

# IMPACT REPORT FY 2024

**Purdue Information Technology**

# Message from the CIO



For Purdue IT, FY24 marked a year of immense change. Individuals from various IT backgrounds, academic units and campus locations collaborated as we further established an integrated Purdue IT organization, a process that began under the leadership of CIO Ian Hyatt. In May 2024, Purdue President Mung Chiang appointed Ian as his Chief of Staff, effective July 1.

This report highlights the impact and accomplishments Purdue IT achieved from July 1, 2023, to June 30, 2024. Through it all, we continued to follow our three guiding pillars:

- **People** – Developing the skills and talents of our workforce.
- **Processes** – Refining and improving our processes towards operational excellence.
- **Technology** – Delivering the right technologies to solve the right problems at the right time.

I want to thank Ian for his steadfast leadership since assuming the role of CIO in June 2021. He laid a foundation for a newly imagined Purdue IT, setting a goal to become the premier IT organization in higher education, and I look forward to carrying that torch into the future.

Boiler up!

Christian Theumer  
CIO & Vice President of Information Technology

## Purdue achieves certification for IT services

In May 2024, Purdue University earned three certifications from the International Standards Organization (ISO):

- **ISO 9001** Quality Management System
- **ISO 27001** Information Security Management System
- **ISO/IEC 20000-1** Service Management System

ISO certification is a credential that shows a product, process, service, or system meets specific quality, safety or efficiency standards defined by the International Standards Organization, a non-governmental organization that sets specifications for various industries.

Purdue is one of the first higher education institutions in the U.S. to earn certification of three ISO standards focused on delivering high-quality IT services. According to data from the ISO Institute, as of 2022 only four other educational institutions globally were certified in ISO 20000-1. In addition, Purdue seeks to obtain ISO certification in Business Continuity Planning in FY25.



### Mission

Purdue IT provides the technology infrastructure, services, solutions, and information security that support teaching and learning, enhance research, and enable faculty and staff to achieve their objectives while providing a positive student experience.

### Vision

To empower giant leaps across Purdue by providing safe, efficient and reliable services in our pursuit to become the benchmark for IT in higher education.

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# END USER EXPERIENCE



## Service Desk Tickets (7/1/23-6/30/24)

- 250,709 Tickets Created

## Ivy.ai Chats (7/1/23-6/30/24)

- 11,528 = Chat Volume
- 11,246 to IT Help Desk
- 282 to Bursar
- 1,220 Tickets Submitted to TDX through Ivy.AI

## Cisco VoIP Calls to Service Desk (7/1/23-6/30/24)

- 80,959 = Calls Presented
- 75,687 = Calls Handled
- 3,814 = Calls Abandoned by Customer

## Customer service portal serves users at all campuses

In July 2023, Purdue IT launched its new ticketing and customer service portal, TeamDynamix (TDX). The portal is designed to streamline the process of resolving technical issues for customers across all Purdue campuses. Accessible at service.purdue.edu, TDX allows users to easily submit requests, report issues and access self-service resources.

One of its key features is an extensive, searchable knowledge base, which empowers customers to find solutions on their own, reducing the need to contact the service desk. Additionally, the portal includes a detailed service catalog, making it easy for users to identify and access available IT services.

Since its launch, TDX has expanded its use beyond IT support. It is now utilized by several non-IT departments, with many more currently in development. This growing adoption highlights TDX's role as a central hub for customer service and support across the Purdue community.

## Ivy.ai chatbot provides fast, 24/7 IT support

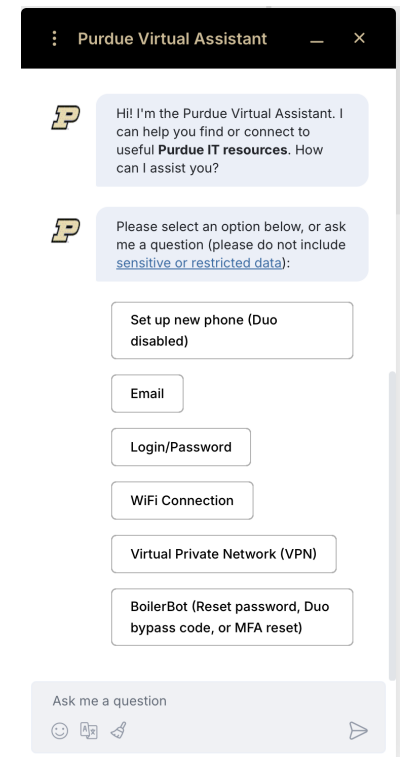
Along with the launch of its customer service portal, TeamDynamix (TDX), Purdue IT also rolled out a new Ivy.ai chatbot designed to connect users with useful IT resources quickly.

“With the recent rollout of the TeamDynamix ticketing system and web portal, students, faculty and staff can now search for answers in a modern knowledgebase packed with hundreds of help articles,” said Executive Director of End User Experience Dwight Snethen. “The added bonus is that we are now providing a chatbot that not only looks for answers in the same knowledgebase, but it also crawls across the Purdue IT website, SecurePurdue and Research Computing sites looking for answers that get customers up and running quickly and that don’t require a support agent to intervene.”

Users can access the chatbot, also known as the Purdue Virtual Assistant, by clicking on the speech bubbles found in the lower right corner of the Purdue IT website. Simply type a full question or a few keywords, and Ivy will answer based on information on the Purdue website and TDX knowledgebase. Currently, Ivy does not have the ability to connect users with a live agent through chat, but it can give the appropriate phone number to call or help submit a ticket to the IT Service Desk.

Ivy uses artificial intelligence to pull information from Purdue IT websites and has the ability to learn over time. If users get an incorrect, unhelpful or bizarre response, they should click the thumbs down button. Likewise, if they receive helpful information, they should give it a thumbs up. Both actions help the bot to improve its responses.

Ivy got its first big test during the week of Aug. 13 -19, when many students returned to campus for Boiler Gold Rush (BGR). Common questions were related to using two-factor authentication, resetting passwords and connecting to Wi-Fi. Out of 226 chats, Ivy gave a “high confidence” response 73 percent of the time. The use of Ivy expanded to the office of the Bursar with plans to expand into other non-IT business units.





# Piloting self-service ordering for computer hardware

In June 2024, Purdue IT piloted Device as a Service, a self-service process to order Windows and Apple computer hardware for individual users through a simple online form.

“We intend to use feedback from testers to create a one-stop location for end users to easily pick the Apple or Windows machine they want along with any accessories and place the order,” said Deanna Shafer-Rater, Director, Endpoint Management Services. “This streamlining will give control to the end user for the ordering process while allowing computing staff to focus more on support issues rather than procurement of machines.”

## AI AND AUTOMATION

### Citizen Developer Program expands automation efforts

In fall 2023, Purdue embarked on a Citizen Developer Program, which enabled stakeholders outside of Purdue IT to create automations that enhance their business operations.

The Citizen Developer Program is a low code/no code deployment approach of UiPath, a global software company that specializes in robotic process automation. It enables citizen developers with the relevant technology to discover automation opportunities, build automations and measure impact. The pilot program included participants from different areas of the university.

John Lahrman, principal analyst six sigma/lean, joined the program in an effort to streamline, simplify and automate common manual tasks for Human Resources. “In HR, we are using the Citizen Developer Program to enable our group to develop and deploy ‘quick win’ solutions to support our staff by reducing or eliminating repetitive manual tasks across various departments and system applications,” Lahrman said. “We have found the technology relatively easy to set up automations and have had great success so far. Our staff love these bots as they can spend more time on higher value activities while utilizing the bot as a sidekick administrative assistant. Our staff still control when the bot runs, they can monitor the progress/activity in real-time, and the bot solutions utilize our staff’s existing security for each system as needed. Make no mistake, our staff still has full control and awareness of each bot, but they get the value of a faster typing assistant that doesn’t make typing errors.”

Citizen developers began with UiPath online training, which allowed them the opportunity to follow along step by step in each exercise within StudioX. In November, UiPath held a bot-a-thon on Purdue’s campus to give citizen developers the opportunity to engage with the experts and test out their developing skills on exercises and use cases. Participants then developed, tested and deployed their individual use cases.

With the initial citizen developers use cases during the pilot program, these automations have generated up to approximately 1600 staff hours saved through June 2024 and continues to increase as the Citizen developers explore new use cases in their areas.

### BoilerBot provides additional self-service options for users

Purdue continued to expand its Robotic Process Automation (RPA) capabilities through enhancements to the BoilerBot chatbot. Students and employees at Purdue’s West Lafayette and Indianapolis campuses can now reset their Microsoft Multifactor Authentication (MFA) using BoilerBot. The RPA team is exploring the feasibility of expanding this functionality to additional campuses.

Microsoft MFA is a security feature linked to a mobile phone number that is required to access Purdue Outlook and Office 365 applications. Resetting MFA accounts is necessary whenever a person obtains a new phone, tablet or number. Previously, individuals would need to call the Service Desk to reset their MFA, which accounted for about 3% of calls or tickets.

“BoilerBot gives customers the ability to handle password resets and two-factor related support on their own, without having to wait on the phone,” said Dan Rhine, IT Service Management. “BoilerBot works when it’s convenient for the customer. It’s always there, ready to help them regain access to their account. Customers being able to self-support frees up Service Desk staff to address pressing issues that could impact teaching and learning.”

### Access to GPT-4 available to Purdue faculty, staff and students

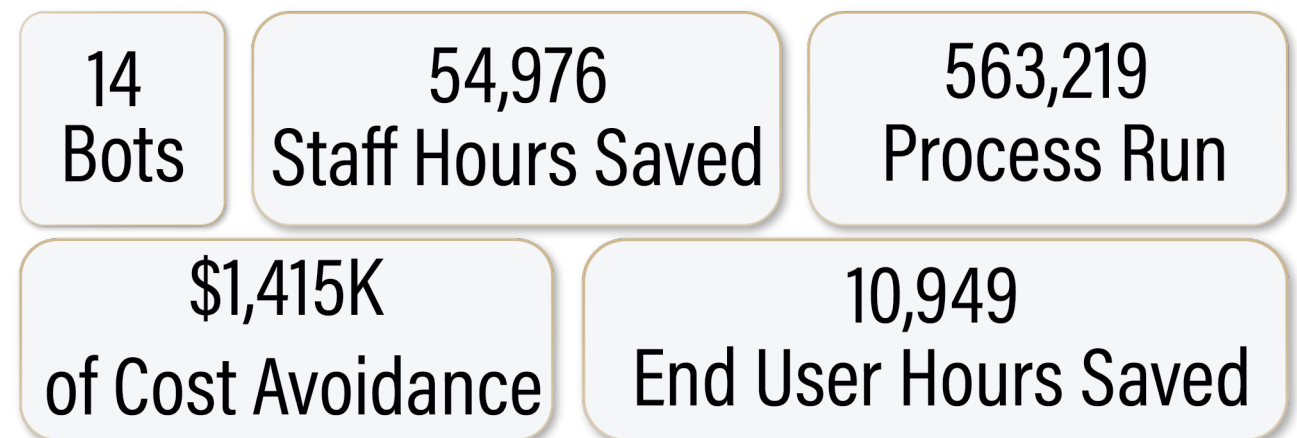
Purdue University faculty, staff and students have access to GPT-4 through Microsoft Copilot with Data Protection. Previously branded Bing Chat Enterprise (BCE), Copilot with Data Protection ensures that user and organizational data is protected. Users can access Copilot with Data Protection by signing in with their campus-specific Purdue account.

“While it is built on the same foundational GPT-4 model and initial data as ChatGPT, Copilot with Data Protection also has access to Internet data from 2022 to present,” said Preston Smith, executive director for the Rosen Center for Advanced Computing at Purdue.

Unlike Copilot for Microsoft 365, Copilot with Data Protection does not access M365 files and data. Chat data is not saved, and chat data will not be available in any capacity to Microsoft or other large language models to train their AI tools against.

“Microsoft Copilot provides generative support for the entire Purdue community, in research, in outreach and in education,” said Eugenio Culurciello, professor of bioengineering and director of the Institute for Physical Artificial Intelligence (IPAI) at Purdue University. “We are excited about the prospects of accelerating the development of AI science assistants.”

## Robotic Process Automation



(7/1/23-6/30/24)



# CYBERSECURITY

## Cybersecurity awareness training for faculty and staff helps protect Purdue at another level

In February 2024, Purdue implemented mandatory cybersecurity awareness training for Purdue University faculty and staff systemwide. The Verizon 2023 Data Breach Investigations Report indicates that 74% of all breaches include the human element, with people being involved either via error, privilege misuse, use of stolen credentials or social engineering. According to IBM's annual report, the average cost of data breaches for higher education institutions was up to \$3.7 million in 2023. Through mandatory training, Purdue aims to mitigate the risk of individuals falling victim to cyber-attacks.

Enhanced security measures resulted in a

**23%**  
*decrease on the secondary layer*

**10%**  
*reduction in Purdue's cyber risk insurance*

## Purdue earns "superior" rating for industrial security from the Defense Counterintelligence and Security Agency

In May 2024, the Defense Counterintelligence and Security Agency (DCSA) conducted a day-long industrial security review, rating Purdue University as "superior" and establishing Purdue among the top 2 percent in industry for industrial security compliance and effective counterintelligence programs and measures.

Investigators from DCSA examined Purdue's security policies and procedures, facilities and training records, and interviewed university personnel to ensure policies and training were being conveyed and followed appropriately.

A high rating from DCSA is critical as Purdue pursues future national security work and contracts. It communicates to industry and government partners that Purdue is a trustworthy and reliable institution to entrust with sensitive defense and national security research.



## Transition to new vulnerability management platform

In FY24, Purdue Systems Security successfully completed phase one of the transition to Rapid7's Managed Vulnerability Management (MVM) platform. Phase one included installing agents on approximately 30,000 assets and starting discovery scans, authenticated scans and unauthenticated scans on over 57,000 assets. Agents scan and report status every six hours, which gives much quicker feedback for new and remediated vulnerabilities. In addition, this new MVM platform provides a console where every IT team has access to enhanced reporting and dashboards



## Purdue IT recognized for security best practices

ISO 27001 is an international auditable standard for Information Security Management Systems (ISMS). It defines requirements for policies, procedures, processes, and systems that manage information security risks. In May 2024, Purdue became one of a small number of higher education institutions in the United States to achieve this certification in addition to ISO 20000-1, for IT Service Management System, and ISO 9001, for Quality Management System. ISO 27001 certification demonstrates that Purdue IT adheres to security best practices and continuous improvement, which in turn, improves relationships with donors, students, and partner businesses.





# DISTRIBUTED CAMPUSES

## Purdue IT: Beyond West Lafayette

Purdue IT continues to provide information technology services to Purdue campuses in West Lafayette, Fort Wayne and Purdue Northwest. During FY24, Purdue IT staff worked diligently alongside Indiana University counterparts to transition operations from IUPUI to Purdue University in Indianapolis, an extension of Purdue's West Lafayette campus, which launched July 1, 2024.



Among the work Purdue IT teams performed behind the scenes:

- Purdue network installation and configuration
- Distribution of assigned telephone numbers
- Virtual and physical server migrations
- On-going data migration to Purdue systems
- Business and student app configurations, data exchanges, and shared processes
- Lab and workstation migrations and software configuration
- Setting up multiple brand-new computer labs

### Colleges

- College of Engineering
- Polytechnic Institute
- College of Science

### Students: 2,862

- Transitioning undergraduate students: 1,857
- Transitioning graduate students: 156
- New students: 849

### Faculty: 156

- Transitioning faculty: 96
- Limited-term lecturers: 60

### Staff: 94

- Transitioning: 37
- New: 57

# NETWORK & INFRASTRUCTURE

## New wireless network for University Residences

In July 2023, Purdue IT launched the UR Home wireless network in all residence halls across campus including student rooms and common areas. The equipment updates provide residential students access to additional services.

"Our previous system was quickly becoming outdated, making it difficult for students to use current technology in our environment," said ResNet Service Administrator Steve Rounds. "UR Home allows us to make use of Purdue's newly installed wireless hardware, which is much more capable and should provide students with an improved experience similar to what they're accustomed to from a home network."

UR Home provides students with their own version of an 'in-home' experience. Once they have created their account, students can connect their multiple devices (printers, gaming consoles, Roku, Amazon Alexa, visitor access, etc.) in their own private network using a single access key. UR Home uses a student's housing assignment and Purdue credentials to authenticate devices within their assigned residence hall.

## Telephone system updates for West Lafayette

Purdue IT made several changes and updates to the West Lafayette campus, including completion of the long-running project to retire a more than 25-year-old phone switch. Updates included the conversion of remaining analog phone lines, utilization of 10-digit dialing for all outgoing calls and discontinuation of access cards for international calling.

## Redundant internet for Purdue Northwest and Purdue Fort Wayne

With the addition of separate, redundant internet to the regional campuses in Ft. Wayne and Hammond/Westville, network redundancy and reliability was increased. This provides for internet access and ability to access tools even if the connection to West Lafayette is severed.



### By the Numbers Microsoft

(7/1/23 - 6/30/24)

- 232,480 Calls
- 576,022 Chat Messages
- 517.72M Emails Received
- 43M Emails Sent
- 1,560 TB Storage Used

### Meetings

(7/1/23 - 6/30/24)

- 470,995 = Microsoft Teams
- 476,782 = Zoom
- 45,189 = Webex



# RESEARCH COMPUTING

*Purdue's Rosen Center for Advanced Computing (RCAC) provides advanced computational resources and services to support Purdue faculty and staff researchers. The center also conducts its own research and development to enhance the capabilities of these resources.*



RCAC PIs are leaders on several large research awards supporting CI professionals, campus networking enhancements, digital forestry, and sustainability.

Anvil, Purdue's most powerful supercomputer, continues its pursuit of excellence in HPC as it enters its third year of operations, and with an additional \$5M supplemental funding from the National Science Foundation has joined the National AI Research Resource (NAIRR) as a resource provider.

In April 2024, Purdue's Rosen Center for Advanced Computing (RCAC) celebrated the 20th anniversary of its Envision Center, a group dedicated to assisting, supporting, and collaborating with faculty, students, and industry in scientific visualization, virtual and augmented reality, and media creation.

Resources for AI continued to grow, with significant expansions of GPUs and a new parallel filesystem in the Gilbreth system, which is optimized for throughput AI.

## The Value of High-Performance Computing (HPC)

### Sponsored Research

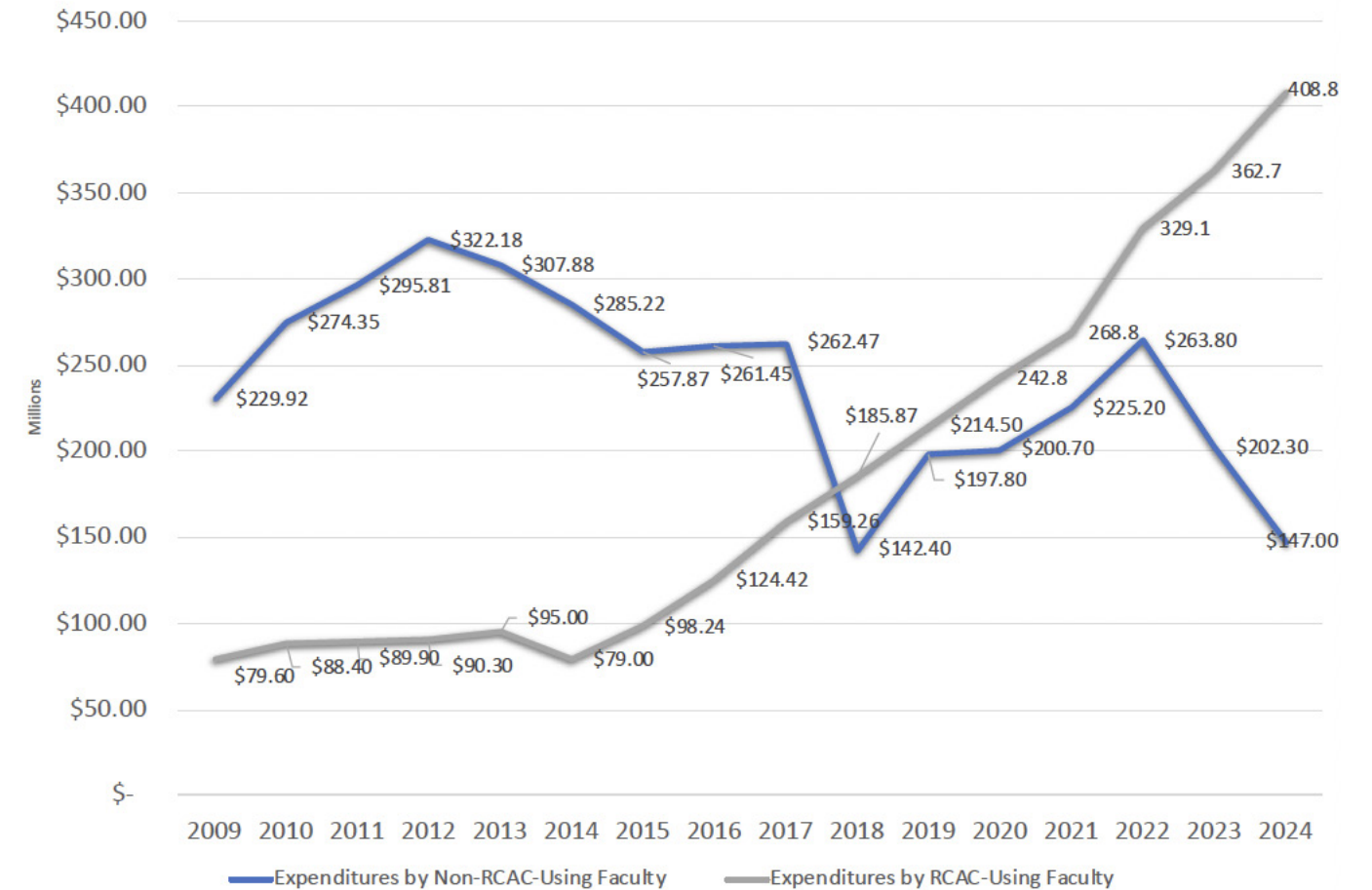
# 73%

RCAC-using faculty accounted for 73% of sponsor expenditures in FY24

# \$408.4M

A total of \$408.4M.  
(Up from 64%/\$352.7M in FY23)

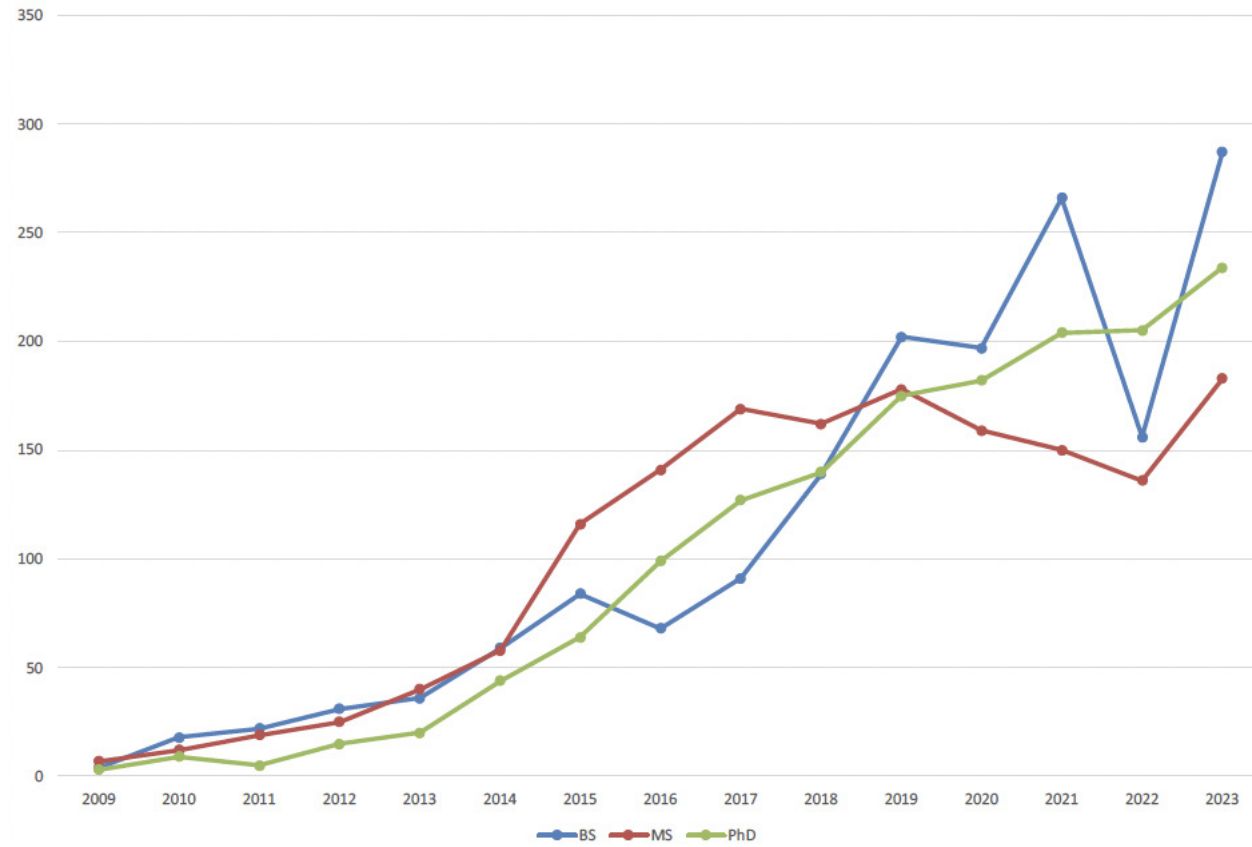
Purdue Sponsored Research Expenditures - HPC vs non-HPC Researchers



## Impact on Degrees

HPC is critical for training future scientists. 233 of FY24's 864 earned Doctorates (27%) have been an HPC user during their career.

Degrees Awarded to HPC Users by Academic Year



Year	Earned Doctorates	HPC-Using Doctorates	% Using HPC
2010	639	9	1%
2011	672	5	1%
2012	656	15	2%
2013	687	20	3%
2014	735	44	6%
2015	709	64	9%
2016	727	99	14%
2017	740	127	17%
2018	758	140	18%
2019	738	175	24%
2020	808	182	23%
2021	802	204	25%
2022	835	205	25%
2023	851	234	27%

## Impact on Courses

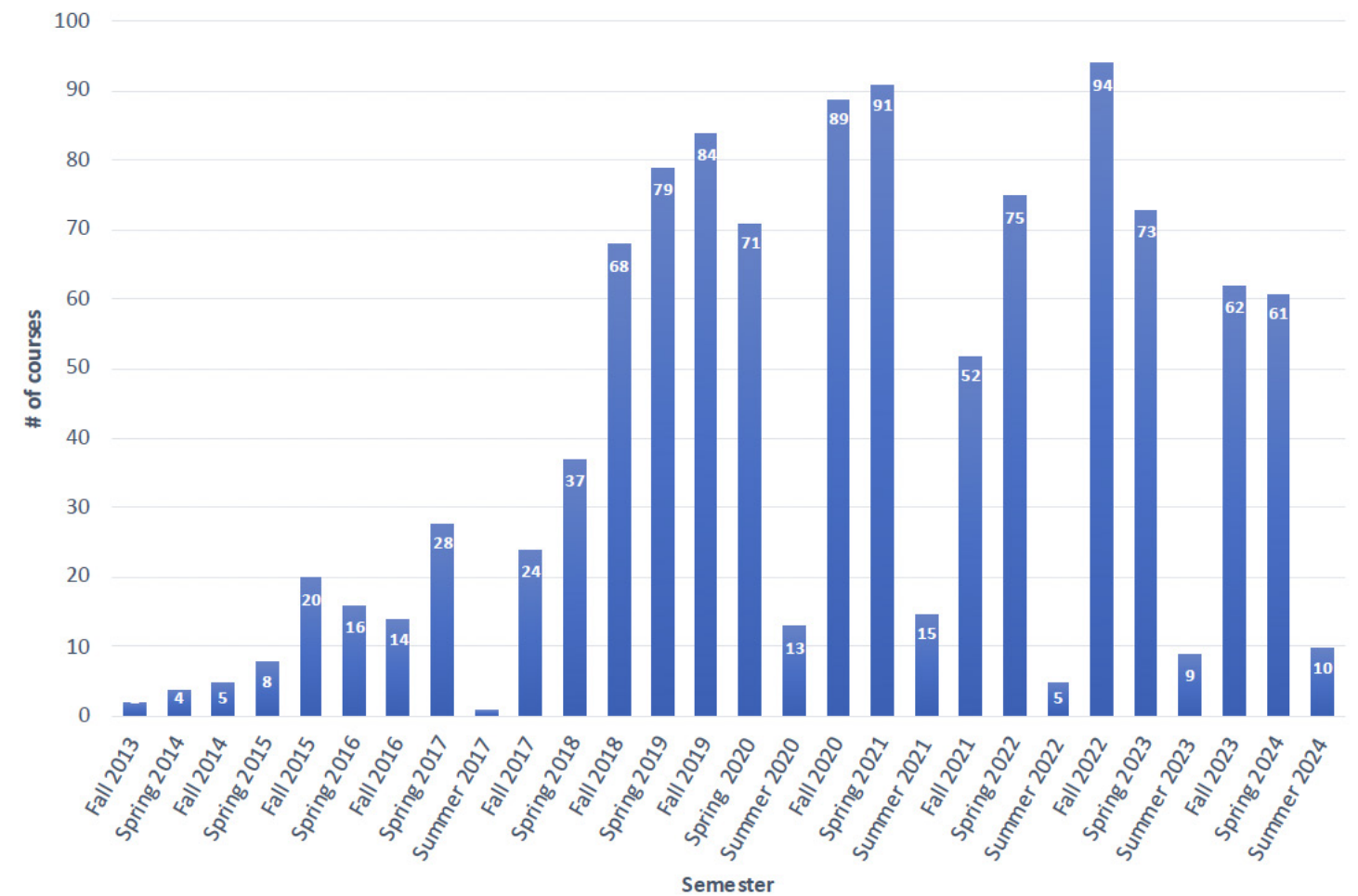
**121**  
*Courses*

During the 2023-24 Academic Year (Fall 2023 – Summer 2024 semesters), 121 courses used HPC for instructional purposes

**5500**  
*Students*

Impacting a total of over 5500 students. (167 courses, 3000 students used HPC in AY23-23)

Courses Using HPC, per Semester





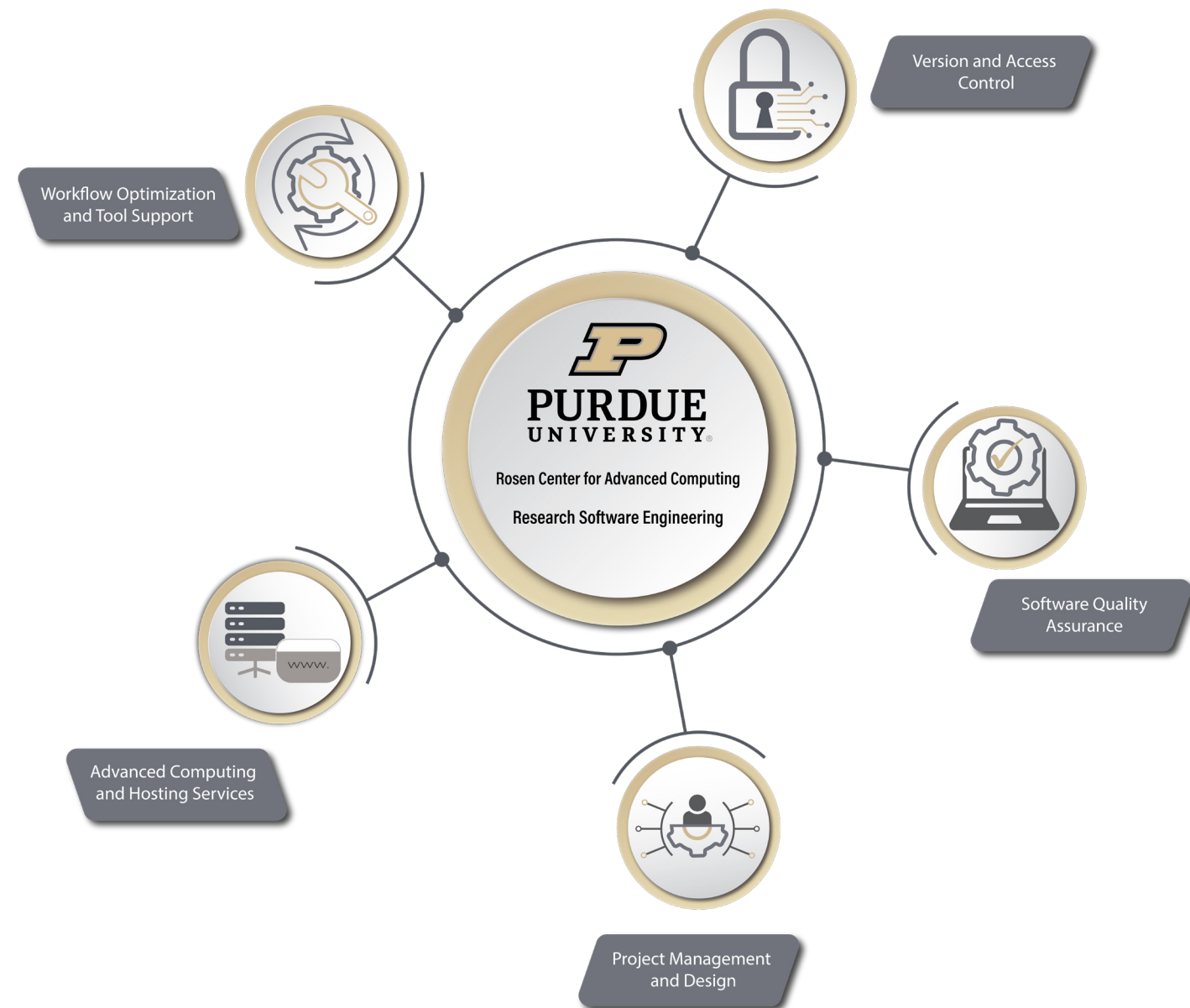
## Opening of Purdue Center for Research Software Engineering

The Purdue Center for Research Software Engineering (the RSE center) recently opened its doors as a university-approved center within the Rosen Center for Advanced Computing. Its official establishment recognizes the increasingly vital role that software plays in all fields of scientific research and formalizes RCAC's software engineering efforts at RCAC to better support research at Purdue.

The RSE center's mission: To help accelerate research and increase their impacts through the creation of innovative, robust and sustainable research software.

With streamlined processes for project intake and management, consistent software engineering practices and oversight, proposal development, and business management, the new RSE center will increase capacity to better support the university's large and strategic initiatives and center needs.

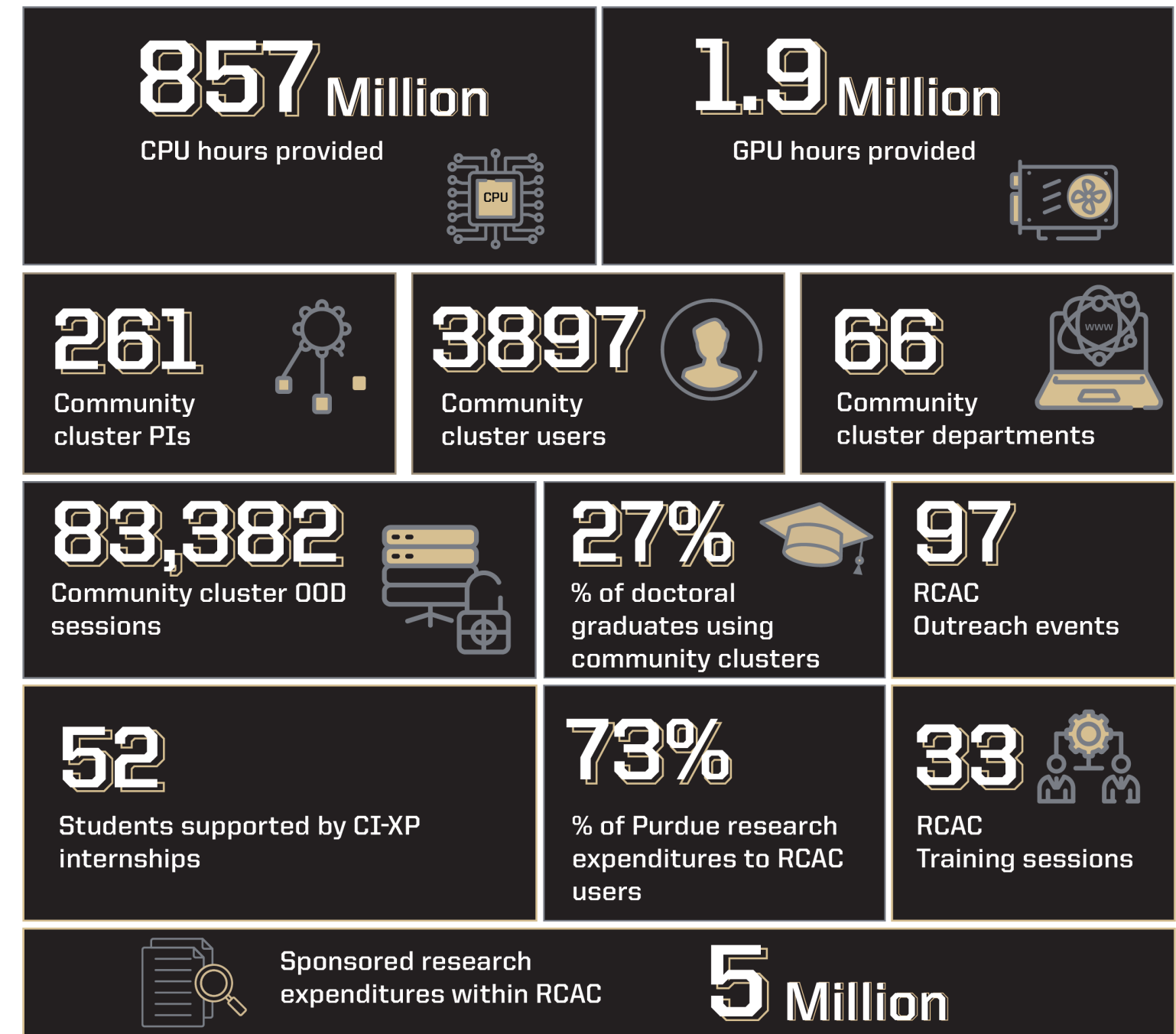
### Purdue RSE Services:



## Anvil supercomputer slated to assist with national pilot project aimed at advancing AI

Purdue University's Anvil supercomputer is now an official resource provider for the newly launched National Artificial Intelligence Research Resource (NAIRR) Pilot.

The NAIRR is a National Science Foundation (NSF) project aimed at creating a national infrastructure that connects U.S. researchers to responsible and trustworthy Artificial Intelligence (AI) resources. The NAIRR will also provide these researchers equitable access to the data, software, training, computational, and educational resources needed to advance research, discovery, and innovation within the field of AI.



# PROFESSIONAL DEVELOPMENT

## Spotlight: Updates to Gilbreth GPU Cluster

After expanding the Gilbreth community cluster's GPU nodes in 2022 and yet again last year, the Rosen Center for Advanced Computing (RCAC) has once again added even more GPUs to the Gilbreth cluster to meet demand from the Purdue community.

With the recent addition of 80 NVIDIA A100 GPUs inside 20 Dell PowerEdge xe8545 compute nodes, the Gilbreth cluster now has 411 GPUs, nearly four times its original capacity.

The Gilbreth cluster's storage capacity was also doubled and upgraded to include an improved design that results in faster storage transactions and reduces researchers' time to science.

The nodes include NVIDIA's NVLink technology, which allows for faster communication between the GPUs and will improve speed and access to memory for researchers who use multiple GPUs at once.

All of these upgrades to Gilbreth are part of RCAC's ongoing investment in supporting researchers doing AI and machine learning work, and dramatically accelerating physics-based simulations. Due to the swift sell-out of recent expansions upon implementation, RCAC has proceeded to augment Gilbreth by adding nodes to effectively meet the escalating demand.

The infrastructure expansion supports RCAC's broader strategic plan to offer AI and machine learning expertise, offer new trainings, and partner with faculty on proposals.

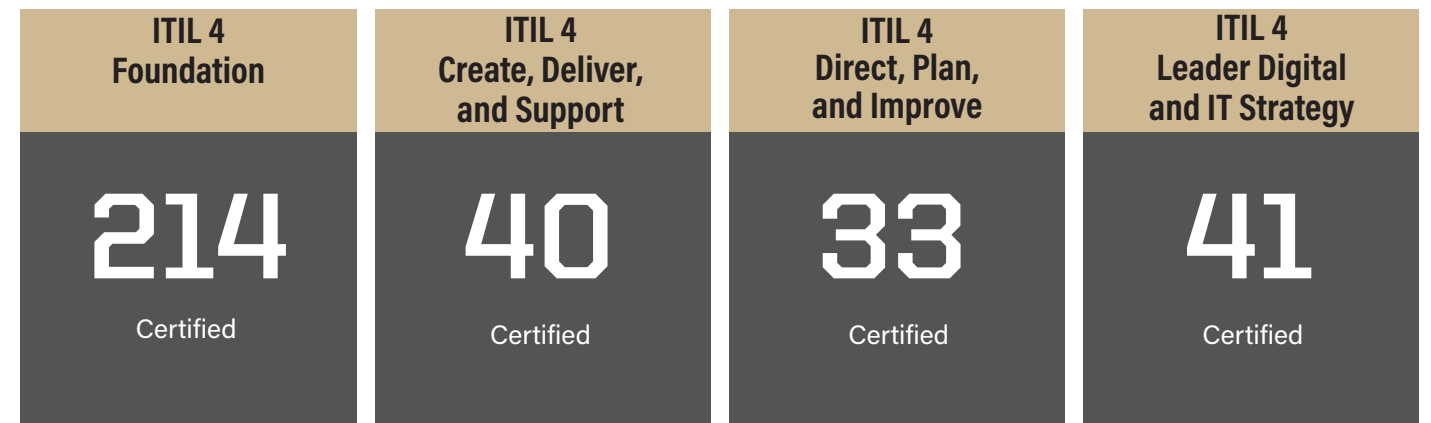


## ITIL 4 Framework

Purdue IT continues to use the Axelos IT service management framework ITIL (IT Infrastructure Library) to create an agile, flexible organization that focuses on creating value for customers. ITIL gives all Purdue IT employees a common language and framework for delivering IT as a service, regardless of an individual's role or area of expertise.

Hewlett Packard Enterprise (HPE) conducts the multi-day courses, teaching the basic concepts of ITIL and how to implement them. In addition to taking the courses, Purdue IT employees may also seek ITIL certification.

ITIL 4 Certification breakdown for FY24 July 1, 2023, through June 30, 2024:



- Agile Framework - 17 Staff
- Tuck Executive Education at Dartmouth - 6 Staff
- Purdue University Daniels School of Business Courses - 5 Staff
- Purdue Global Courses - 11
- Conference Attendees - 58 Staff
- Conference Presenters - 18 Staff
- Workshops Attendees - 53 Staff
- Certifications (Cisco, CompTIA or Microsoft) - 10 Staff
- Other Independently Completed Training/Certification - 80 Staff

\*Based on self-reported data from staff





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