

**Class :** This course is completely online-async.  
Recordings for each week will be available on Wednesdays by 5:45PM.

We will stay engaged with each other using the following tools:

- Announcements on d2l
- Zoom Office Hours
- Flipgrid – a video discussion forum for weekly check-ins.
- D2l discussion forum in text
- Emails

It is highly recommended to subscribe to announcements and discussion forums to get latest information/discussion. Consider using Pulse app <https://resources.depaul.edu/teaching-commons/teaching-guides/technology/desire2learn/tools/more-tools/Pages/notifications.aspx>

**Instructor :** Dr. Anthony Chung  
**Office :** Online via Zoom (Link to join in d2l)  
**Office Hours :** MW 4:00-4:45 PM; Tu 3:00-3:45 PM; F 10:00-10:45 AM  
**Email :** [achung@depaul.edu](mailto:achung@depaul.edu)  
**Phone :** (312)-362-8724 (Note that I will not be on campus to pick up the phone.  
However you may leave a voicemail)

### IMPORTANT:

- **Email and Other Forms of Communications -**

While email is a great means of communication, increasingly we are bombarded with a volume of emails that is getting difficult to manage. In order to manage emails to better serve both the students and the professor. **Pay attention to ALL of the following:**

- **You MUST use the email account provided to you by DePaul (with depaul.edu domain). See this link for information and the advantages of using the account - <https://offices.depaul.edu/information-services/services/email/student-email/Pages/default.aspx>**
- **You MUST include NET384 or NET484 (depending on your class, and is case insensitive) in the subject line of the email as they will be directed to the appropriate mailbox where I check for emails related to this course.**
- I meet with students through Zoom, answer student emails, and respond to discussion forums etc **during my office hours**. In this way, you know exactly when you expect to hear from me by these means of communications. If you contact me close to the end of my office hours I may have to respond during the next office hours period. If you do not hear from me after two office hours periods, check to make sure that you

included NET484 or NET384 in the subject, email me again, or call to leave a message.

- I will be available through Zoom during the office hours. If I cannot make some office hours due to special circumstances, announcements will be made on d2l.

Depending on the complexity of your questions, **sometime we can get more out of meeting by Zoom interactively rather than by emails.**

- Given my response timeframe and office hours, you should **work on your assignments early so as to give yourself ample time to ask questions.**
- **Please observe the following email etiquette** so that we will be able to better focus our energy on learning and getting the most out of the class. It is also part of being professional. Some recruiters are abhorred at some of the emails received from recent recruits. It is important to form the good habit of writing appropriate emails in a professional setting.
  - Before sending questions via email or posting questions on the d2l discussion forum, make sure that your question is not already answered on the course syllabus, the d2l website (announcements, discussion forums, assignment information etc), or in the lecture recordings.
  - Questions that are of general interest to the entire class should be posted on the course discussion forum.
  - In addition to including NET484 or NET384 in the subject line, **be specific about the subject of the email in the mail subject heading and use proper spelling, grammar, and punctuation. DO NOT respond to an old email with a different subject when asking a new question.**
  - **Include your full name in the message body.**

While you have my permission to address me as Anthony or Tony, you should not assume that you could address other professors on a first name basis unless you have their explicit permissions.

**Course Home Page :** <https://d2l.depaul.edu> (Open on or before December 28, 2021)

**Prerequisites:** A programming course, and IT 263 for NET 384; or NET/TDC 413 for NET 484.  
**IMPORTANT NOTE:** it is not possible for the registration system to verify the programming course prereq. If you have never taken any programming or scripting courses please contact me ASAP.

**Optional Text:** Available through DePaul's ebooks library – O'Reilly for Higher

Education (Formerly Safari) - <https://go.oreilly.com/depaul/>

These are NOT required as most information can be easily found via the web. Some course materials are from these books.

- Ryan Tischer and Jason Gooley, **Programming and Automating Cisco Networks**, Cisco Press, (September 2016), ISBN: 9780134436777
- Jason Edelman, Scott Lowe, and Matt Oswalt, **Network Programmability and Automation: Skills for the Next-Generation Network Engineers**, O'Reilly, (February 2018), ISBN: 9781491931257

### **Course Description and Objective:**

This is a hands-on course on using scripts to develop practical applications for Network Management. Students will first learn the fundamentals of Linux operating system and script language(s) for task automation, and use scripts to develop dynamic web sites. After that, the course will cover Simple Network Management Protocol (SNMP), and use Application Programming Interface (API) to automate networks tasks of Fault Management, Configuration Management, Accounting Management, Performance Management, and Security Management (FCAPS). The final project of the course is to develop a dynamic web site with the above five functional areas to manage Linux servers, Ethernet switches and IP routers.

### **Learning Outcomes:**

After this course you should be able to:

- Identify network management tasks that are suitable for automation.
- Apply scripting to perform the function of auto discovery of active network elements.
- Apply scripting to collect data from syslog and identify security risks and account activities.
- Use different approaches (CLI, telnet, SNMP, etc.) to perform network management functions.
- Apply SNMP API to read/write configuration data (and traps) and conduct network management functions on Ethernet switches and IP routers.
- Develop a web site to perform network management functions.
- Use 3<sup>rd</sup> party tools (e.g., the MRTG) to conduct performance analysis and generate time series graphs.

**Grading**

<b>HW01</b>	<b>5%</b>
<b>HW02-08 (10% each)</b>	<b>70%</b>
<b>Project</b>	<b>15%</b>
<b>Class Participation</b>	<b>20%</b>

**Note:** These add up to 110% but the final total grade will be capped at 100%.

A	93-100%
A-	90-92%
B+	85-89%
B	80-84%
B-	75-79%
C+	70-74%
C	65-69%
C-	60-64%
D	50-59%
F	< 50%

**Notes:**

- **Changes to Syllabus:** This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted under Announcements in D2L.
- **Penalty for late assignments:**
  - **Participation Quizzes: No late submissions**
  - **HW:**
    - **After the due time: -20%**
    - **After one day: -50%**
    - **After two days: -100%**
  - **Project: No late submission.**

**All due dates and time are given in the submission boxes.** Please check the schedule and be sure of the due dates. You must use the homework submission system (drop box) through d2l. **If there are problems with the submission system, you should email me a copy of the assignment BEFORE the due time.**

- **About Class Participation**
  - a. Viewing of recorded lectures is required.

- b. Weekly video check-ins on flipgrid (see the welcoming announcement on d2l for details).
- c. For every lecture module there will be a **participation quiz**. The questions will be on the “in class” exercises and certain points that we emphasized in the lectures and the recordings. Students are allowed to take the quiz **up to 10 times** before the quiz is due and the **highest** score will be used towards the final grade. To do well in the quiz you are recommended to
  - i. Take notes while viewing the lectures, especially on points not in the slides but are filled in within the lecture videos, and points where I emphasize that students should write down.
  - ii. When an “in class” exercise is given, students should work through the exercise before checking solutions.
  - iii. Make sure that you get the answers of the in class exercises. Some quiz questions will be on the in class exercises.
- d. Failure to do a and/or b, above will result in lowering of the participation points irrespective of the participation quiz score.

Here’s a link from Columbia about the importance of note taking (and resources)  
<https://www.cc-seas.columbia.edu/node/31875>

Although you can choose to take notes using computer or by hand, here’s an article on recent research showing the advantage of taking notes by hand.  
<http://www.npr.org/2016/04/17/474525392/attention-students-put-your-laptops-away>

- Any grading questions **must be directed to me within 1 week of the posting of the grade. No grade adjustments will be made more than a week after the grade is posted. You should email me with the following information:**
  - **The assignment**
  - **The problem in question**
  - **Why you think you should get a grade rather than the one given.**
  
- Please check DePaul’s academic calendar  
<https://academics.depaul.edu/calendar/Pages/default.aspx> for important dates such as last day to add/drop/withdraw from classes.
  
- **Make sure that you read and understand DePaul’s academic integrity policy:**  
[https://offices.depaul.edu/academic-affairs/faculty-resources/academic-integrity/Documents/Academic%20Integrity%20Policy\\_Spring%202016.pdf](https://offices.depaul.edu/academic-affairs/faculty-resources/academic-integrity/Documents/Academic%20Integrity%20Policy_Spring%202016.pdf)

**For additional resources concerning academic integrity, please check here:**  
<http://academicintegrity.depaul.edu/Resources/index.html>

- **All assignments are individual assignments.** You should not work so close with another student as to produce solutions that are identical or almost identical.
- **Sharing your work with other students, in or out of this class, is also a violation of academic integrity (called “complicity”).** While you are encouraged to help fellow students understand course materials, you should not help them with individual assignments. If you want to help, encourage them to ask questions about what they do not understand in the course materials presented, rather than asking questions directly about the assignment.
- **Under no circumstances should you copy or use simple paraphrasing of someone else's work, including course materials and lecture slides, without giving proper credits and references.**
- **Please be aware that any written work (assignments and exams) submitted in this course may be verified using *Turn-It-In* technology in order to ensure that the work is the student's own creation and not in violation of the University's Academic Integrity Policy. Submission of work in this course constitutes a pledge that the work is original and consent to have the work submitted to verify that fact.**
- Publicly sharing or posting online any prior or current materials from this course is a violation of DePaul's academic integrity:

All students are expected to abide by the University's Academic Integrity Policy which prohibits cheating and other misconduct in student coursework. Publicly sharing or posting online any prior or current materials from this course (including exam questions or answers), is considered to be providing unauthorized assistance prohibited by the policy. Both students who share/post and students who access or use such materials are considered to be cheating under the Policy and will be subject to sanctions for violations of Academic Integrity.

- **Respect for Diversity and Inclusion at DePaul University as aligned with our Vincentian Values:** At DePaul, our mission calls us to explore “what must be done” in order to respect the inherent dignity and identity of each human person. We value diversity because it is part of our history, our traditions and our future. We see diversity as an asset and a strength that adds to the richness of classroom learning. In my course, I

strive to include diverse perspectives and teaching pedagogies. I also encourage open dialogue and spaces for students to express their unique identities and perspectives. I am open to having difficult conversations and I will strive to create an inclusive classroom that values all perspectives. If at any time, the classroom experience does not live up to this expectation, please feel free to contact me via email or during office hours.

- **Student Attitude:** A professional and academic attitude is expected throughout this course. Measurable examples of non-academic or unprofessional attitude include but are not limited to: talking to others when the instructor is speaking, mocking another's opinion, cell phones ringing, emailing, texting or using the internet whether on a phone or computer. If any issues arise a student may be asked to leave the classroom. The professor will work with the Dean of Students Office to navigate such student issues.
- **Civil Discourse:** DePaul University is a community that thrives on open discourse that challenges students, both intellectually and personally, to be Socially Responsible Leaders. It is the expectation that all dialogue in this course is civil and respectful of the dignity of each student. Any instances of disrespect or hostility can jeopardize a student's ability to be successful in the course. The professor will partner with the Dean of Students Office to assist in managing such issues.

### Schedule (Tentative):

**Note: All assignments are due on Wednesdays at 11:59pm.**

Week: Date	Topic	Assignments
1: 1-5	Course Introduction <ul style="list-style-type: none"> <li>• Scripting for Network Automation</li> <li>• Linux System Administration</li> <li>• Linux Command Primer</li> <li>• HTML Primer</li> <li>• Editing</li> </ul>	
2: 1-12	Introduction to Linux Shell Programming <ul style="list-style-type: none"> <li>• Scripting vs. Programming</li> <li>• Shell Data Structures</li> <li>• Shell Control Structures</li> <li>• Network Probing and Auto Discovery</li> </ul>	<b>Non-graded assignments due (Academic integrity pledge, and self-introduction)</b>  <b>HW01 Due</b>  <b>Week 1 participation and video check-in due</b>
3: 1-19	Introduction to Python (Basics) <ul style="list-style-type: none"> <li>• Syslog analysis</li> <li>• Intrusion detection</li> </ul>	<b>HW02 Due</b>  <b>Week 2 participation and video check-in due</b>

4: 1-26	Python (II) <ul style="list-style-type: none"> <li>• Using “Tables” for problem solving</li> <li>• Time API</li> <li>• Accounting Management</li> </ul>	<b>HW03 Due</b>  <b>Week 3 participation and video check-in due</b>
5: 2-2	Python API and Dynamic Web Development <ul style="list-style-type: none"> <li>• HTML and Web Development</li> <li>• Web Administration</li> <li>• Performance measurement</li> </ul>	<b>HW04 Due</b>  <b>Week 4 participation and video check-in due</b>
6: 2-9	Network Management and SNMP <ul style="list-style-type: none"> <li>• telnet scripting (Shell)</li> <li>• Command encapsulation in Python</li> </ul>	<b>HW05 Due</b>  <b>Week 5 participation and video check-in due</b>
7: 2-16	Network Configuration Management <ul style="list-style-type: none"> <li>• Python SNMP API</li> </ul>	<b>HW06 due</b>  <b>Week 6 participation and video check-in due</b>
8: 2-23	Network Performance Management <ul style="list-style-type: none"> <li>• Traffic measurement</li> <li>• MRTG</li> </ul>	<b>HW07 due</b>  <b>Week 7 participation and video check-in due</b>
9: 3-2	Network Fault Management <ul style="list-style-type: none"> <li>• SNMP Trap</li> <li>• Final Project Requirements</li> <li>• Regular Expression</li> </ul>	<b>HW08 due</b>  <b>Week 8 participation and video check-in due</b>
10: 3-9	Course Wrap Up <ul style="list-style-type: none"> <li>• Database and MySQL</li> <li>• Final Project Q&amp;A</li> </ul>	<b>Week 9 participation and video check-in due</b>
11: 3-16	<b>No Class</b>	<b>Final Project due</b>  <b>Week 10 participation and video check-in due</b>

### Online Instructor Evaluation

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student’s identity. Since 100% participation is our goal, students are sent periodic reminders over two weeks. Students do not receive reminders once they complete the evaluation.

**Email**

Email is the primary means of communication between faculty and students enrolled in this course outside of class time. Students should be sure their email listed under "demographic information" at <http://campusconnect.depaul.edu> is correct.

**Academic Integrity Policy**

This course will be subject to the faculty council rules on the [Academic Integrity Policy](#)

**Plagiarism**

The university and school policy on plagiarism can be summarized as follows: Students in this course, as well as all other courses in which independent research or writing play a vital part in the course requirements, should be aware of the strong sanctions that can be imposed against someone guilty of plagiarism. If proven, a charge of plagiarism could result in an automatic F in the course and possible expulsion. The strongest of sanctions will be imposed on anyone who submits as his/her own work a report, examination paper, computer file, lab report, or other assignment which has been prepared by someone else. If you have any questions or doubts about what plagiarism entails or how to properly acknowledge source materials be sure to consult the instructor.

**Respect for Diversity and Inclusion at DePaul University as aligned with our Vincentian Values**

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**Incomplete**

An incomplete grade is given only for an exceptional reason such as a death in the family, a serious illness, etc. Any such reason must be documented. Any incomplete request must be made at least two weeks before the final, and approved by the Dean of the College of Computing and Digital Media. Any consequences resulting from a poor grade for the course will not be considered as valid reasons for such a request.

**Students with Disabilities**

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential.

To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at:

Student Center, LPC, Suite #370

Phone number: (773)325.1677

Fax: (773)325.3720

TTY: (773)325.7296

Last updated: Dec 20, 2021