

Advances in Robotic Process Automation

(94-886 / 94-486)

Spring 2021 Mini 4 (6 units)

Class times: Thursday 6:30 – 9:20 pm (Eastern time)

Location: In-person (HBH TBD) and/or remote instruction online using Zoom

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Overview

Today's new generation of sophisticated workforce robots act across business functions, integrate cloud and legacy applications, and are self-managing, scalable and fully dynamic. This course is an introduction into the fundamentals of Robotic Process Automation (RPA) and how it is transforming the world by combining software robotics with the power of artificial intelligence (AI) and machine learning (ML). RPA is software-based robotics that emulate the repetitive work that people do. RPA is changing the way organizations digitize and transform business processes and how they interact with their employees, customers and competitors.

During the course we will dig into the technology, understand how advanced RPA delivers business value, identify processes ripe for this automation, and build an RPA business case. We will also discuss the talent implications of bringing bots to work and the impact it has on the organization and its workforce.

Throughout the course we will be joined by business leaders who will share their experiences and leverage exercises designed to provide hands-on automation opportunities including use of a RPA environment.

https://api.heinz.cmu.edu/courses_api/course_detail/94-886

Course Learnings

The main learning objectives of the course:

1. Describe Intelligent Automation and its impact on the transformation of business
2. Apply the technologies and best practices used to enable process automation
3. Identify areas where Intelligent Automation is applicable and formulate its value (quantify and qualify).

Canvas

There are no required texts. An online site with this syllabus, readings, links, and other resources has been created in Canvas at <https://canvas.cmu.edu/courses/20356>

Course Prerequisites

All students are required to have their own laptops with a Windows compliant operating system (Windows 8.1 or 10 (64-bit versions). Minimum 10GB free disk space).

For Mac users, please make sure you have a running Windows 8 or 10 environment to install Blue Prism's Learning Edition.

CMU Computing Services (see below) can provide the necessary software or support prior to starting class.

<https://www.heinz.cmu.edu/current-students/computing-services/software>

Office of Computing Services

Heinz College
Carnegie Mellon University
5000 Forbes Avenue
Hamburg Hall, Room A200
Pittsburgh, PA 15213
Phone: (412) 268-3425
Email: heinz-computing@andrew.cmu.edu

Recommended Reading/Activities (prior to this class)

Gartner Top Strategic Technology Trends for 2021

<https://www.gartner.com/smarterwithgartner/gartner-top-strategic-technology-trends-for-2021/>

Video: <https://youtu.be/s3rIYWcWdDY>

"Will machines replace humans? Daniel Susskind TED 2017

https://www.ted.com/talks/daniel_susskind_3_myths_about_the_future_of_work_and_why_they_re_not_true

The Twelve Mega Themes That Will Drive Our Future World

<https://www-forbes-com.cdn.ampproject.org/c/s/www.forbes.com/sites/sarwantsingh/2019/08/28/the-twelve-mega-themes-that-will-drive-our-future-world/amp/>

Intelligent Automation: A new era of innovation (Deloitte)

<https://www2.deloitte.com/us/en/insights/focus/signals-for-strategists/intelligent-automation-a-new-era-of-innovation.html>

Intelligent Automation: How Robots and AI Are Redefining The Rules (Forbes)

<https://www.forbes.com/sites/cognitiveworld/2019/02/25/intelligent-automation-how-robots-and-ai-are-redefining-the-rules/#3cac99aa1203>

The engine at the core of the next-generation operating model (McKinsey)

<https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/intelligent-process-automation-the-engine-at-the-core-of-the-next-generation-operating-model>

Homework, Group Projects and Grading

This course will be assessed by means of pre-class assignments, automation exercises, attendance, participation and a Group project. The Group project is based on a project and includes a final presentation and report in which you will work in a small group or team to scope and design an automation of a specific process.

There will be 7 homework assignments each due at midnight (eastern time) the day before class and a Group Project per the following schedule:

	Assignments
1.	Common use cases for automation
2.	Examples of Business Value from RPA
3.	Blue Prism Induction training + exercise
4.	Assessing a process and building a business case
5.	Processes Definition Document (specification templates)
6.	The Future of Work
7.	Group Project (Teams): Automation Use Case and ROI

Grading

- Each assignment will count for **10%** of the grade (Total **60%**)
- A Group project: includes presentation which is presented on the last Thursday of the class with a final report due the following Tuesday, will count for **30%** of the grade
- The remaining **10%** will be based on attendance and class engagement see below
- There is no final exam for this class

Submissions

Assignments are required to be submitted through Canvas the day it is due (day before class). Students have until midnight (eastern time) to submit. They will not be accepted past the due date and time unless a religious observance or a documented medical condition prevents on-time submission and the student has consulted with the instructor in advance for approval of an alternate deadline. Files are required to be submitted in Portable Document Format (PDF) and named in this manner: `firstname_lastname_team # if appropriate_assignment#.pdf` (example: Jennifer_Honig_Team 1_A4_Final Presentation Outline.pdf). Instructions for each submission will be posted to Canvas and the rubric will be provided in class.

Engagement, Attendance and Participation Policy

This course is geared around class working sessions, guest speakers, lectures, and discussions. Engagement includes active involvement and participation in

discussions, presenting materials, Thursday exercises, and sharing experiences around the subject of Intelligent Automation and AI.

In order to participate, students need to be present. Within the first week of our course, please look ahead and see if you need to miss class for any excusable reason (religious observance, job interview, university-sanctioned event, etc.) and notify us as soon as possible. In addition, excused absences will come up, but they need to be communicated to the instructors ahead of time.

Due to the small class size and limited meeting times, we want to have time to modify any of the working sessions accordingly. We also may be able to make alternative arrangements for completing tasks we accomplish during the class.

In order to pass the course, you must attain a final grade of 60% or more. Due to the limited number of classes, attendance and engagement are important elements of your grade.

Grading Scale

The following criteria provide guaranteed letter grades if a student's overall scored fall within the stated range:

Grading Scale		Interpretation
98-100%	A+	Excellent, exceeds average understanding as evidenced in course work and goes well beyond the basics.
92.0-97.9%	A	
90.0-91.9%	A-	
88.0-89.9%	B+	Far above average, fully meets average understanding as evidenced in course work and fully understand the basics and can deal with concepts somewhat beyond that level.
82.0-87.9%	B	
80.0-81.9%	B-	
78.0-79.9%	C+	Average, meets minimum expectations and satisfies course requirements.
72.0-77.9%	C	
70.0-71.9%	C-	
68.0-69.9%	D+	Below average, meets many minimum expectations and satisfies all or most course requirements.
62.0-67.9%	D	
60.0-61.9%	D-	
0 – 59.0%	R	Fails to meet minimum expectations in understanding and course work as evidenced by performance and submission of graded elements.

The grade of A+ is reserved for truly exceptional performance.

Everyone taking the class will receive a letter grade; auditing the class, or taking the class Pass/Fail, is not permitted.

Contacting the Instructor

The easiest and most reliable way to get in touch with us is by email. Please free to send us an email if you have a question related to the course. We will respond as soon

as we can but not always instantaneously. You can also make an appointment to collaborate one-on-one at a time that is mutually convenient.

Feedback

We want you to learn a lot and we hope you enjoy taking this course. So that we can understand what is happening, we encourage feedback – be it positive or negative – in all aspects of the course, at any time during the semester. For example, if something we are doing is making it difficult for you to learn, then say something before it's too late; or if you particularly enjoyed something we did in class, say so that we can do it again. You can go this by just speaking to us, texting us or sending an email. Giving feedback will in no way affect your grade, positively or negatively.

Course Outline

1. Introduction to Automation

During this session we will look back at the formation of Robotic Process Automation over 10 years ago and its evolution into Intelligent Automation with the addition of cognitive capabilities.

2. Building the Business Case

ROI numbers are 30-200% within the first 12 month. This ROI alone enables companies to self-fund their initiatives. What processes make good business cases? What are the low-hanging fruit for companies to begin their journey? This session will explore the creation of the business case and the different elements for consideration from process brainstorming, candidate selection, and developing different elements of the ROI framework. We will work together to build a case for consideration.

3. Technology and Toolsets

There are many technologies and toolsets available. During this session we will dig into the various stages of RPA and its evolution beyond 1.0, assisted RPA, to where we are today with RPA 4.0 which incorporates cognitive capabilities such as AI/ML and has the ability to handle structured/unstructured data.

- Part 1 - RPA - We will review the different capabilities of the RPA toolsets available today.
- Part 2 – Automation's Cognitive Capabilities. What happens when 'bots can take in unstructured/structured data, handle service level agreements regarding priorities, and "learn." This area is leading edge in the ability not only for what 'bots can do within the automation system, but their ability to pair automation with other solutions that will enable true business disruption.

We will be joined by a special guest – Paul Cavanaugh, a leading RPA Thought Leader for Gartner to learn how AI/Other cognitive capabilities are rapidly enabling the expansion of RPA beyond back office applications.

4. Stories from the Field – Best Practices and Lessons Learned

CoEs, Scaling the Practice, Best Practices, and Lessons Learned – the flood gates open quickly as an organization realizes the opportunity with automation to reduce costs and create capacity. What is the best way to build and scale an automation practice? What can we learn from the mistakes of others?

We will be joined by a business leader to discuss their experiences and automation journeys.

5. Future of Work - Workforce Implications

We would be remiss to not address the talent implications of bringing ‘bots to work. Traditional RPA had a 3-5:1 person to bot ratio. Cognitive features are driving it closer to 15:1. This dramatic impact will have a substantive impact on the organization and its workforce. HR has an important role to play in mitigating risk and preparing the organization for this type of impact. During this session we will discuss change management, leading a ‘bot-based workforce, and workforce planning.

6. Group Project and Presentation

The goal of your final presentation is to demonstrate working knowledge you have gained, working in a small group or team on a project. Teams will work on an automation candidate use case focusing on the design and value of an automation.

Supplementary Reading:

There are no required texts – all reading materials or links will be posted in Canvas. The following are some supplementary reading and supportive material which can be reviewed on your own:

Intelligent Automation: How Robots and AI are redefining the rules (Forbes)
<https://www.forbes.com/sites/cognitiveworld/2019/02/25/intelligent-automation-how-robots-and-ai-are-redefining-the-rules/#3cac99aa1203>

Intelligent Automation: A new era of innovation (Deloitte)
<https://www2.deloitte.com/us/en/insights/focus/signals-for-strategists/intelligent-automation-a-new-era-of-innovation.html>

The business leaders guide to robotic and intelligent automation (Deloitte)
<https://www2.deloitte.com/za/en/pages/operations/articles/guide-to-robotic-process-automation-and-intelligent-automation.html>

A Framework for RPA Success: Lessons Learned from a Blue Prism Masterclass
<https://www.blueprism.com/resources/blog/a-framework-for-rpa-success-lessons-learned-from-a-blue-prism-masterclass/>

Course Policies

Academic Integrity

Academic Integrity is expected at all time. Carnegie Mellon has an established well-defined policy on this subject which can be found at: <http://www.cmu.edu/policies/documents/Academic%20Integrity.htm>

It is the responsibility of the student to verse themselves with these policies.

All necessary and appropriate sanctions will be issued to all parties involved with plagiarizing any and all course work. Plagiarism includes, but is not limited to:

- Presenting another writer's work as your own;
- Cutting and pasting content verbatim without using quotation marks to indicate a direct quote or paraphrasing content without citing the source in-text using parenthetical references, footnotes, or endnotes in addition to listing each source on the Works Cited, References, or Notes page in a manner consistent with the format detailed in an approved style guide;
- Providing incomplete or incorrect information about the source cited.

Plagiarism and any other form of academic dishonesty that is in violation with these policies is a serious offense and can result in failing the course and other disciplinary action.

Maintaining a Healthy Balance

Please do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle.

You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful. If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support.

For local help and referrals, please contact the Office of the Dean of Student Affairs in 301 Warner Hall (412-268-2075). Counseling and Psychological Services (CaPS) at the Pittsburgh campus can also help you get connected to support. You can call them at [412-268-2922](tel:412-268-2922) and/or visit their website at <http://www.cmu.edu/counseling/> to learn more .

If you or someone you know is feeling suicidal or in danger of self-harm, call someone immediately, day or night:

CaPS: [412-268-2922](tel:412-268-2922)

Suicide Prevention Hotline: [800-273-8255](tel:800-273-8255) (TALK)

Accommodations for Students with Disabilities:

If you have a disability and have an accommodations letter from the Disability Resources office, I encourage you to discuss your accommodations and needs with me as early in the semester as possible. I will work with you to ensure that accommodations are provided as appropriate. If you suspect that you may have a disability and would benefit from accommodations but are not yet registered with the Office of Disability Resources, I encourage you to contact them at access@andrew.cmu.edu.

Covid Information:

Although we are using a Hybrid Model, the class, its slides and its exercises will be recorded and held via Zoom. The benefit of this model is should we need to move to an online model it will not require any transition. For more information and resources for the CMU community, see <https://www.cmu.edu/coronavirus/index.html>