AWS Ramp-Up Guide: Academic Research

For Academic Researchers and Cloud Professionals in the Research Domain

These are the most salient learning resources from our classrooms, digital curricula, video library, and AWS Lab Environment, that relate to Academic Research.

This guide organizes learning resources into *four* domains that are applicable to Academic Research: ***Artificial Intelligence (AI)***, ***Machine Learning (ML)***, ***Generative Artificial Intelligence (Generative AI)***, and ***High-Performance Computing (HPC), Quantum*** and the guide also contains essential AWS knowledge for ***Statistician Researchers*** and ***Research IT Professionals***. Learners may consume materials from those domains relevant to the them. This guide will help you decide where to begin, and which step is next. (Instructor-led training and some workshops require assistance from AWS Professionals in a live environment.)

Researchers who want to first learn cloud fundamentals may wish to use SkillBuilder's ***Cloud Essentials for Researchers*** Learning Plan or the ***Foundational Researcher*** Learning Plan.

Share your opinion of this Ramp-Up Guide with us!

Getting Started with Cloud			
Learning Resource		**Duration (*hrs*)**	**Type**
AWS Cloud Essentials for Business Leaders	Fundamental	2.0	Digital Training

Duration times are estimated.

In this domain, you will be introduced to 7 components on Artificial Intelligence (AI) and Machine Learning (ML), and 10 components on Generative Artificial Intelligence (Generative AI). The first 7 AI/ML components start with a Fundamentals of ML and AI and followed by ML Terminology and Process, Amazon SageMaker, developing ML applications, a deep dive into SageMaker technical aspects, how to get started with Tabular Data, and finishes with Computer Vision. The 10 components on Generative AI cover topics including an introduction to AI followed by planning a Generative AI project, responsible AI Practices, security, compliance, and governance for AI solutions. The Generative AI topics also include how to get started with Amazon Bedrock, followed by optimizing Foundation Models, foundations of Prompt Engineering, building Generative AI applications using Amazon Bedrock, Amazon SageMaker Jumpstart Foundations, and building Language Models on AWS.

Pre-requisite: Basic knowledge and understanding of Python.

Artificial Intelligence & Machine Learning			
Learning Resource		**Duration (*hrs*)**	**Type**
Fundamentals of Machine Learning and Artificial Intelligence	Fundamental	1.0	Digital Training
Machine Learning Terminology and Process	Fundamental	1.0	Digital Training
Introduction to Amazon SageMaker	Fundamental	0.3	Digital Training
Developing Machine Learning Solutions	Fundamental	1.0	Digital Training
SageMaker Technical Deep Dive		4.0	Video Playlist
Tabular Data		5.0	Video Playlist
Computer Vision		4.0	Video Playlist

Generative Artificial Intelligence			
Learning Resource		**Duration (*hrs*)**	**Type**
Introduction to Generative AI - Art of the Possible	Fundamental	1.0	Digital Training
Planning a Generative AI Project	Fundamental	1.0	Digital Training
Responsible Artificial Intelligence Practices	Fundamental	1.0	Digital Training
Security, Compliance, and Governance for AI Solutions	Fundamental	1.0	Digital Training
Amazon Bedrock Getting Started	Fundamental	1.0	Digital Training
Optimizing Foundation Models	Fundamental	1.0	Digital Training
Foundations of Prompt Engineering	Fundamental	4.0	Digital Training
Amazon SageMaker JumpStart Foundations	Intermediate	1.0	Digital Training
Building Generative AI Applications Using Amazon Bedrock	Advanced	4.0	Digital Training
Building Language Models on AWS	Advanced	6.0	Digital Training

Duration times are estimated.

This guide will introduce you to 8 components that are essential about Higher Performance Computing on AWS. The course starts with AWS Batch with deep-dive, followed by a research computing immersion day workshop experience. The course also brings you an overview of AWS HPC, how to run batch workloads on Amazon EKS with AWS Batch, running CFD on AWS Parallel Cluster at scale, multi-mode Parallele jobs on AWS Batch, and finishes with Amazon FSx for Lustre Workshop. It is recommended that you go through an AWS immersion day workshop with an AWS professional.

Pre-requisite: Cloud Essentials.

High Performance Computing			
Learning Resource		**Duration (*hrs*)**	**Type**
Learn AWS Batch	Fundamental	1.0	Workshop
AWS Batch Deep Dive	Fundamental	1.0	Workshop
Research Computing Immersion Day Workshop	Fundamental	2.0	Workshop
AWS HPC Overview	Intermediate	4.0	Workshop
Running batch workloads on Amazon EKS with AWS Batch	Intermediate	1.0	Workshop
Running CFD on AWS ParallelCluster at scale	Intermediate	4.0	Workshop
Multi-node Parallel Jobs on AWS Batch	Advanced	1.0	Workshop
Amazon FSx for Lustre Workshop	Advanced	1.0	Workshop

Duration times are estimated.

In this domain, you will be introduced to 9 components that are essential for statistician researchers, who specialize in relevant fields of statistics and quantum analysis, to be proficient on AWS. The course starts with exploring using R on AWS, followed by getting started with EMR, deploying RStudio and performing analysis with Amazon Lighsail for Research (LfR), deploying JupyterLab and performing ML on Amazon LfR, building with Redshift clusters, Sagemaker DeepDive, Machine Learning for Data Scientist, authoring visual analytics using Amazon QuickSight, and finishes with batch analytics on AWS.

Pre-requisite: Cloud Essentials.

Statistician Researcher				
Learning Resource			**Duration (*hrs*)**	**Type**
	Getting started with R on Amazon Web Services			Blog Post
	Amazon EMR Getting Started	Fundamental	1.0	Digital Training
	Deploy RStudio and Perform Analysis with Amazon Lightsail for Research	Fundamental		Workshop
$	Deploying JupyterLab and Performing Machine Learning on Amazon Lightsail for Research	Fundamental	6.0	Workshop
$	Building with Amazon Redshift Clusters	Intermediate	1.0	Self-paced Lab
$	Building Batch Data Analytics Solutions on AWS	Intermediate	6.0	Instructor-led Training
	Amazon SageMaker Technical Deep Dive Series		6+	Video Playlist
$	Amazon SageMaker Studio for Data Scientists	Advanced	18.0	Instructor-led Training
$	Authoring Visual Analytics using Amazon QuickSight	Advanced	12.0	Digital Classroom

Duration times are estimated.

This course is an extension of Foundational Researcher Learning Plan, aiming for Research IT leaders and professionals to dive deeper into specific topics. The course contains 8 components that start with AWS Batch automatic job retry on Spot reclamation followed by working with Open Data on AWS, how to Use Amazon S3 Storage lens to gain insights and optimize costs, AWS Service catalog workshop, understanding the partner landscape, cost guardian workshop, security for Researcher IT (Developers), and finishes with introduction to the AWS Control Tower. The goal of this extension for Research IT professionals is to dive deeper on fundamentals, understand management capabilities & implementing guardrails, cost optimization for Research workloads, familiarize with platforms for research and research partners, and learn further on landing zone and control tower for Research.

Pre-requisite: Foundational Researcher Learning Plan.

Foundational AWS Knowledge for Academic Researchers		
Learning Resource	**Duration (*hrs*)**	**Type**
Foundational Researcher Learning Plan	8.5	Learning Plan

Research IT		
Learning Resource	**Duration (*hrs*)**	**Type**
AWS Batch automatic job retry on Spot reclamation	1.0	Workshop
Working with Open Data on AWS	2.0	Workshop
How to Use Amazon S3 Storage Lens to Gain Insights and Optimize Costs	1.0	Workshop
AWS Service Catalog Workshop	3.0	Workshop
Research and Engineering Studio on AWS	1.0	Webpage
Cost Guardian Workshop	4.0	Workshop
Security for Developers	1.0	Workshop
AWS Control Tower Guide	1.0	Workshop

Amazon Braket Badge - Knowledge Badge Readiness Path		
Learning Resource	**Duration (*hrs*)**	**Type**
Amazon Braket Badge - Knowledge Badge Readiness Path	5.5	Learning Plan

Duration times are estimated.