**CSCI.258 - Introduction to Operating Systems Using UNIX online**

**(Previous number: 63.258)**

**(Online – Summer 2016 – Section C0A)**

**(In an online course: NO classroom lectures and face-to-face meetings)**

**All communication is through email** [skrishnamoorthy@framingham.edu](mailto:skrishnamoorthy@framingham.edu)

**Syllabus**

**Instructor** : Dr. Krishnamoorthy (Dr. Krishna)

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Feel free to contact me whether it is regarding this course including project, advising, computer science program, or other matters where I could be of help to you.

**Catalog Description**

An introduction to the basics of networking and operating systems. Topics include the evolution and overview of operating systems, operating system principles, interfaces (GUI, command line, and API), command processors and utilities, file system, access control, processes, programming and scripting, user account and authentication, OSI model and Internet protocol, networking utilities, net computing, client-server model, FTP, and network file systems. The UNIXTM operating system is used as a primary reference for illustration and hands-on experience.

**Required Textbook**

Your UNIX/Linux: The Ultimate Guide, Third Edition

By Sumitabha Das

McGraw Hill, 2013

ISBN: 978-0073376202

**OR**

Your UNIX: The Ultimate Guide, Second Edition

By Sumitabha Das

McGraw Hill, 2006

ISBN: 978-0072520422

Note: Chapter numbers varies between third edition and second edition. These differences are indicated at appropriate places.

**References**

Numerous texts books are available on UNIX operating system. A sample list of books covering various aspects of UNIX is provided below for your reference.

1. UNIX: the textbook, Second Edition, by Syed M. Sarwar, Robert Koretsky, Syed A. Sarwar, Pearson, Addition Wesley, 2005.
2. Just Enough UNIX, Fourth Edition, by Paul K. Anderson, McGraw Hill, 2003.
3. UNIX User’s Handbook, Second Edition, Marty Poniatowski, Prentice Hall PTR, 2002.
4. Student Guide to UNIX, Second Edition, by H. Halin, McGraw Hill, 1996.
5. Introduction to UNIX, by G. Meghabghab, Que E&T, 1996.
6. A practical guide to UNIX system, Third Edition, Mark Sobell, Benjamin/Cummings Publishing Company, 1995.
7. UNIX for the Impatient, by P.W. Abrahams, and B.R. Larson, Addison Wesley, 1993
8. UNIX Operating System, Third Edition, by K. Christian, and S. Richter, John Wiley & Sons, 1994.
9. UNIX System Administration Handbook, Third Edition, by Evi Nemeth, Garth Snyder, Scott Seebass, and Trent R. Hein, Prentice Hall, 2001.
10. The Art of UNIX Programming, by Eric S. Raymond, Addition Wesley, 2004.
11. UNIX for Programmers and Users, Third Edition, by Graham Glass and King Ables, Pearson Education, 2003.
12. UNIX Systems Programming, by Kay A. Robbins and Steven Robbins, Prentice hall PTR, 2003.
13. UNIX System Programming, Second Edition, by K. Haviland, D. Gray, and B. Salama, Addison Wesley, 1999.
14. UNIX Network Programming: Interprocess Communications, Vol. 2, Second Edition, by W.R. Stevens, Prentice Hall, 1999.
15. C and UNIX Tools for Software, by M.L. Barrett,and C.H. Wagner, John Wiley & Sons, 1996.
16. LINUX Shell Script Programming, by Todd Meadoors, Thomson Course Technology, 2003.
17. Guide to UNIX using Linux, by Jack Dent and Tony Goddis, Thomson Course Technology, 2000.
18. LINUX User’s Resource, by James Mohr, Prentice Hall PTR, 1998.
19. Spring into Technical Writing for Engineers and Scientists, by Barry Rosenberg, Addison-Wesley, 2005.

**Prerequisites**

**Prerequisite by Topics:** Must have experience in the following topics:

* Understanding of various hardware and software components of a computer
* Experience writing programs, compiling and running
* Knowledge and experience using Microsoft Office productivity tools such as Word and PowerPoint
* Experience using web tools for web and library catalog search
* Knowledge of using Blackboard

**Prerequisite by Course:** You must have taken 63.152 Computer Science I

**Course Assessment**

The following assessment will be used in the course.

**Quizzes (450 points = 45%)**

There will be several quizzes in the course. The number of quizzes, topics covered and the dates are shown in the schedule section of the syllabus later.

Quizzes must be taken using Blackboard. Quizzes must be taken in the assigned dates. Consequently, you are advised to plan things in advance to avoid any possible conflicts.

See the schedule table at the end of the syllabus for quiz dates.

**For in-class lecture based course:** Makeup date will be given only in the case of emergency or serious illness. In this case, the student must inform the instructor before the start of the scheduled exam date to get makeup date. If you happen to fall ill, then doctor note must be produced.

Questions for the tests will come from the materials in the textbook materials covered in the specified chapters in the textbook and homework. For lecture based classes, questions will come from the materials covered in the class also.

**For lecture based in-class Course:** Every effort will be made to cover all the subjects/chapters needed for a quiz as stated in the syllabus schedule. However, there is no guarantee that the subjects/chapters for all questions appearing in a quiz will be covered in the class before the quiz date when the course is held in a classroom environment. Students must develop self-learning skill, which every employer expects from their employees. This is the best time to develop this skill.

**Homework (450 points = 45%)**

There will be series of homework. Homework must be done using the UNIX server system, which is available over the Internet from outside the college. Completed homework must be emailed to the instructor on or before the specified due date. Refer to the homework section of the course information for details about homework.

Due dates for homework are given in the schedule section of the syllabus.

**Naming Your Homework File**

Name each of your homework file that you submit as follows:

**Last name – hw# part#**

Replace # by appropriate number; for homework it will be homework number and for part it will be part number. If there are multiple parts in a homework, then use “part#” otherwise omit it.

For example, homework#1 has two parts and others have only one part. Assuming I am submitting my homework, I will name my files as, “Krishna – hw1 part1”, “Krishna – hw1 part2”, “Krishna – hw4”, “Krishna – hw4”, “Krishna – hw4”.

**Late Homework**

For late assignments, you will lose points at the rate of 5% per day. Homework, which is five days late will lose 25% of the points.

No homework will be accepted after five days from the due date.

**Final Project (100 points = 10%)**

The project involves two parts: (1) written report in MS Word and (2) PowerPoint slide preparation.

Each student must search and identify an operating system or operating system related topic. Submit the topic to the instructor and get it approved. Collect materials on the approved topic, read the materials, write a report in Word according to the given document layout guidelines and prepare a PowerPoint slide presentation. The written report should be between 3 to 5 pages (all inclusive), single spaced using New Times Roman font with size 12.

A list of possible topics is given in the assignment section of the course on blackboard for your help. You can select one of these topics or you can propose a topic of your own that is not in the list.

The PowerPoint slides and the written report should be emailed to the instructor on or before the due date.

**Extra Credit Points (50 points = 5%)**

To make up for any issues with quiz questions, 50 extra credit points are given beyond 1000 points (=100%). You have to earn these points by participating in all the discussion board forums such as syllabus forum, project forum and chapter question forums.

These 50 points make up more than any issues that may be identified and it helps to get better grade in the quizzes and in the course.

**Discussion Board Forums**

There will be discussion board forums on syllabus, projects and on each chapter. Everyone must participate in it. Everyone must answer ONE question completely (all parts in the question) from the textbook in each chapter that was not already answered by another student through discussion board forum as you read the book. **No two students can answer the same question**. Points are given at the end of the semester for participation. Your points will be proportional to the level of your participation. See discussion board for details.

**Grading**

**In order to pass the course one must do the homework AND take quizzes AND receive points as shown below. One cannot pass the course by taking quizzes and doing project alone. In the same way, one cannot pass the course by doing homework and project alone.**

You could receive a maximum of 1050 points for the course including extra credit points. Your final letter grade for the course depends on how many points you earn out of these points. The letter grade will be assigned as shown below:

**Grade** **Points**

A 950 to 1050

A- 900 to 949

B+ 870 to 899

B 830 to 869

B- 800 to 829

C+ 770 to 799

C 730 to 769

C- 700 to 729

D+ 670 to 699

D 630 to 669

D- 600 to 629

F Less than 600

Note: Grade F is a fail grade.

Grading is absolute grading. As you can see there is a 6% scaling (1060 points instead of 1000 points) built in the grading scheme, which you have to earn by participating in the discussion board forums. There will be no further scaling. Your grade depends only on the total points you get. It does not depend on how other students perform in the class.

Please do not ask or argue with the instructor at the end of the semester about getting more than the above points even if you are less by one point to get the next grade level. It will not be given.

**Academic Honesty Policy - Conduct**

Students must do their work by themselves. **Plagiarism in any form including copying in the quizzes and homework, copying and pasting information from Internet and other sources will result in the F (fail) grade. Students can discuss problems with each other. However, when time comes to do the work, it must be done by individual student separately. You cannot copy another student’s work. The person who copies and the person who allowed copying both will be penalized and fail the course. Two or more people cannot submit the same work stating, “We worked together”. Knowledge is power. It rewards in workplace and in personal life. Do the work yourself, learn and enjoy.**

You can refer to the academic honesty policy in the Undergraduate Catalog under the Student Conduct section (<http://www.framingham.edu/undergraduate-catalogs/documents/1011/academic-regulations.pdf>) or page 7 in the Graduate Catalog at <http://www.framingham.edu/graduate-and-continuing-education/documents/grad-catalog-0910.pdf>

**Course Credit Hour**

This course meets weekly for a total of 3 hours and 20 minutes and is worth 4 credit hours. Most of the work due to successfully complete this course will have to be executed outside of class time, for each hour of work performed inside the class meeting time students are expected to work a minimum of two hours outside of class on assigned problems and/or readings in preparation for class.

**Hours of Work required outside Class**

At FSU 4 courses are considered full-time student load in a semester. Assuming 40 hours of work per week, this translates to 10 hours per course per week out of which 4 hours are to attend the class. **Each student is expected to work for the remaining 6 hours a week outside the class per course.** Some students may require more time and few may require less time**. This course will likely require more than 6 hours of work outside class.**  Devote enough time to read the textbook and to do the homework and project and to get good grade.

**Accommodation Statement for Special Needs Students**

Framingham State University offers equal opportunities to all qualified students, including those with disabilities and impairments. The University is committed to making reasonable accommodations as are necessary to ensure that its programs and activities do not discriminate, or have the effect of discriminating, on the basis of disability. Academic Support serves students with learning and psychiatric disabilities as well as students with visual, mobility and hearing impairments. For further information about this, please visit the website at <http://www.framingham.edu/center-for-academic-support-and-advising/disability-services/index.html> or contact Ms. LaDonna Bridges, Director of Academic Support/Disability Services, in the Center for Academic Support and Advising (CASA) at 508-626-4906 or [lbridges@framingham.edu](mailto:lbridges@framingham.edu).

**U.S. Copyright Law**

This course website may contain copyrighted materials that are used in compliance with the U.S. Copyright Law. Under that law, materials may not be saved to your computer, revised, copied, or distributed without permission. They are to be used in support of instructional activity as part of this course only and shall be limited to the duration of the course, unless otherwise specified by the instructor or owner of the material. You may only download or print materials at the direction of your instructor who knows which materials are copyrighted and which are not.

**Major Topics Covered**

This course is an introductory course in operating system and networking using UNIX. The following topics are covered:

* Evolution of operating systems and history of UNIX operating systems
* User Interfaces (GUI, Command Line and Scripting, API)
* UNIX Commands (Utilities) and Command Processors
* Vi Editor
* UNIX File Structure and Access Control
* Processes
* Programming Tools, Scripting (Shell Programming)
* Networking OSI Model, Internet Protocols
* UNIX Networking Utilities, Net Computing, Client-server model, and FTP
* UNIX System Administration: User Accounts, Authentication, Security and Social issues, and Backup and Restore
* Virtual Machine (optional)

**Chapters not covered from the textbook:**

* The GNU emacs Editor
* Ch. 12 Filtering and Programming with awk
* Ch. 14 (or Ch. 15) Perl – The Master Manipulator

**Recommended Reading:** It is highly recommended that you readChapter 15 Introducing C in the third edition.

**List of Materials on Blackboard**

You will find the following items on blackboard.

|  |  |
| --- | --- |
| **Section Name** | **Content** |
| Announcement | Course announcement from instructor |
| Syllabus | Course syllabus. You are reading it now. |
| Contacts | Information to contact and communicate with instructor |
| Discussion Board | List of forums on syllabus, chapter forums and others |
| Assignments | Descriptions of all homework to be done |
| Quizzes | List of quizzes to be taken |
| Course Documents | Contains PowerPoint slides, login information, information on transferring file from UNIX server to laptop (PC), etc. |

There are additional items on blackboard such as tools, grade information, etc. Please take a look them.

**Accessing UNIX server**

UNIX server is available both inside the campus and outside the campus. To access the server, you need the IP address of the server given below and PuTTY software installed on your computer. PuTTY gives secure connection between your computer and the server. It is free software available on the Internet for download. It is already loaded on the college General Lab systems in Hemenway Hall. You must downloadPuTTY on your system using the link below right after finish reading this syllabus.

In addition, you also need your username and password account information to login to the UNIX server. These are given in the assignment section on blackboard. Also, the procedure to login is also given in the assignment section. Login and make sure that you can access the server. Send email to the instructor, if you have trouble logging to the server. Also, contact the college Help Desk located in Hemenway Hall. You can also call them.

**UNIX Server IP Addresses:**

Within the campus: 192.168.200.230

Outside the campus: 134.241.37.230

**PuTTY Link:**

<http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>

**UNIX Account:** Information on your UNIX username and password will be given in the first class.

**Course Schedule**

The table below shows the course schedule for the semester.

**Chapter numbers in red are for Second edition only. For example, the material on “Shell” is in Ch. 6 in 3rd edition and the same is in Ch. 7 in the 2nd edition.**

Depending on the edition you have, read the appropriate chapter for a topic.

|  |  |  |  |
| --- | --- | --- | --- |
| **Week /**  **Start date** | **Items to Read from your textbook** | **Homework due date** | **Quiz date** |
| 1 -  5/24 | Ch. 1 Introducing UNIX,  Ch. 2 Becoming Familiar with UNIX commands and  Ch. 5 Vi Editor |  |  |
| 2 -  5/31 | Ch. 3 The File System and  Ch.4 File Attributes, and  Prepare for quiz#1 |  |  |
| 3 -  6/7 | Ch. 6 (or Ch. 7) The Shell and  Ch. 8 (or Ch. 9) Customizing the Environment | Homework #1:  6/7 | Quiz #1 on: Ch. 1, 2, 3, and 5  Opens: 6/7  Ends: 6/13 |
| 4 -  6/14 | Ch. 7 (or Ch. 8) Process and  Ch. 18 System Prog. II-Process Control |  |  |
| 5 -  6/21 | Ch. 9 (or Ch. 10) Simple Filters and Ch. 10 (or Ch. 11) Filters using Regular Expressions: grep command.  Prepare for Quiz #2 |  |  |
| 6 -  6/28 | Ch. 13 Shell programming | Homework #2 due  6/28 | Quiz#2 on: 4, 6 (7), 7 (8), and 8 (9)  Opens: 6/28  Ends: 7/4 |
| 7 -  7/5 | Ch. 16 Program Development Tools, Ch. 17 Systems Prog. I-Files |  |  |
| 8 –  7/12 | Ch. 11 (or Ch. 14) Networking Tools |  |  |
| 9 -  7/19 | Ch. 19 System administration, security, backup and restore | Homework #3 due  7/19  Email project topic due:  7/19 | Quiz #3 on: 9 (10), 11, 13, 17, 18  Opens: 7/19  Ends: 7/25 |
| 10 -  7/26 | Project report and PP slides, and  Prepare for Quiz#4  **Last day to answer chapter questions: 7/26** |  | Discussion board forum closes 7/26 |
| 11 -  8/2 |  | Project report and PP slides due  8/2 | Quiz #4 on: 11 (14),16, 19  Opens: 8/2  Ends: 8/8 |
| 12 –  8/9 | **Semester ends on 8/4** |  | Quiz #4 on: 11 (14),16, 19  Opens: 8/2  Ends: 8/8 |

**Course Outcomes**

On completion of this course, students should have acquired the following knowledge and skills:

1. Understanding of basic principles of operating systems including file system, processes, utilities and interfaces
2. Experience working with UNIX operating system to solve problems
3. Writing ability to create a technical document and presentation materials for oral presentation to a range of audiences.
4. An ability to search and identify an operating system topic for research and self-learning
5. Ability to use computing tools such as web search tools, Microsoft Word and PowerPoint

**Course Outcomes and Program Outcomes**

The table below shows the mapping of the above course outcomes to the CS program outcomes. Only the letters representing the CS program outcomes are given in the table. The descriptions of the program outcomes are available on blackboard in the syllabus section for your reference.

S = Strong coverage, M = Moderate coverage, F = Fair coverage, N/Blank = No coverage

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course Outcomes | Program Outcomes | | | | | | | | | | |
| a | b | c | d | E | f | g | H | i | j | k |
| 1 | S |  | M |  | F |  |  |  | S |  |  |
| 2 | S |  | M |  | F |  |  |  | S |  |  |
| 3 |  |  |  |  |  | M |  |  |  |  |  |
| 4 | F |  |  |  |  |  |  |  | F |  |  |
| 5 |  |  |  |  |  |  |  |  | M |  |  |

|  |  |
| --- | --- |
| Dept. of Computer Science | Course No. CSCI.258 |
| Semester Hours: 4 | Course Coordinator: Prof. Suban Krishnamoorthy |

**Computer Science Program Outcomes**

The following is the list of computer science program outcomes.

**General Objectives**

1. An ability to apply knowledge of computing and mathematics appropriate to the discipline
2. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
3. An ability to design, implement, and evaluate a computer-based system, process, component or program to meet desired needs
4. An ability to function effectively on teams to accomplish a common goal
5. An understanding of professional, ethical, legal, security and social issues and responsibilities
6. An ability to communicate effectively with a range of audiences
7. An ability to analyze the local and global impact of computing on individuals, organizations, and society
8. Recognition of the need for and an ability to engage in continuing professional development
9. An ability to use current techniques, skills, and tools necessary for computing practices
10. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices
11. An ability to apply design and development principles in the construction of software systems of varying complexity

**Discussion Board Entry**

Go to discussion board and make an entry in the syllabus forum NOW. Remember that it carries points.

**End of Syllabus**