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Senado Académico
Secretaría

CERTIFICACIÓN NÚM. 16-2016-2017

Yo, Arnaldo Rodríguez Rivera, secretario ejecutivo del Senado Académico de la Universidad de Puerto Rico en Bayamón, **CERTIFICO QUE**:

> El Senado Académico, en reunión ordinaria celebrada el 15 de septiembre de 2016, aprobó el curso *COTI 4270 – Administración de Sistemas Operativos* sometido por los departamentos de Ciencias de Computadoras y Electrónica.

Y PARA QUE ASÍ CONSTE, expido la presente certificación en Bayamón, Puerto Rico, hoy 26 de septiembre de 2016.

Arnaldo Rodríguez Rivera
Secretario Ejecutivo

Vo.Bo. Margarita Fernández Zavala
Rectora

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OFFICE OF THE DEAN OF ACADEMIC AFFAIRS
Department of Computer Science

SYLLABUS

A. TITLE OF COURSE	:	**OPERATING SYSTEMS ADMINISTRATION**
B. CODIFICATION	:	COTI 4270
C. CREDITS	:	3 credits; 3 contact hours per week
D. PRE-REQUISITES	:	COTI 3102
E. COURSE DESCRIPTION	:	This course provides hands-on skills and the knowledge necessary to manage operating systems in a server environment. Topics covered include directory services, server management, file and print services, and user account administration. Students will learn how to administer a fully functional operating system.

F. OBJECTIVES :

At the end of the course the student will be able to:

1. Administer an operating system
2. Use the command line
3. Create user accounts and manage groups
4. Understand, describe and know how to handle different file systems.
5. Use command, tools and utilities, including networking utilities.
6. Manage processes by stopping and prioritizing them
7. Code basic scripts.
8. Use the features of different shells
9. Schedule jobs.

G. COURSE OUTLINE :

TOPIC	***HOURS***
1. Introduction to server operating systems	3 hours

a. What is an operating system?
b. What are the most common operating system for servers
c. OS Components: kernel, file system, shell, utilities, memory manager
d. History of Unix and Windows Server
e. Other server operating systems
f. Open and closed source operating systems
g. Introduction to virtualization
h. Operating system installation

2. System administration theory — 6 hours
    a. Responsibilities of the system administrator and super user
    b. Starting and stopping the server
    c. Account management
    d. Maintaining groups
    e. Monitoring disk space
    f. Backing up and restoring data
    g. Scheduling jobs

3. Basic commands — 4 hours
    a. Logging in
    b. Shell prompts
    c. Utilities and commands
    d. Setting/changing the passwords
    e. Listing users online
    f. Viewing and displaying environmental variables
    g. Date and time management
    h. NTP and clock synchronization
    i. Viewing the contents of a file
    j. Logging out

4. File systems — 3 hours
    a. File systems
    b. Cross platform file system
    c. Mounting local and remote file systems
    d. Directory structures
    e. Absolute and relative pathnames (shortcuts)
    f. Permissions on file
    g. Path names
    h. Creating and traversing directories
    i. Copying and moving files
    j. Creating hard and soft links
    k. Searching files on multiple file systems

5. Process management — 5 hours
    a. What is a process?
    b. Process states
    c. Characteristics of process
    d. Parent and child processes
    e. Foreground and background processes
    f. What is a terminate and state resident process (daemons)
    g. Viewing process status
    h. Killing processes
    i. Setting the priority of a process

6. The shell — 6 hours
    a. What is the shell?
    b. Command line
    c. Redirection
    d. Wildcards, pipes, tees
    e. Regular expressions

7. Print services — 3 hours
    a. Print management

8. Bash shell programming/scripting — 9 hours
    a. What is a script?
    b. User-defined and environment variables
    c. Arithmetic expression
    d. Conditional expression
    e. Control structures
    f. Termination and exit codes
    g. Breaking a command's output
    h. User-defined functions
    i. Debugging shell scripts
    j. Arithmetic and conditional expressions
    k. Arrays
    l. Shell scripting for administrators

9. Exams and quizzes — 6 hours

H. INSTRUCTIONAL STRATEGIES

Lectures and hands-on workshops, project based learning: scripts and program development, command line practice.

I. MINIMUM SETUP AND LEARNING RESOURCES

Computer with administrator access to a server operating system

J.EVALUATION CRITERIA

Project	25%
Homework	15%
Quizzes	25%
In Class-Work	35%
	100%

K. ADA AND P.R. LAW #51 POLICY STATEMENT

The UPRB accomplish with Section 504 of the Vocational Rehabilitation Act of 1973, the ADA (American with Disabilities Act) of 1990 and its amendment in 2008, 51 Law of 1996 (Servicios Educativos Integrales para Personas con Impedimentos) and 238 Law of August 31, 2004 (Carta de Derechos de las Personas con Impedimentos) and its amendments in 2008 and 2009 in order to guarantee equality in education and services access. Any student who feels s/he may need an accommodation based on the impact of a disability must visit the Office of Disability Services, located on the first floor of the Students Center, next to the cafeteria, to discuss his/her specific needs and provide written documentation. At the request of the student, the Office of Disability Services will prepare an individualized letter for each professor. This letter certifies that the student has a disability and provides reasonable accommodations required by the student to obtain an adequate academic achievement. A request for reasonable accommodation does not exempt a student from complying with the academic requirements of their program of study.

L. ACADEMIC INTEGRITY

The University of Puerto Rico promotes the highest standards of academic and scientific integrity. Article 6.2 of the Student General Bylaw of the UPR (Certification Num. 13, 2009-2010 the Board of Trustees) states that "academic dishonesty includes, but is not limited to: fraudulent actions, obtaining grades or academic degrees by making false or fraudulent simulations, copy all or part of academic work of another person, plagiarize whole or in part the work of another person, totally or partially copy someone else's answers to questions in tests, making or getting someone else to take on behalf of any test or oral examination or writing and facilitate assistance or for another person incurred in the aforementioned conduct. " Any of these actions will be subject to disciplinary actions in accordance with the procedure on the Students General Bylaw of the UPR.

M. GRADING SYSTEM : Standard curve

100 - 90 A
89 - 80 B
79 - 70 C
69 - 60 D
59 - 0 F

N. REFERENCES :

Textbook:

S. Das, *Your UNIX/LINUX*. New York: McGraw-Hill, 2013. ISBN-13: 978-0073376202, ISBN-10: 0073376205

Other references:

R. Blum and C. Bresnahan, *Linux command line and shell scripting bible*, 3rd ed. John & Wiley and Sons, 2015. ISBN-13: 978-1118983843, ISBN-10: 111898384X

C. Easttom and S. Palladino, *Essential Linux administration*. Boston, MA: Course Technology/Cengage Learning, 2012. ISBN-13: 978-1435459564, ISBN-10: 1435453563

C. Johnson and J. Varma, *Pro bash programming*. Apress. 2nd ed. 2015. ISBN-13: 978-1484201220, ISBN-10: 1484201221

T. Limoncelli, C. Hogan and S. Chalup, *The practice of system and network administration*. Upper Saddle River, NJ: Addison-Wesley, 2007. ISBN-13: 978-0321492661, ISBN-10: 0321492668

E. Nemeth, G. Snyder and B. Whaley, *UNIX and Linux system administration handbook*, 4th ed. Upper Saddle River, NJ: Pearson Learning, 2011. ISBN-13: 978-0131480056, ISBN-10: 0131480057

A. Robbins, *Sed & awk pocket reference*. Beijing: O'Reilly & Associates, 2000. ISBN-13: 978-1565027292, ISBN-10: 156592729X

Electronic references:

The Linux Documentation Project, 2016.Available: http://www.tldp.org.

Linux Journal | The Original Magazine of the Linux Community, 2016. Available: http://www.linuxjournal.com.

M. Cooper. *Advanced Bash-Scripting Guide*, 10th ed. 2016. Available: http://www.tldp.org/LDP/abs/abs-guide.pdf

W. Heuser. *Linux on the Road*, 2016 Available: http://www.tldp.org/LDP/Mobile-Guide/Mobile-Guide.pdf

L. Wirzenius, J. Oja, S. Staffor and A. Weeks. *The Linux System Administration's Guide*, 10th ed. 2004. Available: http://www.tldp.org/LDP/sag/sag.pdf

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