

# HPC Driver's Ed

RCC Education for Research Support



ITS   
SEMINOLE  
SHOWCASE

# What is the FSU Research Computing Center? (RCC)



- A unit of the FSU Information Technology Services
- Originally a division of Scientific Computing in 2013
- The team that hosts and administers the main supercomputing resource at FSU: the High Performance Computing system (HPC)



# What is High Performance Computing?



## Specialized Hardware

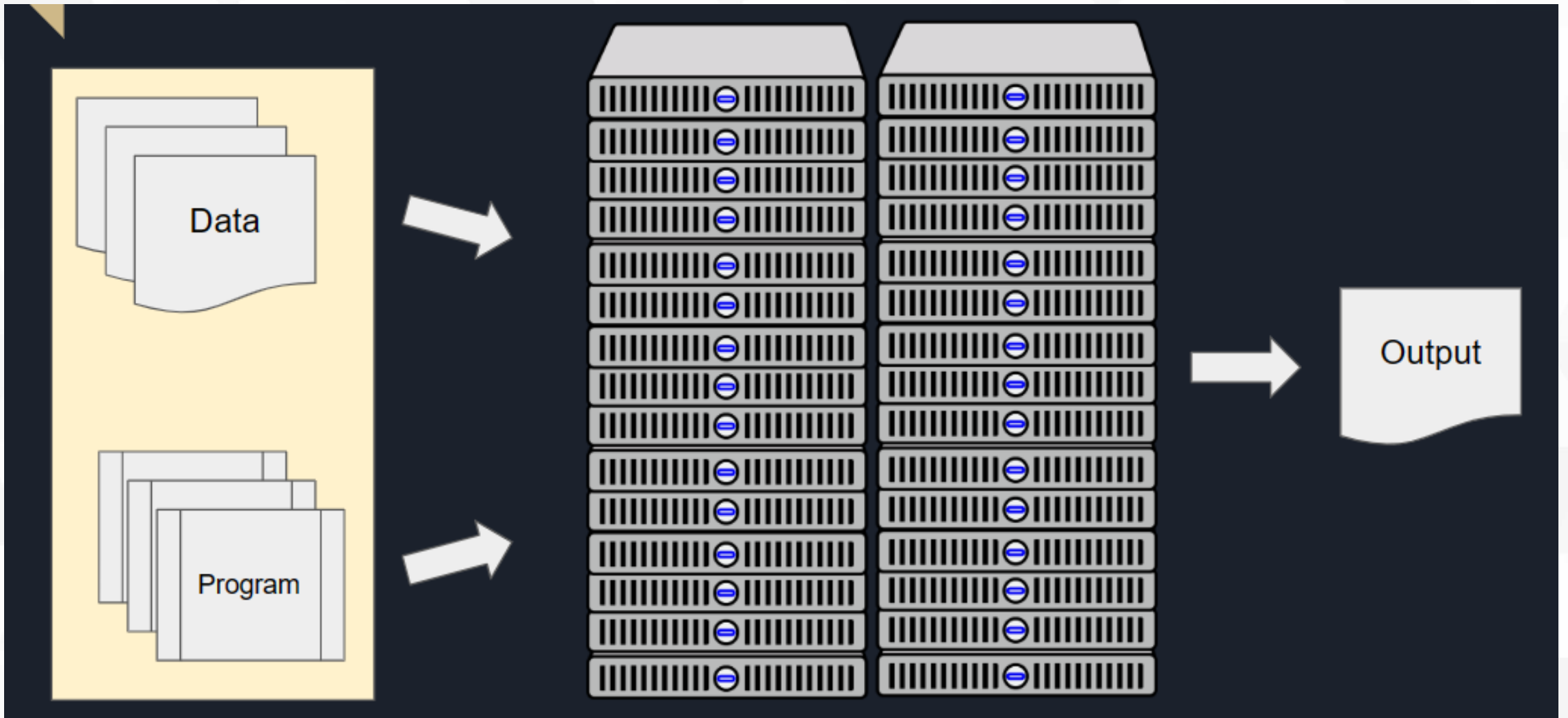
- Contains more processors than the average home computer
- Can house custom machines (via a research grant) with specialized hardware

## Offload your work

- Takes pressure off your regularly used desktop, laptop or other devices
- Run tasks that need to be repeated many times over long periods of time



# What is an HPC job?





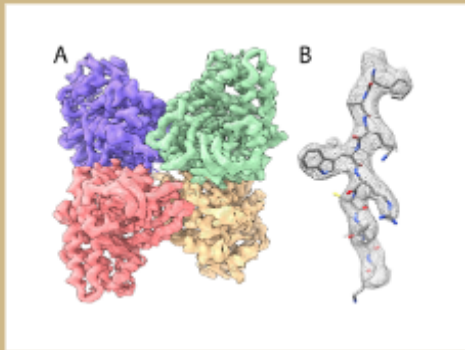
# Examples of RCC Enabled Research



## Molecular Biophysics

3D Image Processing of  
Molecular Structures

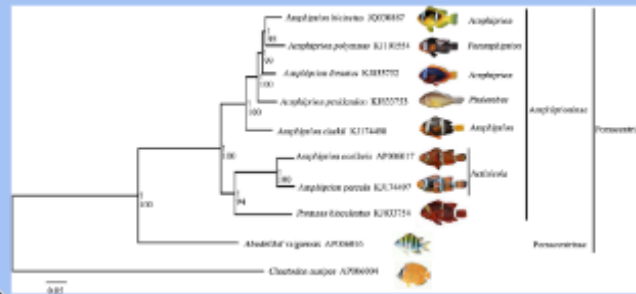
*Dr. Scott Stagg & CryoEM  
Group*



## Population Genetics

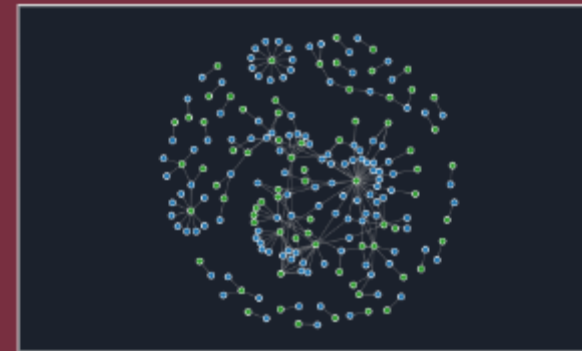
Scalable Inference of  
Population Phylogenetic  
Parameters

*Dr. Peter Beerli*



**Criminology**  
Extremism in Online Forums

*PhD Candidate  
Willis Shaw*



By Jianlong Li, Xiao Chen, Bin Kang, Min Liu - Li J, Chen X, Kang B, Liu M (2015) Mitochondrial DNA Genomes Organization and Phylogenetic Relationships Analysis of Eight Anemonefishes (Pomacentridae: Amphiprioninae). PLoS ONE 10(4): e0123894. doi:10.1371/journal.pone.0123894 <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0123894>, CC BY 2.5, <https://commons.wikimedia.org/w/index.php?curid=49428069>

# RCC Infrastructure



## 665 Nodes

- Beowulf Cluster
- AlmaLinux 8.6

## 46 GPUs

- NVIDIA: GTX 1080 Ti and A4000s

## 17,904 Processors

- AMD, Intel  
Massively Scalable  
and Parallel

524,762  
GigaFLOPS

- Very Fast Maximum  
Speeds

28,499,798 jobs  
submitted

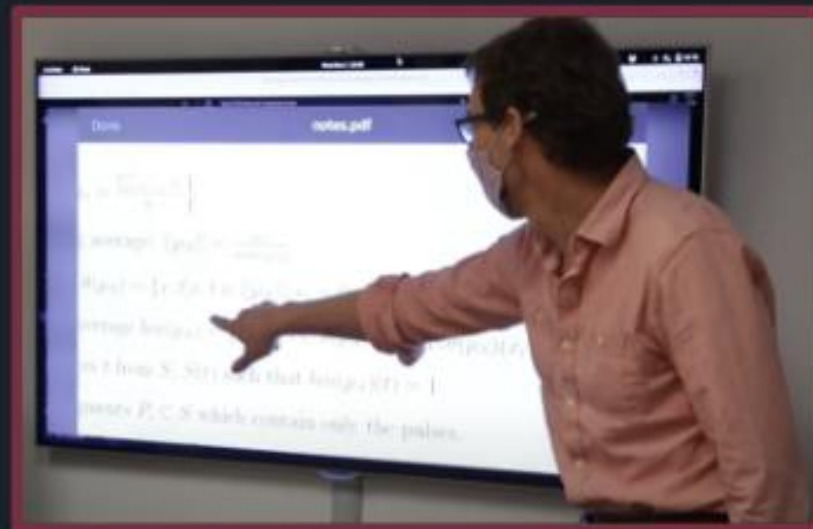
# RCC Education and Outreach



## Traditional Workshops

- Intro to HPC
- Intro to Linux
- Intro to R
- Intro to SLURM
- Python Bootcamp

## Instruction Types



## HSSA Workshops

- Intro to OpenRefine
- Intro to OCR/Tesseract
- Intro to IDHI

Most traditional workshops can be modified for HSSA workshops

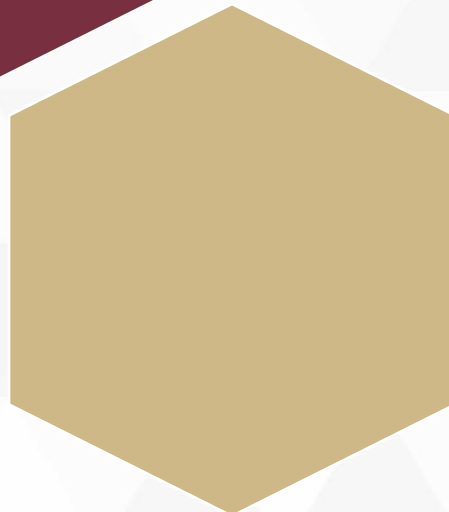
# The need for additional Research Instruction



Differing  
technical  
backgrounds

Discipline-specific  
instruction

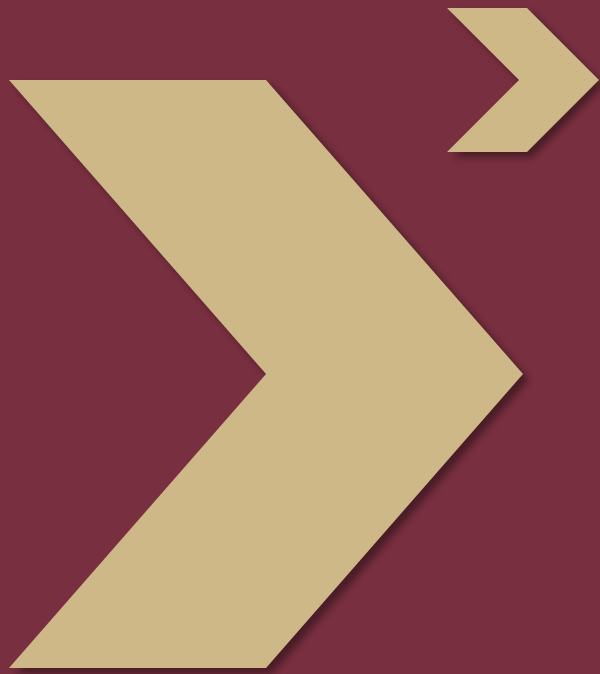
Increased  
classroom  
use



Reusable and staff-  
independent resources



# HPC Driver's Ed



High-Performance  
Computing at FSU  
with the Research  
Computing Center

# Goals of HPC Driver's Ed



- Developed for New HPC Users and asynchronous troubleshooting referrals
- A video guided introduction to High Performance Computing at FSU
- Increase educational offerings outside of our synchronous workshops offered every semester



# Convergence with Parallel Initiatives



- FSU General Events
- Specialized Humanities, Social Sciences, and Arts Instruction

INTERDISCIPLINARY  
DATA HUMANITIES  
INITIATIVE



FSU | EVENTS CALENDAR



## Intermediate Python Workshop

This workshop builds on fundamentals from our Python Bootcamp. We will cover intermediate Python topics for users that know Python basics and are interested...

🕒 3/21 3pm

📍 Stone Building (STB), STB 1301-E  
(Learning Resource Center)

📺 Stream Available

I'm Interested



## Python Bootcamp

We invite you to join RCC for a free, all-day, hands-on Python programming boot camp. Python is a programming language used across diverse tech industry...

🕒 3/28/2023 9am

📍 Stone Building (STB), STB 1301 E

📺 Stream Available

I'm Interested

# Project Stages



## Stage 1

- **Completed-** Creation of Educational Videos, Examinations, & Certification
- **Completed-** YouTube Deployment
- **Completed** –Webpage Deployment & Docs Linking

## Stage 2

- *In progress-*Development of Canvas Modules
- Outreach to Faculty, Research Staff, and Students
- Integration into Office of Research Available Resources

# Instructional Materials



- 2 hr + of Instructional Videos
- Provided code samples and appropriate documentation with each video

**HPC Driver's Ed**  
FSU Research Computing Center  
Public  
22 videos • 8 views • Last updated on Mar 8, 2024

Play all Shuffle

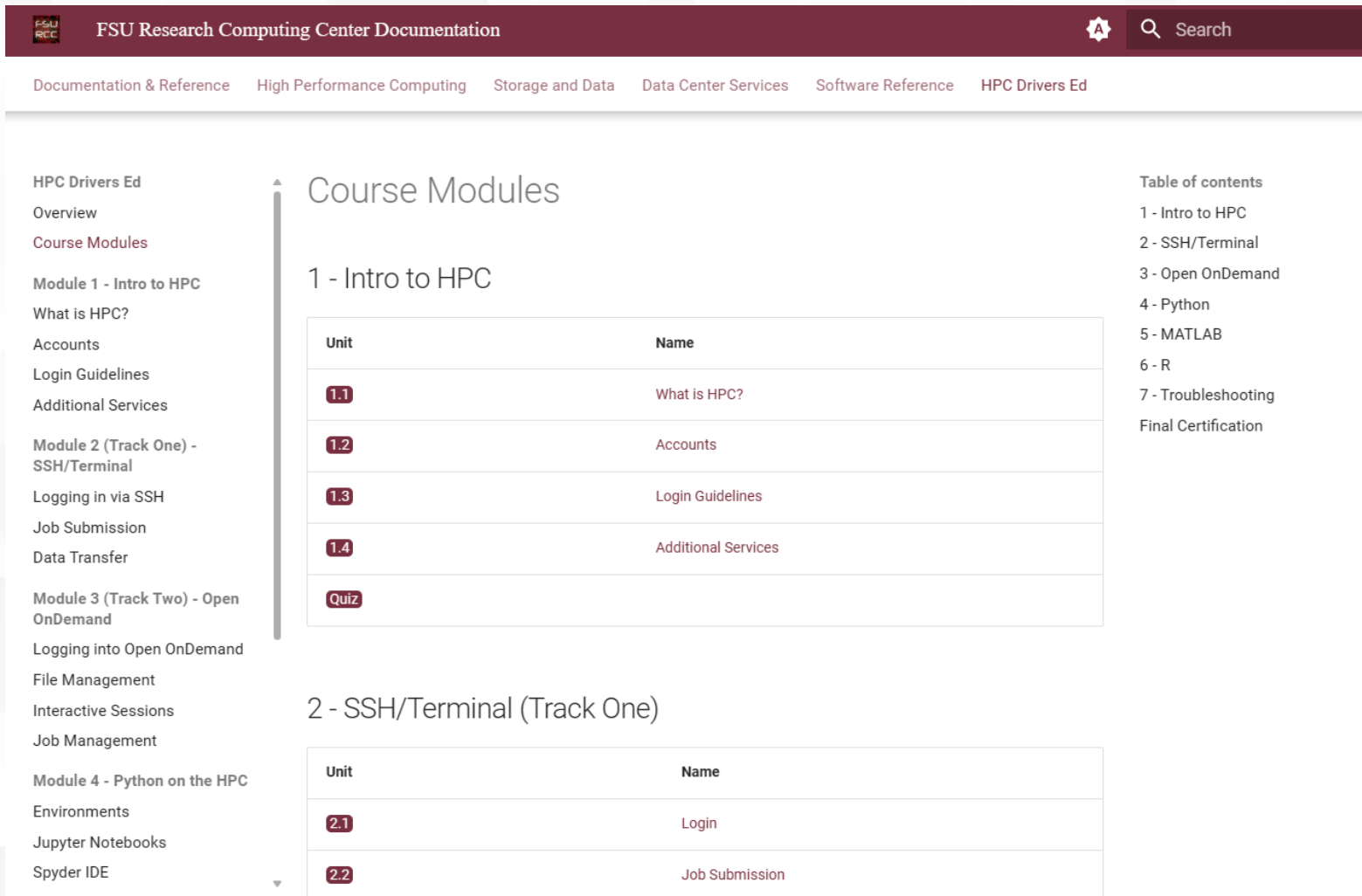
Collection of video tutorials on the use of High Performance Computing for Florida State University's Research Computing Center

Sort

- Overview of HPC Driver's Ed Course  
FSU Research Computing Center • 11 views • 3 weeks ago  
6:19
- 1-1 What is High Performance Computing?  
FSU Research Computing Center • 13 views • 3 weeks ago  
8:43
- 1-2 Accounts  
FSU Research Computing Center • 7 views • 3 weeks ago  
3:17
- 1-3 Login Guidelines  
FSU Research Computing Center • 4 views • 3 weeks ago  
3:48
- 1-4 Additional services  
FSU Research Computing Center • 12 views • 3 weeks ago  
8:35



# RCC Docs Structure



The screenshot displays the FSU Research Computing Center Documentation website. The header includes the FSU RCC logo, the site title, a search icon, and a search bar. A navigation menu lists various categories: Documentation & Reference, High Performance Computing, Storage and Data, Data Center Services, Software Reference, and HPC Drivers Ed. The main content area is titled 'Course Modules' and is divided into three sections: a left sidebar with a table of contents, a central main content area, and a right sidebar with a detailed table of contents. The main content area shows '1 - Intro to HPC' with a table of units and '2 - SSH/Terminal (Track One)' with a table of units.

FSU Research Computing Center Documentation

Documentation & Reference High Performance Computing Storage and Data Data Center Services Software Reference HPC Drivers Ed

HPC Drivers Ed  
Overview  
Course Modules  
Module 1 - Intro to HPC  
What is HPC?  
Accounts  
Login Guidelines  
Additional Services  
Module 2 (Track One) - SSH/Terminal  
Logging in via SSH  
Job Submission  
Data Transfer  
Module 3 (Track Two) - Open OnDemand  
Logging into Open OnDemand  
File Management  
Interactive Sessions  
Job Management  
Module 4 - Python on the HPC  
Environments  
Jupyter Notebooks  
Spyder IDE

## Course Modules

### 1 - Intro to HPC

Unit	Name
1.1	What is HPC?
1.2	Accounts
1.3	Login Guidelines
1.4	Additional Services
Quiz	

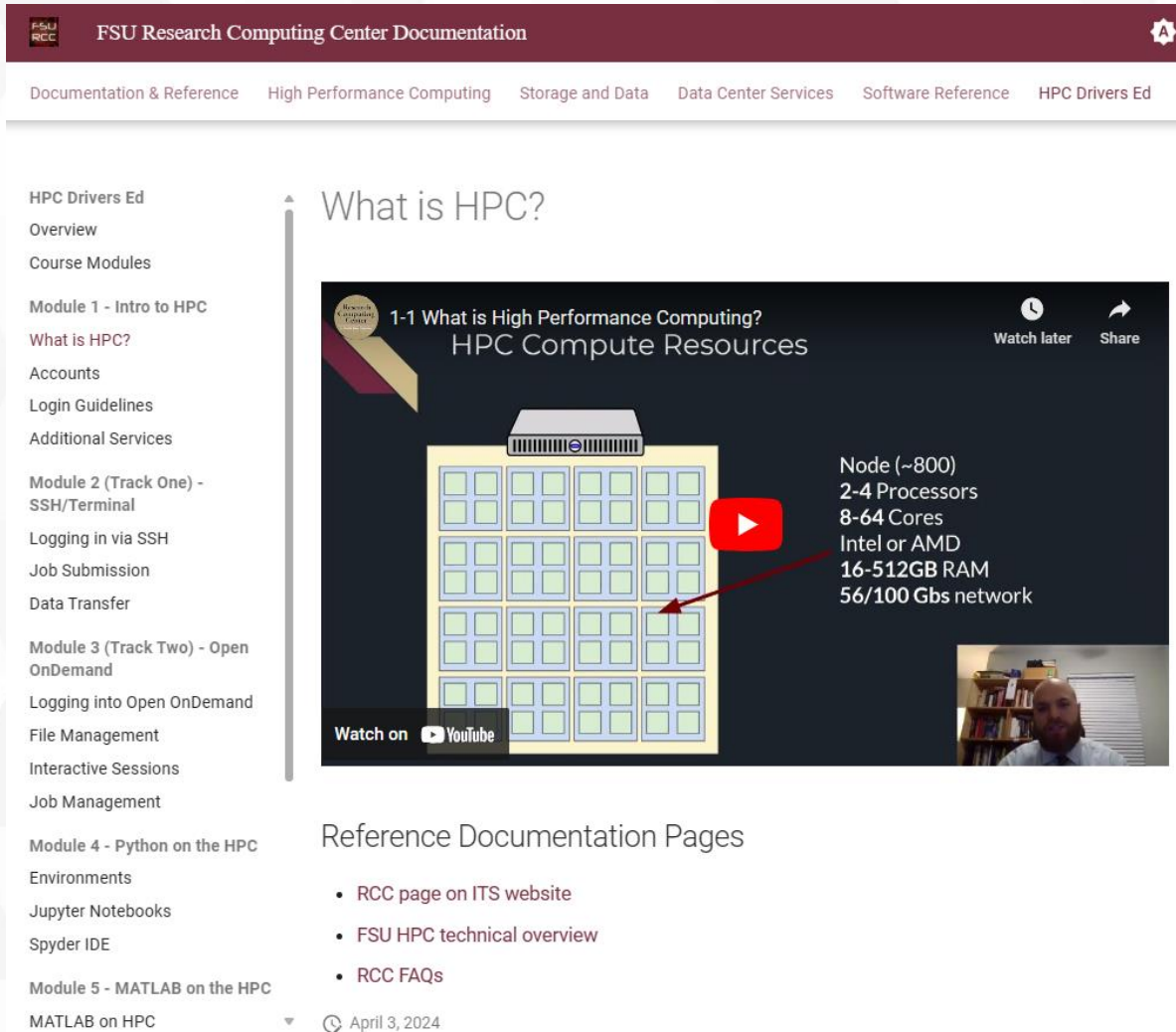
### 2 - SSH/Terminal (Track One)

Unit	Name
2.1	Login
2.2	Job Submission

### Table of contents

- 1 - Intro to HPC
- 2 - SSH/Terminal
- 3 - Open OnDemand
- 4 - Python
- 5 - MATLAB
- 6 - R
- 7 - Troubleshooting
- Final Certification

# Structure of Lectures



The screenshot shows the FSU Research Computing Center Documentation website. The header includes the FSU RCC logo and the text "FSU Research Computing Center Documentation". Below the header is a navigation bar with links for "Documentation & Reference", "High Performance Computing", "Storage and Data", "Data Center Services", "Software Reference", and "HPC Drivers Ed". The main content area is titled "What is HPC?" and features a video player. The video player shows a slide titled "1-1 What is High Performance Computing? HPC Compute Resources" with a list of specifications: "Node (~800)", "2-4 Processors", "8-64 Cores", "Intel or AMD", "16-512GB RAM", and "56/100 Gbs network". A red arrow points from the video player to the specifications. The sidebar menu on the left lists various topics, including "HPC Drivers Ed", "Module 1 - Intro to HPC", "Module 2 (Track One) - SSH/Terminal", "Module 3 (Track Two) - Open OnDemand", "Module 4 - Python on the HPC", and "Module 5 - MATLAB on the HPC".

FSU Research Computing Center Documentation

Documentation & Reference High Performance Computing Storage and Data Data Center Services Software Reference HPC Drivers Ed

HPC Drivers Ed  
Overview  
Course Modules

Module 1 - Intro to HPC  
What is HPC?  
Accounts  
Login Guidelines  
Additional Services

Module 2 (Track One) - SSH/Terminal  
Logging in via SSH  
Job Submission  
Data Transfer

Module 3 (Track Two) - Open OnDemand  
Logging into Open OnDemand  
File Management  
Interactive Sessions  
Job Management

Module 4 - Python on the HPC  
Environments  
Jupyter Notebooks  
Spyder IDE

Module 5 - MATLAB on the HPC  
MATLAB on HPC

## What is HPC?

1-1 What is High Performance Computing?  
HPC Compute Resources

Node (~800)  
2-4 Processors  
8-64 Cores  
Intel or AMD  
16-512GB RAM  
56/100 Gbs network

Watch on YouTube

Reference Documentation Pages

- RCC page on ITS website
- FSU HPC technical overview
- RCC FAQs

April 3, 2024

- Video
- Reference Links
- Related Modules

# Curriculum Development



Track 1	Track 2	Additional Modules
Designed for users that have Terminal/CLI experience	Targeted to all users that need to submit Interactive Jobs and/or have no CLI experience	Created for the specific high use softwares at FSU's RCC, namely: Python, R, and Matlab

# High Performance Compute Cluster

[Request This Service](#)[Report a Problem](#)[Search for Help](#)

## Overview

The FSU high performance computing (HPC) cluster is an integrated group of systems connected by an ultra-fast InfiniBand data network. The HPC, provided by the ITS Research Computing Center, is designed to run compute-intensive programs that require more memory and CPUs than an average computer can support. The HPC is ideal for distributed parallel computations, data processing and analysis and long-running batch computing jobs. Using the HPC, university researchers can process and analyze complex datasets and computationally intensive tasks, condensing weeks of work into days or hours.

# Research Computing Center

The Research Computing Center (RCC) at Florida State University enables research and education by maintaining a diverse campus cyberinfrastructure and providing training opportunities and dedicated consulting.

The RCC was one of the nation's first academic supercomputing ventures. Today, the RCC operates as an academic service unit of Information Technology Services. This unique partnership enables the RCC to leverage university IT infrastructure and places the RCC in a position to support groundbreaking research at FSU.

[RCC Account Login](#)[Research Services](#)[RCC Documentation](#)

# Docs Collections

## Articles

### How do I connect to the HPC from MobaXTerm on Windows?

46 Views • Jan 31, 2024 • Knowledge

### How do I connect to the HPC (or other RCC resources) from off-campus?

681 Views • Nov 6, 2023 • Knowledge

### How do I troubleshoot my RCC user account?

34 Views • Sep 22, 2023 • Knowledge

### How do I connect to Open OnDemand?

132 Views • Aug 25, 2023 • Knowledge

### How do I compile software on the High-Performance Computing Cluster?

138 Views • Aug 21, 2023 • Knowledge

### How do I request an RCC user account?

95 Views • Aug 21, 2023 • Knowledge

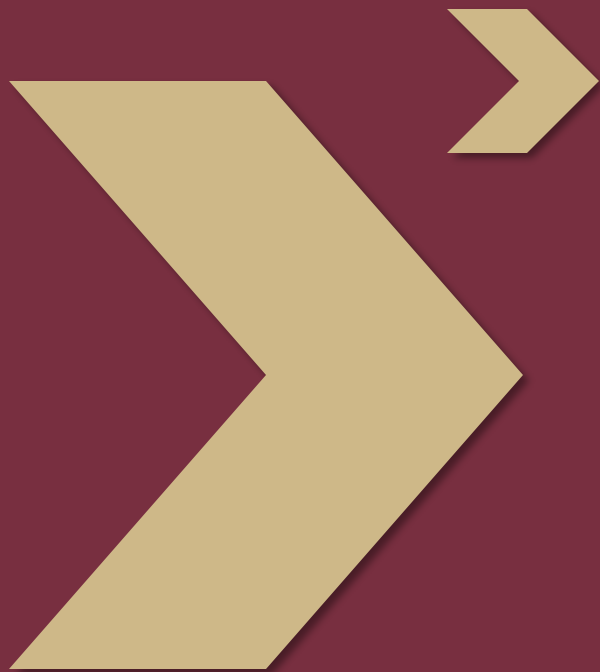
### How do I reset my RCC user account password?

44 Views • Aug 21, 2023 • Knowledge

### What do I do if I'm having trouble connecting to HPC (or other RCC resources)?










38 Views • Aug 18, 2023 • Knowledge

# Future Steps



Dashboard

Published Courses (4)

 <p>Egyptology 1001 EGPT 1001</p> 	 <p>Egyptology 1002: Advanced Studi... EGPT 1002</p>   
 <p>Orientation to Online Learning-001 TH0985</p>	 <p>PA 1234 - Klondike Gold Rush - H... PA 1234 - GOLD RUSH</p> 



# Canvas Deployment



1. By Module
2. By Course

The screenshot displays the Canvas LMS search interface. At the top, there is a navigation bar with the Florida State University logo, a search icon, and tabs for Search, Shared, Imported, Updates (0), and Favorites. A 'Guides' link is also present. Below the navigation bar, the search results are displayed. The search bar contains the text 'Search by title, name, institution or tag' and a search icon. To the right of the search bar, there is a dropdown menu set to 'Latest' and a 'Filter' button. Below the search bar, the text '272,285 results' is displayed. The search results are presented as a grid of four cards. Each card features a title, a description, and a 'FEATURED' badge. The first card is titled 'FEEDBACK MATTERS' and 'FSU Course Evaluation Module'. The second card is titled 'FSU EMERGENCY MODULE' and 'FSU Emergency Module'. The third card is titled 'FSU Flex Teaching' and 'FSU Flex Teaching Spring 2021'. The fourth card is titled 'Develop in Swift Explorations' and 'Develop in Swift Explorations, Xcode 15'. Each card also shows the number of downloads and stars.

Item Type	Title	Description	Downloads	Stars
MODULE	FEEDBACK MATTERS	FSU Course Evaluation Module	382	2
MODULE	FSU EMERGENCY MODULE	FSU Emergency Module	3.5k	49
MODULE	FSU Flex Teaching	FSU Flex Teaching Spring 2021	124	13
COURSE	Develop in Swift Explorations	Develop in Swift Explorations, Xcode 15	43	7

# Local Integration

- Link integration for:
  - ITS website
  - Office of Research
- Become a part of Required Researcher modules ( Module 1.1)

FSU | OFFICE OF RESEARCH

## Research Training & Resources

Welcome to the Office of Research's training/resources site. Here you'll find many helpful resources and trainings focused on the administration of sponsored projects at FSU. Please scroll down to see resources by topic. Or, use the Quick Links to the right to navigate to a listed resource.

### Faculty and Researcher

▼ **New to FSU research? Start here!**

› **Office of Research Development**

› **Finding Funding for Your Research**

› **Proposal Submissions and Grant Administration**

› **Human Subjects Research**

› **Office for Clinical Research Advancement**

› **Research Compliance & Conflict of Interest**

› **Research Integrity & Foreign Influence: A Quick Primer**

# International and National Integration



- HPC-ED National Catalog Inclusion
- Our course was designed to the HPC certification forum standards

**HPC Certification Forum**

**HPC ED**  
HPC-ED.GITHUB.IO



Thank you for attending!!

All questions or suggestions are  
welcome

