NIRMA UNIVERSITY

Institute:	Institute of Technology, School of Technology
Name of Programme:	MTech CSE
Course Code:	6CS375ME25
Course Title:	Robotic Process Automation
Course Type:	Department Elective-II
Year of Introduction:	2025-26

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Course Learning Outcomes (CLO):

At the end of the course, the students will be able to:

1. explain automation and RPA methodologies, including process flowcharts, programming constructs, bot types, and control flow architecture (BL2)
2. demonstrate proficiency in RPA tools by configuring environments and manipulating data (BL2)
3. develop optimized RPA workflows using best practices in process identification, workflow design, debugging, and automation (BL3)
4. combine advanced RPA features like APIs, OCR, exception handling, and bot orchestration to enhance automation efficiency. (BL6)

Unit	Contents	Teaching Hours (Total 30)
Unit-I	**Introduction to RPA:** History of Automation - RPA vs Automation, Processes & Flowcharts, Programming Constructs in RPA, Types of Bots, RPA Development methodologies, Difference from SDLC, Robotic control flow architecture, Process Design Document/Solution Design Document, Risks & Challenges with RPA, RPA and emerging ecosystem	04
Unit-II	**RPA Tools and Platforms:** Introduction to UiPath: Installation and Setup, Overview of Power Automate and Automation Anywhere, Variables, Arguments, and Data Manipulation in RPA	06
Unit-III	**Designing RPA Workflows:** Process Identification for Automation, Workflow Design Principles and Best Practices, Recording and Playback Features in RPA Tools, RPA Development Environment: Navigating Tool Interfaces, Building Simple RPA Bots: Step-by-Step Guide, Debugging and Troubleshooting in RPA, Hands-on: Automating Simple Data Entry and Web Scraping Tasks	06
Unit-IV	**Advanced RPA Features:** Integration with APIs and Web Services, Optical Character Recognition (OCR) and Document Understanding, Handling Exceptions and Error Management, Scheduling and Orchestrating Bots, Hands-on: Automating Complex Tasks with Decision Logic	08
Unit-V	**RPA in Enterprise Context:** Scalability and Performance, Optimization of RPA Solutions, Security and Governance in RPA, Integrating RPA with Artificial Intelligence and Machine Learning,	06

Managing RPA Teams and Roles in an Enterprise, Deploying and Maintaining bot, Case Studies: Large-Scale RPA Deployments.

Self-Study:

The self-study contents will be declared at the commencement of the semester. Around 10% of the questions will be asked from self-study content.

Suggested Readings/ References:

1. Frank Casale, Rebecca Dilla, Heidi Jaynes, Lauren Livingston, Introduction to Robotic Process Automation: a Primer, Institute of Robotic Process Automation
2. Alok Mani Tripathi, Learning Robotic Process Automation, Packt
3. Srikanth Merianda, Robotic Process Automation: Guide to Building Software Robots, Consulting Opportunity Holdings
4. Richard Murdoch, Robotic Process Automation: Guide To Building Software Robots, Automate Repetitive Tasks & Become An RPA Consultant, Independently Published.

Suggested List of Experiments:

Sr. No.	Name of Experiments/Exercises	Hours
1	Setting up an RPA Environment: UiPath/Automation	02
2	Automating Data Entry	02
3	Automate sending emails with dynamic content based on input from an Excel sheet	02
4	Extract structured data (e.g., product details or prices) from a website and save it into a CSV file	02
5	Create an RPA workflow with error-prone input and implement exception handling to manage errors	04
6	Design a bot that uses conditional statements to decide actions (e.g., categorize email content into folders)	02
7	Automate the extraction of text from scanned documents (e.g., invoices or receipts) using OCR tools in UiPath	04
8	Build an automation that retrieves data from a REST API and uses it as input for further tasks (e.g., fetching weather details and saving them to a file)	04
9	Use UiPath Orchestrator or Automation Anywhere Control Room to schedule and monitor a bot	04
10	Develop and deploy an end-to-end RPA workflow to solve a real-world problem, such as: Automating employee onboarding by extracting details from resumes.	04