using the Center of Excellence Toolkit.

03 DAYS
UPAP

27 - 29 January 2025
7 - 9 April 2025

LEARNING GOALS
This training will teach low-code makers and developers how to create external-facing business websites using Power Pages. With Power Pages, you can quickly build web sites by using the same shared business data stored in Microsoft Dataverse that you use for building apps and workflows.

TARGET AUDIENCE
Students will need to have a basic understanding of HTML, the Power Platform and Microsoft Dataverse.

CREATE LOW-CODE BUSINESS WEBSITES WITH MICROSOFT POWER PAGES

INTRODUCTION TO POWER PAGES
Overview of the Power Platform. Introducing Microsoft Dataverse. Using the Power Platform Admin Center. Using the Power Apps Maker Portal. Creating a site from blank. Creating a site from a template. Power Pages licensing. Power Pages and Dynamics 365. Introducing the Power Platform CLI.

GETTING STARTED WITH POWER PAGES
Overview of a Power Pages site. Lifecycle of a Power Pages site. Understanding Power Pages design studio. Authoring basic content in Power Pages design studio. Overview of the Portal Management app. Managing a Power Pages site in the Portal Management app. Configuring Power Pages settings. Browsing and editing a Power Pages site. Deleting a Power Pages site. XrmToolBox and Power Pages. The Enhanced vs Standard Data Model.

CREATE AND DESIGN A POWER PAGES SITE
Creating Web Pages. Adding Sections. Adding text, images, breadcrumbs, custom menus, ... Working with Templates. working with Themes and CSS. Using the code editor. Configuring the site Navigation.

DEEP DIVE INTO WEB PAGES
Root and Content Pages. Introduction to Liquid. Working with Liquid objects, tags and filters. Creating custom Page Layouts. Working with Page and Web Templates. Using JavaScript inside Web Pages. Authoring Power Pages content in XrmToolBox.

AUTHORING ADVANCED POWER PAGES CONTENT
Creating Web Files. Working with Web Links and Web Link Sets. Configuring Content Snippets. Using Site Markers. Working with Redirects and Shortcuts. Authoring content in Visual Studio Code using the Power Platform CLI.

POWER PAGES SITES AND ALM
Overview of ALM with Power Pages sites. Exporting site content from a development environment. Importing site content in a acceptance/production environment.

CONFIGURING AUTHENTICATION IN A POWER PAGES SITE
Power Pages authentication overview. Configure Power Pages authentication with Azure AD, Azure B2C... Configure contacts. Invite contacts.

CONFIGURING AUTHORIZATION IN A POWER PAGES SITE
Creating and using Web Roles. Configure Table permissions. Manage Web Page Access Control Rules. Create website access permissions.

POWER PAGES AND MICROSOFT DATAVERSE
Working with Lists. Configuring advanced List properties and Metadata. Creating and using Basic Forms. Configuring Basic Form properties and metadata. Creating and using Multistep Forms. Retrieving and displaying Dataverse data with Liquid and FetchXML.

MODEL-DRIVEN APPS WITH MICROSOFT DATAVERSE IN POWER APPS

05 DAYS
UCDS

INTRODUCTION TO THE MICROSOFT POWER PLATFORM
The past: Dynamics CRM. Overview of the Microsoft Power Platform. Introduction to Microsoft Dataverse. The Common Data Model. Dynamics 365 Sales, Customer Services, ... as model-driven apps on Microsoft Dataverse.

OVERVIEW OF MODEL-DRIVEN APPS/DYNAMICS 365
Creating and working with environments. The relationship between environments and Microsoft Dataverse. Navigating and using a model-driven app.

WORKING WITH SOLUTIONS
Customizing Model-Driven Apps. Publishers and Solutions. Managed and Unmanaged Solutions. Adding components. Managed properties. Importing and Exporting Solutions. Versioning solutions.

CREATING MODEL-DRIVEN APPS
Concepts of a model-driven app. The structure of a Site Map. Creating a Site Map for an app. Creating apps with the App Designer. Navigating between apps. Managing apps in Solutions. Preview: the modern app designer. Introducing XrmToolBox.

CREATING AND CUSTOMIZING TABLES
Creating and configuring tables in Microsoft Dataverse. The default table columns. Creating custom Activity Tables.

MANAGING RELATIONSHIPS
Plan, create, and configure Table Relationships. Creating and using relationships - 1:N, N:N. Connections and Connection Roles. Defining self-referential relationships. Defining hierarchy visualizations. Creating polymorphic or multi-table relationships.

CREATING AND CUSTOMIZING COLUMNS
Custom Columns. Column data types. File and Image data types. Lookup. Preview: creating multi-table or polymorphic Lookups. The Choice and Choices data types. Status and Status Reason columns Alternate Keys. Importing rows using Dataflows. Aggregating data with Rollup Columns. Calculated Columns. Creating Formula columns using PowerFX.

CUSTOMIZING FORMS
Define the structure. How to add, remove or modify the components using the Form Designer. Placing image column. Configure and use Quick Create, Quick View and Card Forms. Working with custom components. Embedding Canvas apps in a Form.

BUSINESS RULES
Create and apply Business Rules. Defining the scope of Business Rules. Business Rules limitations.

CREATING AND USING VIEWS
Different types of system, public and personal Views. Create and modify Views. Configure quick find, advanced find and associated Views. Configure views with custom controls like the Editable grid, calendar Control...

CREATING CUSTOM PAGES
Add a custom page to a model-driven app. Design considerations for custom pages. Use PowerFx in a custom page. Add connectors to a custom page.

REPORTING IN MODEL-DRIVEN APPS
Build Interactive Charts to show in Views or on Dashboards. Classic Dashboards showing Charts, Data or web pages. Interactive Dashboards with dynamic sorting and filtering. Working with the Tabular Data Stream (TDS) endpoint. Using Power BI Desktop with data stored in Microsoft Dataverse. Creating embedded Power BI Dashboards. Embedding a Power BI report in a Table Form.

SECURING MODEL-DRIVEN APPS
Building a Security Model. Business Units and their role in security modeling. Define Privileges and access levels in Security Roles. Creating and maintaining users. Team management.

POWER PLATFORM AUTOMATION
Overview. Trigger a Flow based on a create, update or delete of an table row. Consuming Microsoft Dataverse data inside Power Automate. Schedule a Flow. Modern Approval with Power Automate.

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21 - 25 October 2024
9 - 13 December 2024
3 - 7 February 2025
31 March - 4 April 2025

LEARNING GOALS
Built on the fundamentals of Dynamics 365, Model-Driven Apps allow you to build complex and sophisticated business apps without writing code. Model-driven apps follow a data-first approach. You first design the data model of your model-driven app using Microsoft Dataverse and then you compose the UI of the model-driven app. Unlike canvas app development where the designer has complete control over app layout, with model-driven apps much of the layout is determined for you and largely designated by the components you add to the app.

TARGET AUDIENCE
Power users, consultants and key business users.

DEVELOPING FOR THE POWER PLATFORM WITH MICROSOFT DATAVERSE

05 DAYS
UCDSD

EXTENSIBILITY OVERVIEW
Introduction to Dataverse. Overview of the Dataverse extensibility model. Overview of the Power Platform SDKs that are available from Microsoft via NuGet. Introducing XrmToolBox. Introducing the Power Platform CLI.

WORKING WITH THE DATAVERSE WEB API
Introduction to the Dataverse Web API. Registering client applications with Azure Active Directory. Authenticate with the Dataverse Web API using OAuth 2.0 and MSAL/ADAL. Performing a simple Create operation using the Dataverse Web API. Composing HTTP requests and error handling. Dataverse Web API URL and versions. The different HTTP methods and headers. Executing your first HTTP requests.

USING THE DATAVERSE WEB API
Query Data using the Dataverse Web API. Creating, Updating and Deleting rows in tables. Executing Actions and Functions. Impersonate another user using the Dataverse Web API. Detect duplicate data using the Dataverse Web API. Batch processing with the Dataverse Web API.

WORKING WITH THE DATAVERSE SERVICE CLIENT SDK
What is the Dataverse Service Client SDK. The IOrganizationService interface. Using the ServiceClient class to connect to Microsoft Dataverse. Use connection strings to connect to Microsoft Dataverse. Early versus late binding when accessing table rows. Generating entity classes using the Power Platform CLI. Create, update, delete and retrieve table rows using the ServiceClient. Querying Microsoft Dataverse using the QueryExpression and QueryByAttribute classes. Executing batches using ServiceClient.

QUERYING MICROSOFT DATAVERSE WITH FETCHXML
Introduction to FetchXML. Writing FetchXML queries. Using Xrm- ToolBox FetchXML Builder to create FetchXML queries. Executing FetchXML queries using the Dataverse Web API and the Dataverse Service Client SDK.

PLUG-INS
Plug-in overview. Writing custom plug-ins. Register and deploy plug-ins using the Plug-In Registration Tool. Debugging plug-ins in the Dataverse.

Deploying Plug-Ins with Solutions. Automate Plug-in deployment using Spkl. Using Plugin Trace Viewer in XrmToolBox.

AZURE INTEGRATIONS
Overview of the Azure integration with the Dataverse. Integration with Azure Service Bus. Configuring the Azure-aware OOB plug-in. Write a custom Azure-aware plug-in. Integration between the Dataverse and Web Hooks.

CREATING AND USING CUSTOM APIS AND ACTIONS
Introduction to the Microsoft Dataverse Event Framework. Executing messages via the Web API. Executing Functions and Actions using the Web API. Creating Custom Actions. Creating Custom APIs. Registering and testing Custom APIs using XrmToolBox. Using Custom APIs and Actions with the Web API. Using Custom APIs and Actions in Power Automate. Working with Business Events.

CLIENT SCRIPTING IN MODEL-DRIVEN APPS USING JAVASCRIPT
Creating JavaScript Web Resources. Handling Form/View and Field events. Root objects in the Client API object model. Working with the Client API execution context object. The Client API Form context object. Interacting with forms and attributes using the Client API object model. The Client API grid context object. The Client API Xrm object. Best practices in writing client-side Code.

CUSTOMIZING THE COMMAND BAR IN A MODEL-DRIVEN APP
Overview of the Command Bar. Available Command Bars in model-driven apps. Classic versus Modern Commanding. Working with Display and Enable rules. Creating a custom Ribbon Action. Pass data or URL parameters to a Ribbon Action. Adding or removing Commands in the Command Bar. Using Ribbon Workbench to customize the command bar. Modern Commanding using the Command Bar designer. Creating visibility rules using Power FX. Executing Power FX commands.

CREATING WEB RESOURCES
Web resources overview. Building custom HTML Web Resources. Using the Xrm.WebApi JavaScript object model to access, create and manage records.

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4 - 8 November 2024
13 - 17 January 2025
24 - 28 March 2025

LEARNING GOALS
Although Microsoft Dataverse and Model-driven apps have quite some out of the box customization options, many companies have requirements which can only be met by extending the existing feature set of Microsoft Dataverse. This course is specifically designed to help .NET and JavaScript developers learn the various development features of Microsoft Dataverse and Model-driven apps.

TARGET AUDIENCE
Basic understanding of C# and JavaScript is required. Working knowledge of Model-driven apps and the Power Platform is advised.

SQL SERVER

03 DAYS
UTSQL

18 - 20 November 2024
13 - 15 January 2025
10 - 12 March 2025
28 - 30 April 2025

LEARNING GOALS
The goal of this course is to provide students with the technical skills required to write basic Transact-SQL queries for Microsoft SQL Server. The course covers querying SQL Server 2022 or previous versions as well as Azure SQL Databases.

TARGET AUDIENCE
This course is intended for SQL Server database administrators and developers who are responsible for writing queries but have no or very limited experience in writing T-SQL SELECT statements.

QUERYING SQL SERVER WITH TRANSACT-SQL

INTRODUCTION TO TRANSACT-SQL AND THE QUERYING TOOLS
Tabular Data. Server-Client. SQL Server Object Hierarchy. Introduction to SQL Server Management Studio. Using the graphical query builder in Management Studio. Working with Azure Data Studio. Connecting to SQL Server from Excel or Power BI. A brief history of SQL Server.

SELECT FUNDAMENTALS
Basic SELECT Statement. T-SQL Expressions. Fetching Data from Tables. Filtering Data with the WHERE clause. Sorting Data. Combining Result Sets: UNION, EXCEPT and INTERSECT.

AGGREGATING DATA
Using Aggregation Functions. GROUP BY Fundamentals. Filtering on Groups Using the HAVING Clause. Computing Subtotals Using the ROLLUP and CUBE Clauses.

JOINING MULTIPLE TABLES
Database Normalization. Inner Join. Left, Right and Full Outer Join. Cross Join. Joining a table with itself. Creating Nested Queries.

DATATYPES
Text. Numerical Types. Date and Time. Type Precedence. Type Conversion.

MODIFYING DATA
Inserting Data. Updating Existing Records. Deleting Data. Intro Into Constraints. Understanding Transactions. Truncating a Table.

ADVANCED FUNCTIONS AND OPERATORS
T-SQL Functions. User-Defined Functions and Apply Operator. OVER Clause. Ranking Functions. Analytic Functions. PIVOT and UNPIVOT Operator.

SCRIPTING
T-SQL Scripts. Stored Procedures. Creating User-Defined Functions.

LEVELS OF ABSTRACTION
Common Table Expressions. Views. Levels of Abstraction.

05 DAYS
USQLD

4 - 8 November 2024
20 - 24 January 2025
10 - 14 March 2025

LEARNING GOALS
This five-day instructor-led course provides students with the knowledge and skills to develop a Microsoft SQL Server 2022 (or earlier) database, or databases on Azure SQL or Azure Managed Instances. The course focuses on teaching individuals how to use SQL Server product features and tools related to developing a database: logical table design, indexing and query plans.

TARGET AUDIENCE
The primary audience for this course is IT Professionals who want to become skilled on Azure SQL Databases, Azure Managed Instances or SQL Server 2022 (or earlier) product features and technologies for implementing a database.

DEVELOPING AND OPTIMIZING SQL SERVER DATABASES

INTRODUCTION TO DATABASE DEVELOPMENT
Introduction to the SQL Server Platform. SQL Server Database Development Tasks.

DESIGNING AND IMPLEMENTING TABLES
Designing Tables. Data Types. Working with Schemas. Creating and Altering Tables.

ADVANCED TABLE DESIGNS
Partitioning Data. Compressing Data. Temporal Tables.

ENSURING DATA INTEGRITY THROUGH CONSTRAINTS
Enforcing Data Integrity. Implementing Data Domain Integrity. Implementing Entity and Referential Integrity.

INTRODUCTION TO INDEXES
Core Indexing Concepts. Data Types and Indexes. Heaps, Clustered, and Nonclustered Indexes. Single Column and Composite Indexes.

DESIGNING OPTIMIZED INDEX STRATEGIES
Index Strategies. Managing Indexes. Execution Plans. The Database Engine Tuning Advisor. Query Store.

COLUMNSTORE INDEXES
Introduction to Columnstore Indexes. Creating Columnstore Indexes.

DESIGNING AND IMPLEMENTING VIEWS
Introduction to Views. Creating and Managing Views. Performance Considerations for Views.

DESIGNING AND IMPLEMENTING STORED PROCEDURES
Introduction to Stored Procedures. Working with Stored Procedures. Implementing Parameterized Stored Procedures. Controlling Execution Context.

DESIGNING AND IMPLEMENTING USER-DEFINED FUNCTIONS
Overview of Functions. Designing and Implementing Scalar Functions. Designing and Implementing Table-Valued Functions. Considerations for Implementing Functions. Alternatives to Functions.

RESPONDING TO DATA MANIPULATION VIA TRIGGERS
Designing DML Triggers. Implementing DML Triggers. Advanced Trigger Concepts.

USING IN-MEMORY TABLES
Memory-Optimized Tables. Natively Compiled Stored Procedures.

SQL SERVER CONCURRENCY
Concurrency and Transactions. Locking Internals.

PERFORMANCE AND MONITORING
Extended Events. Working with extended Events. Live Query Statistics. Optimize Database File Configuration. Metrics.

ADMINISTERING MICROSOFT SQL SERVER DATABASES

05 DAYS
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INTRODUCTION TO SQL SERVER DATABASE ADMINISTRATION
Database Administration Overview. Introduction to the SQL Server Platform. Database Management Tools and Techniques.

INSTALLING AND CONFIGURING SQL SERVER
Planning SQL Server Installation. Installing SQL Server. SQL Server Installation Options and Settings. Post-Installation Configuration.

WORKING WITH DATABASES AND STORAGE
Introduction to Data Storage with SQL Server. Managing Storage for System Databases. Managing Storage for User Databases. Moving Database Files. Working with Filegroups. Configuring the Buffer Pool Extension.

PLANNING AND IMPLEMENTING A BACKUP STRATEGY
Understanding SQL Server Recovery Models. Planning a Backup Strategy. Backing up Databases and Transaction Logs. Using Backup Options. Ensuring Backup Reliability.

RESTORING SQL SERVER DATABASES
Understanding the Restore Process. Restoring Databases. Advanced Restore Scenarios. Working with Point-in-Time Recovery.

IMPORTING AND EXPORTING DATA
Introduction to Transferring Data. Importing and Exporting Table Data. Copying or Moving a Database.

MONITORING SQL SERVER
Introduction to Monitoring SQL Server. Dynamic Management Views and Functions. Performance Monitor.

TRACING SQL SERVER ACTIVITY
Tracing SQL Server Workload Activity. Using Traces. Working with Extended Events.

MANAGING SQL SERVER SECURITY
Introduction to SQL Server Security. Managing Server-Level Security. Managing Database-Level Principals. Managing Database Permissions. Working with Contained Databases.

AUDITING DATA ACCESS AND ENCRYPTING DATA
Auditing Data Access in SQL Server. Implementing SQL Server Audit. Encrypting Databases.

PERFORMING ONGOING DATABASE MAINTENANCE
Ensuring Database Integrity. Maintaining Indexes. Automating Routine Database Maintenance.

AUTOMATING SQL SERVER MANAGEMENT
Automating SQL Server Management. Implementing SQL Server Agent Jobs. Managing SQL Server Agent Jobs. Managing Job Step Security Contexts.

MONITORING SQL SERVER BY USING ALERTS AND NOTIFICATIONS
Monitoring SQL Server Errors. Configuring Database Mail. Configuring Operators, Alerts, and Notifications.

18 - 22 November 2024
27 - 31 January 2025
31 March - 4 April 2025

LEARNING GOALS
This course provides students with the knowledge and skills to maintain a Microsoft SQL Server 2022 or previous version.
The course focuses on teaching individuals how to use SQL Server product features and tools related to maintaining a database.

TARGET AUDIENCE
The primary audience for this course is individuals who administer and maintain SQL Server databases.

SQL SERVER PERFORMANCE TUNING AND OPTIMIZATION

05 DAYS
USQLOP

CPU AND PROCESS SCHEDULING
Threads and workers. Worker thread binding. Wait statistics analysis.

IO AND DATABASE STRUCTURE
Databases in SQL Server. Working with Data files. Using and configuring Filegroups. Log files.

MEMORY USE
Dynamic memory allocation. Memory consumers. Monitoring memory consumption.

DATA TYPES AND TABLES
Importance of data type selection. Storage cost. Variable versus fixed length. Implicit and explicit data type conversions.

INDEXES AND STATISTICS
Heaps. Clustered and non-clustered indexes. Monitoring allocation units. Creating filtered indexes. Indexes and statistics. Reading statistics. How the Query Optimizer uses statistics. Using filtered statistics. Working with indexed views. Configuring delayed durability.

QUERY EXECUTION AND QUERY PLANS
Execution context. Execution plans. Plan cache and plan reuse. Plan recompilation. Parameterization. Query store. Adaptive Query Processing. Automatic regressed plan detection.

INDEX AND QUERY TUNING
Understanding the query plan operators. How to measure query cost. Common query tuning techniques.

IMPROVED CARDINALITY ESTIMATOR
Cardinality estimates. Improvements in the new cardinality estimator. Which estimator is used? Discovering slower queries with the Query Store.

CONCURRENCY AND TRANSACTIONS
Transactions. Optimistic versus pessimistic concurrency control. Locking and lock types. Isolation levels. Monitoring locks. Deadlocks.

MONITORING SQL SERVER
Performance monitor. Profiler. Configuring Extended Event sessions.

WORKING WITH COLUMNSTORE INDEXES
Introduction to columnar data storage. Introduction to Rowgroups and segments. Creating Clustered ColumnStore Indexes. Creating NonClustered ColumnStore Indexes. Fragmentation in ColumnStore indexes. Real-time Operational Analytics.

WORKING WITH IN-MEMORY OLTP
Planning for In-Memory tables. Creating In-Memory tables. In-Memory tables and indexes. Working with Native Compiled Stored procedures.

14 - 18 October 2024
2 - 6 December 2024
24 - 28 February 2025
14 - 18 April 2025

LEARNING GOALS
This course delves into SQL Server performance tuning and optimization techniques, equipping participants with the knowledge and skills needed to maximize the efficiency and responsiveness of SQL Server environments. It provides in-depth coverage of the SQL Server internal architecture essential for effectively tuning SQL Server.

The course targets both SQL Server 2022 on-premises (or earlier) and cloud based solutions (Azure SQL Databases or Azure Managed Instances).

TARGET AUDIENCE
This course is targeted towards database administrators, developers, and anyone responsible for managing SQL Server databases seeking to enhance their skills in performance tuning and optimization. Participants should have a basic understanding of SQL Server fundamentals, including database design, SQL querying, and administration concepts.

U2U TRAINING CENTER

OUR LOCATION

U2U NV/SA
Z1 Researchpark 110
1731 Zellik (Brussels)
Belgium

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info@u2u.be
www.u2u.be
VAT BE 0541 885 352

HOW TO GET THERE?

BY CAR
U2U is located adjacent to the Brussels ring-road (R0) at exit 10. Our training center provides ample parking space.

BY BUS
From the bus stop 'Ganshoren Sport' (bus 84 or 87), it is a 5-minute walk to our training center.

BY TRAIN
The walk from Sint-Agatha-Berchem city railway station to the U2U training center takes about 15 minutes.

BY PLANE
From Brussels International Airport, it takes 15 minutes by taxi or 35 minutes by train to reach U2U. From Brussels South Charleroi Airport, it takes less than one hour by shuttle bus, train, or taxi.