

TCOM 570

Network Automation

Spring 2023

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(Calls/Texts 9 AM – 5 PM EST Mon-Fri)

Office Hours: Immediately before class (Tuesdays 7:20PM, or by appointment)

Classes Meet: Tuesdays 7:20 PM - 10:00 PM, Instructional @ Peterson Hall, Room 2408. Some Synchronous virtual meetings may take place and the class will be notified prior to those class days.

Course Description: This is a project-based course that focuses on the process of automating the configuration, management, testing, and operation of physical and virtual devices within a network. Topics covered include: Introduction to Python, PyCharm and other IDE, Intro to Linux, Loops and conditions, Function, Class, string data/file manipulation, Python sockets, Logging, error handling, Regex, Pandas, Databases (SQLite3/mongodb), Paramiko/Netmiko, Flask and Graphing, Requests, API and web scrapping, Graphical User Interfaces, and Ansible for network automation.

Course Goals: This course will present students with the foundations of the use of Python and other scripting languages for network automation. The course builds upon the use of Python as the basic automation tool and introduces additional tools to guide students through the development and implementation of solutions for the tasks discussed, as well as course projects. Students will acquire the skills to develop their own Python scripts and network automation tools to enable new capabilities or to validate the results of existing tools.

Honor Code: - The Mason Honor Code is in effect <http://oai.gmu.edu/honor-code/masons-honor-code/>
Student members of the George Mason University community pledge not to cheat, plagiarize, steal, and/or lie in matters related to academic work.

Grading:

- 5 Homework/programming assignments
- 1 Paper
- 1 Final Project

Homework/programming assignments:	45%
Term Paper:	20%
Final Project:	30%
Class Participation	5%

Course assignments and projects:

Assignments and projects will be assigned during the class and are due at 8AM EST the following week. unless specified differently. Most information regarding the following weeks and assignments will be described in class. Project due dates are firm, as I will grade and discuss the projects in the subsequent class meetings.

Completeness:

You are expected to complete all assignments on time. Incomplete, late, or missing work may negatively affect your final grade.

Term Paper:

There will be one term paper for this course due on March 7th, midway point of the course. The topics are to be

discussed in class. However, there are no specific requirements on how wide or deep the contents should be. The paper should be use Times New Rome, Font 12, Line Space 1.5 and Margins 1.0' all around. The paper should have a cover page, table of contents, abstract and work/paper cited. The minimum content pages should be NO less than 10.

Final Exam:

Final score will be based on Final Project. Final Project can be individual or a group of a maximum of 2 students. Topics for the Final Project will be discussed during class.

Online Lectures: This class is expected to be in-class and in-person on campus, so unless you receive a message from me, the class will proceed, and your attendance at the class is expected. Meeting days are on Tuesdays at 7:20PM unless otherwise instructed.

Attendance Policy:

You are expected to be in each class, to participate, and to work on class-related tasks only. Unexcused absences or other issues will negatively affect your final grade.

Mason Calendar: https://registrar.gmu.edu/calendars/spring_2023/

The above link will provide you will Mason's important dates and deadlines regarding semester schedules..

Code Storage: A USB thumb drive or cloud storage is recommended to hold your code and data. The drive/space does not need to be large as most scripting and automation based items are fairly small in Byte size..

Personal Computer:

You may use your own computer for homework and projects. Some systems may have varying architectures so review your ability to utilize Virtual Machines on your personal systems.

Required Reading and Optional Material:**Required Texts (Kindle versions are available):**

[Mastering Python Networking: Your one-stop solution to using Python for network automation, programmability, and DevOps, 3rd Edition](#)

by Eric Chou, Michael Kennedy

ISBN-13 : 978-1839214677

Publisher - Packt Publishing

Edition – 3rd

[Python Scripting for Network Engineers: Realizing Network Automation for Reliable Networks](#)

by Wajid Hassan

ISBN-13: 978-1728791685

Publisher - Independently published

Edition – 1st

[Learn Python in One Day and Learn It Well \(2nd Edition\)](#)

ISBN-13: 978-1546488330

Publisher - Independently published

Edition – 2nd

Additional References (optional):

[Network Programmability and Automation: Skills for the Next-Generation Network Engineer](#)

by Jason Edelman, Scott S. Lowe
ISBN-13: 978-1491931257
Publisher – O'Reilly
Edition – 1st

Course Material: All course material is available on Mason Blackboard.

How do I get on Blackboard?

- Go to: <https://mymasonportal.gmu.edu/webapps/portal/frameset.jsp>
- Login with your Mason Credentials
- Click on the Courses tab
- Click on the TCOM-570-001 (Spring 2023)

How do I get to the online lectures (if necessary)?

- Follow instructions to login into Blackboard
- Click on **Tools**
- Click on **Blackboard Collaborate**
- You should see the current session listed
- Previously recorded sessions are accessed via the **Previously Recorded Tab**

In order for Blackboard to work properly, what do I need loaded on my computer?

- JAVA
- Quicktime
- Flash

Communication: All students must have a GMU email account and access to blackboard.gmu.edu. Please only use GMU email and BlackBoard for class-related communications. I will use one, the other, or both to communicate class-related information.

GMU Notice: The material provided in this course is proprietary. Uploading this material anywhere without the express permission of the instructor is strictly prohibited and a violation of the Mason Honor Code.

Office of Disability Services: Students with disabilities who seek accommodations in a course must be registered with the GMU Office of Disability Services (ODS) and inform the instructor, in writing, at the beginning of the semester. See <https://www2.gmu.edu/dpt/unilife/ods/> or call 703-993-2474 to access the ODS.

Course Schedule: The weekly course schedule will be provided on Blackboard and briefed weekly to ensure understanding of the requirements and expectations continuing through the course.

Final Note: I will make every effort not to adjust this syllabus, but I may do so if in the best interests of students and the learning objectives of the course. The schedules will be updated with the dates of last changes and all students will be notified via Blackboard and email of the update.