IT4100 - File Systems and Storage Technologies

Fall 2019 Syllabus

Classic, virtualized, and cloud storage will be covered. Topics such as RAID, NAS, SAN will be covered. Business continuity for backup and replication of storage. Local vs. Remote file systems. We will explore older and newer OS filesystems and compare them (such as fat32, ntfs, ext3, ext4, btrfs).

Prerequisites: IT3100 should have been completed with a C- or better.

Course fee: The fee for this course is $20.00, used to assist in maintaining the CIT infrastructure.

Course Time: MWF 12:00 - 12:50 (SCC 108)

Final Exam: Mon, Apr 29 11:00 - 12:50.

Professor: Dr Joe Francom

- Email: francom at dixie dot edu
- Phone: 435-652-7732 (note: email preferred)
- Office: NBURNS 237
- Office Hours: See Below

Joe’s Fall 2019 Schedule

<table>
<thead>
<tr>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>MWF</td>
<td>8am - 9:00 - By appointment only</td>
</tr>
<tr>
<td>MWF</td>
<td>9am - 10:00 - Office</td>
</tr>
<tr>
<td>MWF</td>
<td>10am-10:50 - IT1100 (113)</td>
</tr>
<tr>
<td>MWF</td>
<td>11am-11:50 - IT3100 (117)</td>
</tr>
<tr>
<td>MWF</td>
<td>12pm-12:50 - IT4200 (113)</td>
</tr>
<tr>
<td>MWF</td>
<td>1pm-1:50 - Office</td>
</tr>
<tr>
<td>MWF</td>
<td>2pm-2:50 - IT3300 (107)</td>
</tr>
</tbody>
</table>

Objectives

At the end of the course, students will be able to:

- Evaluate key filesystems technologies (both local and remote) and implement these filesystems.
- Evaluate storage architectures and key data center elements in classic, virtualized, and cloud environments
- Explain physical and logical components of a storage infrastructure including storage subsystems, RAID, and intelligent storage systems
- Articulate business continuity solutions backup and replication, and archive for managing fixed content
- Mirror disk images, clone a hard drive, partition

Resources

Texts

There is no required text for this course.

There are several links and other readings given throughout the course.

Computer Resources

Each student should have their own laptop, but you may use the computers in the general lab area in the Smith Computer Center. There will also be lab assistants in these labs. You will also have access to virtual machines to complete most of the tasks.
Course Website

This course has an accompanying website. You are responsible for announcements, the schedule, and other resources posted on the website. Assignments and grades will be managed using Canvas, which requires a valid Dixie username and password. The course website is accessible at [http://cit.cs.dixie.edu/courses/](http://cit.cs.dixie.edu/courses/).

Assignments and Exams

Reading

The student is responsible for reading the material in the textbook. A reading schedule is provided with the class schedule on the course website. The student is expected to read the material before the class in which it is discussed. The book also includes material beyond what we will discuss in lecture, which you are encouraged to study on your own. Feel free to bring questions from the reading to lectures or to office hours.

Assignments

It is important that you start early and get each of your assignments done before its due date. Many problems will take much longer to solve in a single sitting than in many shorter sessions. Give yourself time to think; sleep on difficult problems. Finish early so you can go back and refine your initial approach.

Assignments are due on the date listed in the schedule, and must be submitted according to instructions. Your instructor will tell you how to appropriately submit assignments.

Exams

There will be several exams given throughout the semester. Any missed tests will need to have the Divisional Dean’s approval before you can take the test.

Grading

Projects and exams each contribute to your point total.

The breakdown for the above items is as follows:

- Projects = 50%
- Tests = 50%

Here is the grading scale:

<table>
<thead>
<tr>
<th>Points</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 94</td>
<td>A</td>
</tr>
<tr>
<td>&gt;= 90</td>
<td>A-</td>
</tr>
<tr>
<td>&gt;= 87</td>
<td>B+</td>
</tr>
<tr>
<td>&gt;= 84</td>
<td>B</td>
</tr>
<tr>
<td>&gt;= 80</td>
<td>B-</td>
</tr>
<tr>
<td>&gt;= 77</td>
<td>C+</td>
</tr>
<tr>
<td>&gt;= 74</td>
<td>C</td>
</tr>
<tr>
<td>&gt;= 70</td>
<td>C-</td>
</tr>
<tr>
<td>&gt;= 67</td>
<td>D+</td>
</tr>
<tr>
<td>&gt;= 64</td>
<td>D</td>
</tr>
<tr>
<td>&lt;  64</td>
<td>F</td>
</tr>
</tbody>
</table>

Course Policies

Absences

Students are responsible for material covered and announcements made in class. School-related absences may be made up only if prior arrangements are made. The class schedule presented is approximate. The instructor reserves the right to modify the schedule according to class needs. Changes will be announced in class and posted to the website. Exams and quizzes cannot be made up unless arrangements are made prior to the scheduled time.

Time
Courses should require about 45 hours of work per credit hour of class. This class will require about 135 hours of work on the part of the student to achieve a passing grade, which is approximately 9 hours per week. If you do not have the time to spend on this course, you should probably rethink your schedule.

**Late work**

Late work is not accepted. You are expected to turn things in by the date they are due. If something is due at 11:59pm and you are 1 minute late, you will not receive credit. Your lowest assignment score will be dropped.

Any exceptions must be discussed with the instructor. Computer failure does not qualify as an excuse for late work.

It is your responsibility to see that assignments/projects are turned in and on time. If you come to me and say, “I turned in that assignment”, yet I have no record of it, you will receive a 0. The burden of proof is on you to prove that you turned in something at a given time. We are using an electronic submission system which records when a item is submitted.

Finally, no points can be contested after a test which covers that assigned material has been given. So for example, if you come to me at the end of the semester and say “Oh, but I turned in that assignment the second week of the semester”. If I don’t have a record of it, and we have already tested on it, you will not get the points.

**Cheating and Collaboration**

Limited collaboration with other students in the course is permitted. Students may seek help learning concepts and developing programming skills from whatever sources they have available, and are encouraged to do so. Collaboration on assignments, however, must be confined to course instructors, lab assistants, and other students in the course. Students are free to discuss strategies for solving programming assignments with each other, but this must not extend to the level of programming code. Each student must code his/her own solution to each assignment.

Cheating will not be tolerated, and will result in a failing grade for the students involved as well as possible disciplinary action from the college. Cheating includes, but is not limited to, turning in homework assignments that are not the student’s own work. It is okay to seek help from others and from reference materials, but only if you learn the material. As a general rule, if you cannot delete your assignment, start over, and re-create it successfully without further help, then your homework is not considered your own work.

You are encouraged to work in groups while studying for tests, discussing class lectures, discussing algorithms for homework solutions, and helping each other identify errors in your homework solutions. If you are unsure if collaboration is appropriate, contact the instructor. Also, note exactly what you did. If your actions are determined to be inappropriate, the response will be much more favorable if you are honest and complete in your disclosure.

Where collaboration is permitted, each student must still create and type in his/her own solution. Any kind of copying and pasting is not okay. If you need help understanding concepts, get it from the instructor or fellow classmates, but never copy another’s code or written work, either electronically or visually. The line between collaborating and cheating is generally one of language: talking about solutions in English or other natural languages is usually okay, while discussions that take place in programming languages are usually not okay. It is a good idea to wait a while after any discussion to start your independent write-up. This will help you commit what you have learned to long-term memory as well as help to avoid crossing the line to cheating.

**College Policies**

Click on this link - [http://academics.dixie.edu/syllabus/](http://academics.dixie.edu/syllabus/) - for comprehensive information on the Semester Dates, the Final Exam Schedule, university resources such as the library, Disability Resource Center, IT Student Help Desk, Online Writing Lab, Testing Center, Tutoring Center, and Writing Center. In addition, please review DSU policies and statements with regards to Academic Integrity, Disruptive Behavior and Absences related to university functions.

If you are a student with a medical, psychological, or learning disability or think you might have a disability and would like accommodations, contact the Disability Resource Center (652-7516) in the Student Services Center. The Disability Resource Center will determine eligibility of the student requesting special services and determine the appropriate accommodations related to their disability.
Important Links

- Disability Resource Center - dixie.edu/drcenter
- IT Help Desk - dixie.edu/helpdesk
- Library - library.dixie.edu
- Testing Center - dixie.edu/testing
- Tutoring Center - dixie.edu/tutoring
- Writing Center - dixiewritingcenter.com