Robotic Process Automation Design & Development v2.0
Course Description

Overview

The Robotic Process Automation (RPA) Design & Development course offers comprehensive knowledge and professional-level skills focused on developing and deploying software robots. The course assumes no prior knowledge of RPA. It starts with the basic concepts of Robotic Process Automation. It further builds on these concepts and introduces key RPA Design and Development strategies and methodologies specifically in the context of UiPath products. A student undergoing the course shall develop the competence to design and develop a robot for a defined process. The course also prepares the student for - UiPath RPA Associate v1.0 Exam. The course consists of 40 hours theory component and an associated 20 hours practice/lab exercise component.

Audience

This course is intended for industry professionals and University Engineering students who want to acquire the skills of designing and developing robots for process automation.

Pre-requisite Knowledge/Skills

To understand and complete the course successfully the student must have basic programming skills.

Course Objectives

Upon successful completion of this course, students should be able to:

- Prepare to become Junior RPA Developers
- Learn the basic concepts of Robotic Process Automation
- Develop familiarity and deep understanding of UiPath tools
- Develop the ability to independently design and create robots for business processes
- Develop skills required to pass UiPath RPA Associate v1.0 Exam

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Course Outline

The 40-hour Theory course is divided into 8 lessons:

Lesson 1: Robotic Process Automation Basics
Lesson 2: Introduction to UiPath
Lesson 3: Variables and Arguments
Lesson 4: Selectors
Lesson 5: Control Flow
Lesson 6: Data Manipulation
Lesson 7: Automation Concepts and Techniques
Lesson 8: Orchestrator

Labs

The Lab component of the course is 20 hours, consisting of exercises mapped to the Theory portion of the course. Each exercise helps the student practice and apply the skills learned in the Theory section of the course.

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Capstone Projects

At the end of the course, the student can choose from 6 Capstone Projects. Each project involves application of all the concepts learnt during the course. The Capstone Projects are further divided into 4 basic projects and 2 advanced projects. The advanced projects are more challenging compared to the basic projects and require more efforts for successful completion.

Classroom Requirements

Recommended student-teacher ratio is 24:1

Projector & white board

Each student should have a laptop with MS Office

Access to Internet for students and Instructor

Course Contents

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Lesson 1: RPA Basics

a. History of Automation
b. Story of Work
c. Introduction to RPA
d. RPA vs. Automation
e. RPA and AI
f. RPA and emerging ecosystem
g. Industries best suited for RPA
h. Processes that can be Automated

Lesson 2: Introduction to UiPath

a. UiPath and its products
b. Robots and their types
c. Studio Overview
d. Orchestrator
e. UiPath Studio Installation
f. The User Interface
g. Features of Studio
  - Managing Activities Packages
  - Managing Extensions
  - Reusing Automation Library
  - Version Control
  - Introduction to Automation Debugging
  - Activities Guide
h. Building Hello World Robot

Lesson3: Variables and Arguments

a. Variables and its types
b. Variables Panel
c. Scope of Variable
d. Arguments
e. Arguments Panel
f. Argument Directions
g. Argument vs Variable

Lesson 4: UI Automation & Selectors

a. UI interactions
b. Input actions and Input methods
  - Input actions: Click, Type Into, Send Hotkey
  - Input methods: Default, SendWindowMessages, Simulate Type/Click

c. Containers
d. Recording & its types
e. Selectors
f. Types of Selectors
- Full and Partial
- Containers and Partial Selectors
- Dynamic Selectors
- Wildcards in Selectors
g. UI Explorer
h. Anchors
i. Debugging selectors

Lesson 5: Control Flow

a. Sequences
b. Control Flow and its types
c. Decision control
- IF
- Switch
- IF vs Switch
d. Loops
- Do While
- While
- For each
e. Other control flow activities
- Delay
- Break
- Assign
- Continue
- Parallel
f. Flowcharts
- Introduction
- Decisions in flowcharts
- Loops in flowcharts
- Nesting flowcharts and sequences
- Sequences vs. Flowcharts
g. Error handling
- Errors
- Exceptions
- Error handling approach
- Try Catch
- Retry Scope
- Global Exception Handler
- Continue On Error
- Best Practice for Error Handling

Lesson 6: Data Manipulation

a. Data Manipulation and Its Importance
- Introduction & operations
- Data conversion

b. String Manipulations
- Introduction & methods
- RegEx

c. DataTable Manipulations

d. Collection, Its Types and Manipulations
- Lists
- Dictionaries

Lesson 7: Automation Concepts and Techniques

a. Extraction and its techniques
- Screen scraping
- Data scraping
- PDF Extraction

b. Automation techniques
- Workbook and Excel automation (read/write)
- Email Automation

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Lesson 8: Orchestrator

a. Orchestrator Overview
b. Publishing a Robot to Orchestrator
c. Orchestrator Functionalities
d. Orchestrator User Interface
- Categories of functionalities
  - Automations
    - Processes
    - Triggers
    - Queues
    - Transactions
    - Assets
  - Management
    - Folders
    - Users
    - Roles
    - Robots
    - Environments
    - Machines
    - Packages
    - Libraries
  - Monitoring
    - Robots
    - Jobs
    - Queues
    - Logs

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Lab Exercises

S. No.	Lab Exercise	Duration (mins)	Problem statement	Lesson Mapping
1	Exercise 1	45	Download and install UiPath Studio	2
2	Exercise 2	30	Install UiPath Studio Extension in Browsers 1. Chrome Browser 2. Firefox Browser	2
3	Exercise 3	30	Install Activity Packages in UiPath Studio 1. Excel Activity Package Installation 2. Email Activity Package Installation 3. PDF Activity Package Installation	2
4	Exercise 4	30	Version Control using TFS	2
5	Exercise 5	30	Build a workflow that prints "Hello World" in a message box.	2
6	Exercise 6	30	Build a workflow that swaps the values of two variables using a third variable. 1. Ask the User to input two numeric values and store in two variables. 2. Swap values of both the variables with each other using a third variable. 3. Display initial and swapped values of both the variables in the Output panel.	3
7	Exercise 7	45	Build a workflow that uses different Input Methods to input data in a Notepad. 1. Open a Notepad file and type "Automation makes life easier". 2. Minimize the Notepad file using the 'SimulateClick' method. 3. Type "Welcome to the new world of automation" using the 'SendWindowMessages' method. 4. Change the font type to Times New Roman, the font style to Italic, and increase the font size by 5. 5. Close the Font window by clicking Enter.	4
8	Exercise 8	30	Build a workflow that opens a browser and then opens UiPath's website. 1. Open a browser. 2. Open the URL – www.uipath.com. 3. Display "Success" in a message box.	4

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9	Exercise 9	30	Build a workflow using Web Recorder in UiPath Studio to Sign in to UiPath's website. 1. Ask User for his email address and password. 2. Open the login page of UiPath's Website. 3. Sign in to the website using the User's credentials.	4
10	Exercise 10	45	Build a workflow that fills the form on RPAChallenge.com website with organized data from an excel file. 1. Download practice excel file from RPAChallenge.com. 2. Take CompanyName, RoleInCompany, Address, Email, FullName, PhoneNumber from the excel file. 3. Submit data in the RPAChallenge.com form. 4. Use anchor-based selectors for this exercise.	4
11	Exercise 11	45	Build a workflow that replaces double spaces with single spaces from a text stored in multiple Notepad files with different names. 1. Open a notepad file containing text with double space 2. Replace double spaces with single spaces 3. Debug the selector to make the workflow work for Notepad files with different names	4
12	Exercise 12	30	Build a workflow using If statement which tells a user whether he will get the second Marshmallow or not. 1. Ask the user "Do you want to eat your first Marshmallow now or after 5 minutes?" 2. If the answer is "Now", respond with "Oops! You will not get the second Marshmallow." 3. If the answer is "After 5 minutes", respond with "Congrats! You will also get the second Marshmallow." 4. If the answer is other than "Now" or "After 5 minutes", respond with "Invalid Input".	5

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S. No.	Lab Exercise	Duration (mins)	Problem statement	Lesson Mapping
13	Exercise 13	45	Build a workflow using Switch activity that asks users' their eye colour and display their personality in a message box. 1. Ask the User for his eye colour. 2. If the User enters "Blue", respond with "You must be very Brave!" 3. If the User enters "Green", respond with "You must be Generous!" 4. If the User enters "Gray", respond with "You must be very Wise!" 5. If the User enters "Black", respond with "You must be very Bold!"	5
14	Exercise 14	30	Build a workflow for a 'Guessing Game' with the following conditions: 1. Generate a random number and prompt the User to input a number. 2. In case of a wrong input, a message is displayed to the User stating 'Please enter a lesser/greater number'. 3. The loop keeps on running until the input number equals the generated number.	5
15	Exercise 15	30	Build a workflow using While loop that tells the User if the input is a prime number or not. 1. Ask the User to input a number. 2. Check if it is a prime number. 3. If the input number is prime, then display "It is a prime number" in a message box. 4. If the input number is not prime, then display "It is not a prime number" in a message box.	5
16	Exercise 16	30	Build a workflow to display file names from a folder in the Output panel and also store names in an MS Word file. 1. Locate and select a folder containing multiple files. 2. List the directory path of all the files in the Output panel. 3. Also, store the updated names in MS Word file and save and close it.	5

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17	Exercise 17	45	Build a workflow using Parallel activity to do the following: 1. Perform the following activities in parallel: 1.1. Search UiPath website on Google, copy about UiPath from the search result. 1.2. Search "What is automation" on Google, copy the definition from the search result. 1.3 Search "Automation future" on Google; copy the first search result. 2. Finally, store all copied text in an MS Word file. 3. Save and close the MS Word file.	5
18	Exercise 18	45	Build a workflow that asks User for his name and two-digit lottery number and displays if he is a winner. 1. Ask the name of the User and two-digit lottery number. 2. Give the User five chance to enter the correct lottery number. 3. If entry is below 54 and above 64, display "Enter your lottery number. X chance remaining." Here, X is the number of remaining chances for User. 4. If entry is between 54 and 64, display, "Congratulations User! You won the lottery." Replace User with the name of the User. 5. If chances end before correct entry, display "Sorry, you lost. No more chances are remaining."	5
19	Exercise 19	30	Build a workflow using Try Catch activity to do the following: 1. Take Name, Gender, and Age as user input. 2. Subtract current year with Age value to get Year of Birth. 3. Handle an error that occurs due to a reckless user input who filled a wrong age containing the 11-digit number. 4. Continue the process to display the Name, Gender, and Year of Birth of the User in a message box.	5
20	Exercise 20	30	Build a workflow using .ToString method that converts an integer to string. 1. Ask the User to input his name and age. 2. Subtract age of the User with the current year to get User's year of birth. 3. Display the name and year of birth in a message box in string format.	6

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S. No.	Lab Exercise	Duration (mins)	Problem statement	Lesson Mapping
21	Exercise 21	45	Build a workflow using Format, Join, IndexOf, Split, and Substring methods that extracts key information from a text and prints in a different format. 1. Use the text "You always wanted to study Automation Training. The materials are available in the following places: UiPath Blog, UiPath Academy." for extraction. 2. Extract "get Automation Training" from the first sentence. 3. Extract "UiPath Blog" and "UiPath Academy" from the second sentence. 4. Display "get Automation Training from: UiPath Blog; UiPath Academy" in a message box.	6
22	Exercise 22	30	Build a workflow using Split and Contains methods that extract sentences containing "RPA" from a UiPath webpage. 1. Open URL "https://www.uipath.com/rpa/robotic-process-automation" 2. Copy text from the webpage. 3. Store all sentences from the text in an array using Split method. 4. Loop through each sentence and identify sentences containing "RPA" using Contains method. 5. Store all identified sentences in an MS Word file.	6
23	Exercise 23	45	Build a workflow using data table activities to join two library databases using matching student ID and display output in a message box. 1. Create a data table variable and populate it with student ID and name of students. 2. Create another data table variable, and populate it with student ID and book names 3. Join both the data tables based on matching student ID. 4. Remove student ID column and sort the final data table as per student names in alphabetical order from A to Z. 5. Display final data table containing student and book names in a message box as a string.	6

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24	Exercise 24	45	Build a workflow using Concat and Join method that merges two lists containing the UK and Spain city names, sorts it, capitalizes the first letter of each item, and displays it in a message box. 1. Create a list containing three UK cities in all capital letters. 2. Create another list containing three Spain cities in small letters. 3. Merge both the lists together. 4. Sort the final list in alphabetical order from A to Z. 5. Capitalize only the first letter of all the items in the final list. 6. Display the final list in a message box in string format.	6
25	Exercise 25	30	Build a workflow using Screen Scraper Wizard that scrapes text using Tesseract OCR scraping method from an image and stores in a Notepad. 1. Search for "text images" in Google Images. 2. Pick one image containing text from the search results. 3. Scrape the text from the image using Tesseract OCR. 4. Store text in a Notepad file.	7
26	Exercise 26	30	Build a workflow using Screen Scraper Wizard that scrapes text using Full-Text scraping method and stores in a Notepad file. 1. Search for "UiPath" in Google Search. 2. Scrape information about UiPath shown on the top right of the result page using Full-Text scraping method. 3. Store text in a Notepad file.	7
27	Exercise 27	30	Build a workflow using Data Scraping wizard that scrapes blog post titles from UiPath Blog from multiple pages. 1. Open UiPath Blog (https://www.uipath.com/blog). 2. Extract all blog titles and URL by navigating through all pages. 3. Store scraped data in an Excel file.	7

S. No.	Lab Exercise	Duration (mins)	Problem statement	Lesson Mapping
28	Exercise 28	30	Build a workflow using Read PDF Text activity and extract only Email IDs and Phone Number from a PDF file and store in an MS Word file. 1. Download the practice excel file available on rpachallenge.com. 2. Convert the file to PDF to use in this exercise. 3. Read data from the PDF file using Read PDF Text activity. 4. Extract only First Name and email IDs from the PDF and store in an MS Word file.	7
29	Exercise 29	30	Build a workflow using Read Range and Append Range activity to read data from a workbook and append data to another workbook. 1. Create an excel file containing names of any five cities in small letters. 2. Read the data from the file using Read Range activity. 3. Convert all city names in capital letters. 4. Add the updated names in a new spreadsheet using Append Range activity.	7
30	Exercise 30	30	Build a workflow that calculates total monthly deposit of a bank from an Excel file and store output in a new sheet. 1. Download the Excel file link given for practice. 2. The file contains three deposit categories – Cash In, On-Us Check, and Not On-Us Check. 3. Calculate the total amount received in all three categories for June. 4. Store calculated values in a new sheet in the same excel file.	7
31	Exercise 31	45	Build a workflow that extracts attachments from the emails containing the word "Resume" in its subject. 1. Set up IMAP configuration to access the email. 2. Loop through each email to identify subjects containing the word "Resume". 3. Download the attachments from the identified emails in a folder.	7

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32	Exercise 32	45	Create an Asset of Credential type in orchestrator and display the credential asset username in Studio. 1. Create a credential type asset in orchestrator to store username and password. 2. Update asset details through Studio to a different value. 3. Store username in the Output panel.	8
33	Exercise 33	45	Create a Queue in orchestrator and add excel data values in the queue. 1. Use excel file data downloaded from RPAChallenge.com. 2. Create a queue in orchestrator called invoice process. 3. Populate the queue with the data taken from the excel sheet.	8

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Lecture Planning

Lecture	Lesson Name	Learning Objective
1	RPA Basics	Describe the history of automation Describe the story of work Compare RPA and Automation Compare RPA and AI
2	RPA Basics	Explain RPA and AI Describe RPA and emerging ecosystem List the industries best suited for RPA Identify the processes that can be automated
3	Introduction to UiPath	Describe UiPath and its products Explain Robots and analyze their types
4	Introduction to UiPath	Explain Studio Describe Orchestrator
5	Introduction to UiPath	Install and update UiPath Studio Describe the User Interface
6	Introduction to UiPath	Explain the features of Studio Build "Hello World" Robot
7	Variables and Arguments	Define variable and explain its types Explain variables panel Explain the scope of variables

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Lecture	Lesson Name	Learning Objective
8	Variables and Arguments	Explain arguments Explain arguments panel Describe and use argument directories Compare argument and variable
9	Selectors	Describe UI interactions Explain and use input actions & methods
10	Selectors	Describe containers Explain recording and analyze its types
11	Selectors	Describe selector and analyze their types
12	Selectors	Explain and use anchors
13	Selectors	Explain and demonstrate debugging of selectors
14	Control Flow	Describe Sequences Explain control & its types
15	Control Flow	Explain decision control
16	Control Flow	Explain and use different types of loops – 1
17	Control Flow	Explain and use different types of loops – 2
18	Control Flow	Explain and use different types of loops – 3
19	Control Flow	Explain & use other control flow activities – 1
20	Control Flow	Explain & use other control flow activities – 2
21	Control Flow	Explain & use other control flow activities – 3
22	Control Flow	Explain & analyze flowcharts – 1
23	Control Flow	Explain & analyze flowcharts – 2
24	Control Flow	Explain error handling – 1
25	Control Flow	Explain error handling – 2
26	Data Manipulation	Describe data manipulation and its importance
27	Data Manipulation	Explain and perform string manipulations
28	Data Manipulation	Explain and perform string manipulations
29	Data Manipulation	Explain and perform DataTable manipulations
30	Data Manipulation	Explain collection, its types, and manipulations
31	Data Manipulation	Explain collection, its types, and manipulations
32	Automation Concepts and Techniques	Explain extraction and apply its techniques – Screen Scraping
33	Automation Concepts and Techniques	Explain extraction and apply its techniques – Data Scraping

Lecture	Lesson Name	Learning Objective
34	Automation Concepts and Techniques	Explain extraction and apply its techniques – PDF Extraction
35	Automation Concepts and Techniques	Explain and use automation techniques – Workbook automation
36	Automation Concepts and Techniques	Explain and use automation techniques – Excel automation
37	Automation Concepts and Techniques	Explain and use automation techniques – Email automation
38	Orchestrator	Describe Orchestrator Publish a Robot to Orchestrator
39	Orchestrator	Explain functionalities of Orchestrator - Assets
40	Orchestrator	Explain functionalities of Orchestrator - Queues

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Educator Pre-requisites

Instructors teaching the Robotic Process Automation Design and Development Course should have:

- Excellent communications skills
- Knowledge of enterprise software and it's usage
- Advanced knowledge of Microsoft Office suite
- Knowledge of data, data handling and data processing
- Expertise in logical and qualitative analysis
- An engaging demeanour, and a proven ability of explaining complex concepts using stories and use cases relevant to students
- Passion to explore new technology
- A good understanding and knowledge of AI, Machine Learning, and how they are being used in the industry