Program Information Report

Linux/UNIX Systems (CTLUX)

Certificate

Program Effective Term: Fall 2014

This program introduces students to the Linux and UNIX operating systems and prepares them to safely run their own home servers.

Articulation:
Eastern Michigan University, BS degree.

Copies can be obtained from the Counseling Office, a program advisor, or from the Curriculum and Assessment Office Web site: www.wccnet.edu/departments/curriculum/articulation.php?levelone=colleges.

Program Admission Requirements:
Completion of a CIS (above CIS 100), CPS, or CSS course, or permission of instructor.

Major/Area Requirements		(16 credits)
CIS 121	Linux/UNIX I: Fundamentals	4
CIS 206	Linux/UNIX II: Basic System Administration, Networking, and Security	4
CIS 208	Linux/UNIX III: Intermediate System Administration, Networking, and Security	4
CIS 221	Linux/UNIX Programming and Scripting I	4

Minimum Credits Required for the Program: **16**

Notes:

The following sequence of courses is recommended. Please check course descriptions for pre and co-requisites:

I
CIS 121

II
CIS 206
CIS 208
CIS 221

WASHTENAW COMMUNITY COLLEGE

PROGRAM CHANGE OR DISCONTINUATION FORM

Program Code: CTLUX

Program Name: Linux/UNIX Systems

Effective Term: Fall 2014

Division Code: BCT

Department: Computer Information Systems

Directions:

1. Attach the current program listing from the WCC catalog or Web site and indicate any changes to be made.
2. Draw lines through any text that should be deleted and write in additions. Extensive narrative changes can be included on a separate sheet.
3. Check the boxes below for each type of change being proposed. Changes to courses, discontinuing a course, or adding new courses as part of the proposed program change, must be approved separately using a Master Syllabus form, but should be submitted at the same time as the program change form.

Requested Changes:

- ☐ Review
- ☐ Remove course(s): _____
- ☐ Add course(s): _____
- ☒ Program title (title was Linux/UNIX Systems I)
- ☐ Description
- ☐ Type of award
- ☐ Advisors
- ☐ Articulation information
- ☐ Program admission requirements
- ☐ Continuing eligibility requirements
- ☐ Program outcomes
- ☐ Accreditation information
- ☐ Discontinuation (attach program discontinuation plan that includes transition of students and timetable for phasing out courses)
- ☒ Other credit & contact hours

Show all changes on the attached page from the catalog.

Rationale for proposed changes or discontinuation:

Program change resulting from increase in the credit and contact hours for program courses.

Financial/staffing/equipment/space implications:

List departments that have been consulted regarding their use of this program.

CIS

Signatures:

Reviewer	Print Name	Signature	Date
Initiator	Philip Geyer	Philip Geyer	1-8-14
Department Chair	John Trame	John Trame	1/8/14
Division Dean/Administrator	Rosemary Wilson	Rosemary Wilson	1/24/14
Vice President for Instruction	Bill Abernethy		

Do not write in shaded area.
Entered in: Banner_____ **C&A Database** 1/27/14 **Log File** 1/27/14 jr

Please submit completed form to the Office of Curriculum and Assessment.

jr done
logged 1/13/14 sj

Linux/UNIX Systems I (CTLUX1)

Certificate

2011 - 2012 2012 - 2013 2013 - 2014

Description

This program introduces students to the Linux and UNIX operating systems and prepares them to safely run their own home servers.

Articulation

Eastern Michigan University, BS degree.

Copies can be obtained from the Counseling Office, a program advisor, or from the Curriculum and Assessment Office Web site: www.wccnet.edu/departments/curriculum/articulation.php?levelone=colleges.

Admissions Requirements

Completion of a CIS (above CIS 100), CPS, or CSS course, or permission of instructor.

Contact Information

Division: Business/Computer Technologies
Department: Computer Instruction Dept
Advisors: Michael Galea, Philip Geyer

Requirements

Major/Area Requirements

Class	Title	Credits
CIS 121	Linux/UNIX I: Fundamentals	~~0~~ 4
CIS 206	Linux/UNIX II: Basic System Administration, Networking, and Security	~~3~~ 4
CIS 208	Linux/UNIX III: Intermediate System Administration, Networking, and Security	~~3~~ 4
CIS 221	Linux/UNIX Programming and Scripting I	~~3~~ 4
Total		~~12~~ 16
	Total Credits Required:	~~12~~ 16

› *Gainful Employment Disclosures*

Footnotes

The following sequence of courses is recommended. Please check course descriptions for pre and co-requisites:

I II
CIS 121 CIS 206
CIS 208
CIS 221

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Program Information Report

Linux/UNIX Systems I (CTLUX1)

Certificate

Program Effective Term: Fall 2014

This certificate helps prepare students to complete the Linux+ and LPIC-1 industry certifications. Linux is a popular Web server, file server and database hosting platform and is commonly used in everything from mobile computing devices to large scale data center environments and supercomputers.

Articulation:
Eastern Michigan University, BS degree.

Copies can be obtained from the Counseling Office, a program advisor, or from the Curriculum and Assessment Office Web site: http://www.wccnet.edu/departments/curriculum/articulation.php?levelone=colleges.

Program Admission Requirements:
Completion of a CIS (above CIS 100), CPS, or CSS course, or permission of instructor.

Major/Area Requirements		(13 credits)
CIS 121	Linux/UNIX I: Fundamentals	4
CIS 206	Linux/UNIX II: Basic System Administration, Networking, and Security	3
CIS 208	Linux/UNIX III: Intermediate System Administration, Networking, and Security	3
CIS 221	Linux/UNIX Programming and Scripting I	3

Minimum Credits Required for the Program: **13**

Notes:

The following sequence of courses is recommended. Please check course descriptions for pre and co-requisites:

I	*II*
CIS 121	*CIS 206*
	CIS 208
	CIS 221

WASHTENAW COMMUNITY COLLEGE

PROGRAM CHANGE OR DISCONTINUATION FORM

Program Code: CTLUX1 **Program Name:** Linux/UNIX Systems 1 **Effective Term:** ~~Winter 2014~~ FALL 2014

Division Code: BCT **Department:** CIS

Directions:

1. Attach the current program listing from the WCC catalog or Web site and indicate any changes to be made.
2. Draw lines through any text that should be deleted and write in additions. Extensive narrative changes can be included on a separate sheet.
3. Check the boxes below for each type of change being proposed. Changes to courses, discontinuing a course, or adding new courses as part of the proposed program change, must be approved separately using a Master Syllabus form, but should be submitted at the same time as the program change form.

Requested Changes:

- ☐ Review
- ☐ Remove course(s): _____
- ☐ Add course(s): _____
- ☐ Program title (title was _____)
- ☒ Description
- ☐ Type of award
- ☐ Advisors
- ☐ Articulation information
- ☐ Program admission requirements
- ☐ Continuing eligibility requirements
- ☐ Program outcomes
- ☐ Accreditation information
- ☐ Discontinuation (attach program discontinuation plan that includes transition of students and timetable for phasing out courses)
- ☐ Other _____

Show all changes on the attached page from the catalog.

Rationale for proposed changes or discontinuation:

More accurate description

Financial/staffing/equipment/space implications:

None

List departments that have been consulted regarding their use of this program.

CIS

Signatures:

Reviewer	Print Name	Signature	Date
Initiator	Philip Geyer	Philip Geyer	10-18-13
Department Chair	Philip Geyer	Philip Geyer	10-18-13
Division Dean/Administrator	Rosemary Wilson	Rosemary Wilson	10/22/13
Vice President for Instruction	Wm. Abernethy		11/11/13
President	N/A		

Do not write in shaded area. Entered in: Banner_____ C&A Database 11/14 Log File 11/14/13 Board Approval _____

Please submit completed form to the Office of Curriculum and Assessment and email an electronic copy to sjohn@wccnet.edu for posting on the website.

gl done
logged 10/24/13 sjv

Linux/UNIX Systems I (CTLUX1) Certificate
Program Effective Term:

This program introduces students to the Linux and UNIX operating systems and prepares them to safely run their own home servers.

See attached sheet.

Articulation

Eastern Michigan University, BS degree.

Admission Requirments

Completion of a CIS (above CIS 100), CPS, or CSS course, or permission of instructor.

Continuing Eligibility

Major/Area Requirements

CIS 121	Linux/UNIX I: Fundamentals	4
CIS 206	Linux/UNIX II: Basic System Administration, Networking, and Security	3
CIS 208	Linux/UNIX III: Intermediate System Administration, Networking, and Security	3
CIS 221	Linux/UNIX Programming and Scripting I	3

The following sequence of courses is recommended. Please check course descriptions for pre and co-requisites:

semester I: CIS 121
semester II: CIS 206, CIS 208, CIS 221

Minimum Credits Required for the Program **13**

commonly used

Linux is a popular web server, file server and database hosting platform and is ~~common~~ in everything from mobile computing devices to large scale data center environments and supercomputers. This certificate helps prepare students to complete the Linux+ and LPIC-1 industry certifications.

first letter

WASHTENAW COMMUNITY COLLEGE

PROGRAM CHANGE OR DISCONTINUATION FORM

2080

Program Code: ~~CTUNX~~ CTLUX1 **Program Name:** Linux/UNIX Systems I **Effective Term: Fall 2006**

Division Code: BCT **Department:** CIS

Directions:

1. Attach the current program listing from the WCC catalog or Web site and indicate any changes to be made.
2. Draw lines through any text that should be deleted and write in additions. Extensive narrative changes can be included on a separate sheet.
3. Check the boxes below for each type of change being proposed. Changes to courses, discontinuing a course, or adding new courses as part of the proposed program change, must be approved separately using a Master Syllabus form, but should be submitted at the same time as the program change form.

Requested Changes:

- ☐ Review
- ☒ Remove course(s): CIS 286
- ☒ Add course(s): CIS 206 and CIS 208
- ☒ Program title (title was Unix Systems)
- ☒ Description
- ☐ Type of award
- ☐ Advisors
- ☐ Articulation information
- ☐ Program admission requirements
- ☐ Continuing eligibility requirements
- ☐ Program outcomes
- ☐ Accreditation information
- ☐ Discontinuation (attach program discontinuation plan that includes transition of students and timetable for phasing out courses)
- ☐ Other

Show all changes on the attached page from the catalog.

Rationale for proposed changes or discontinuation:

Updating program and courses to meet current needs

Financial/staffing/equipment/space implications:

None

List departments that have been consulted regarding their use of this program.

CIS

Signatures:

Reviewer	Print Name	Signature	Date
Initiator	Philip Geyer	Philip J Geyer	3-13-06
Department Chair	Philip Geyer	Philip J Geyer	3-13-06
Division Dean/Administrator	Rosemary Wilson	Rosemary Wilson	3/23/06
Vice President for Instruction	Roger Palay	Roger Palay	4/11/06

Do not write in shaded area. Entered in: Banner ____ C&A Database 4/11 Log File 3/24/06 SJ 4/11

Please submit completed form to the Office of Curriculum and Assessment and email an electronic copy to sjohn@wccnet.edu for posting on the website.

Computer Systems

Linux/UNIX Systems I (CTLUX1)
Certificate

Program Effective Term: Fall 2006

This program introduces students to the Linux and UNIX operating systems and prepares them to safely run their own home servers.

Program Admission Requirements:
Completion of a CIS (above CIS 100), CPS, or CSS course, or permission of instructor.

Major/Area Requirements		**(12 credits)**
CIS 121	Linux/UNIX Fundamentals I	3
CIS 206	Linux/UNIX II: Basic System Administration, Networking, and Security	3
CIS 208	Linux/UNIX III: Intermediate System Administration, Networking, and Security	3
CIS 221	Linux/UNIX Programming and Scripting I	3

Minimum Credits Required for the Program **12**

Notes:
The following sequence of courses is recommended. Please check course descriptions for pre and co-requisites:

I	*II*
CIS 121	*CIS 206*
	CIS 208
	CIS 221

Linux/Unix Systems I (CTUNX) — Certificate

Major/Area Requirements — **(10 Credits)**

CIS 121	Linux/UNIX Fundamentals	3
CIS 221	Linux/UNIX Tools and Scripts I	3
~~CIS 286~~ CIS 206	~~UNIX Systems Administration~~ Linux/UNIX II – Basic System Administration, Networking and Security	4

Minimum Credits Required for the Program: 12 ~~10~~ Credits

CIS 208 Linux/UNIX III – Intermediate System Administration, Network and Security

Notes: The following sequence of courses is recommended. Please check course descriptions for pre and co-requisites:

I	II
CIS 121	CIS 221
	~~CIS 286~~
	CIS 206
	CIS 208

Unix Systems (CTUNX)

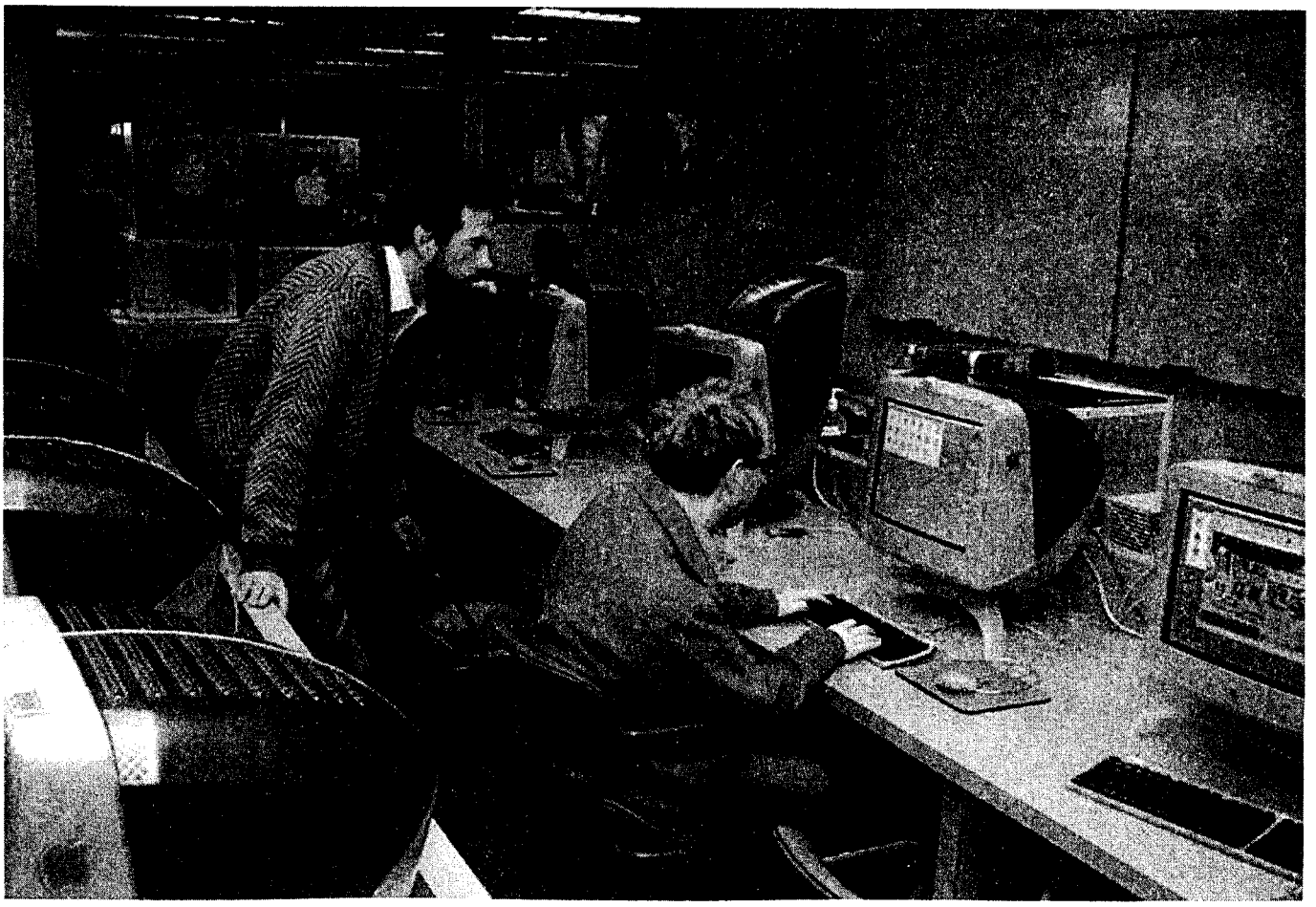
This program prepares students for jobs installing, configuring, and managing various UNIX and Linux operating systems. They will learn about UNIX/Linux file and directory organization, basic and advanced commands, shell scripting, networking, UNIX/Linux system administration and more. These skills can be applied to the related jobs of computer operator, system administrator, data recovery planner, and computer security coordinator.

Program Admission Requirements:

~~Students must complete CIS 110 or CPS 120 with a grade of "C" or better or have equivalent knowledge.~~

Completion of CIS, CPS or CSS course above CIS 100 or Permission of Instructor.

This program introduces students to the Linux and UNIX operating systems and prepares them to safely run their own home servers.



This is a revision of the current Linux and UNIX certificates which are being changed because of changes in the technology and to streamline the program. Currently we have eight courses, this reduces it to seven. (INP 285 will go away or be cross-listed with CIS 206.) There is about 30-35% new content in these classes, although more than that will be updated. At Liz's suggestion I am including the top two pages for the revised courses. Pages 3 & 4 will be finished by the end of June.

Here is what we are thinking of:

A series of courses to prepare the student for an entry level UNIX/Linux system position. There should be an emphasis on security through out the program (i.e. system, network and application).

First Cert – Linux/UNIX Systems I

CIS 121 Linux/UNIX I - Fundamentals

CIS 221 Linux/UNIX Programming and Scripting I

CIS 206 Linux/UNIX II – Basic System Administration, Networking and Security

CIS 208 Linux/UNIX III – Intermediate System Administration, Networking and Security

Second Cert – Linux/UNIX Systems II

CIS 210 Linux/UNIX IV – Advanced System Administration, Networking and Security

CIS 222 Linux/UNIX Programming and Scripting II

CIS 212 Linux/UNIX V – Advanced Topics

The Courses:

CIS 121 Linux/UNIX I – Fundamentals

Stand alone desktop focus. An introduction into the Linux/Unix world as a desktop environment. Setting the machine up for both GUI and

command line. Some desktop management (KDE or GNOME), setup office applications, utilities and programming/development environment.

1. Basic Intro
2. Basic Install
3. File/directory structure
4. Basic commands
    a. mail, login, telnet/ssh, passwd, who, date, exit, logout, startx, write, talk, mesg, cal, cat, cd, echo, find, locate, lp/lpr, ls, pwd, mount, umount, vi, man, cd, mkdir, mv, pwd, rmdir, set, variables, PS1, PATH, which, cp, file, more, less, touch, rm, *, ?, [], noclobber, ignoreeof, pipes, >, <, >>, comm, cut, grep, zip, unzip, head, tail, sort, tar, tee, tr, paste, whoami, uniq, wc, spell, chmod, chgrp, chown, umask, su, groups, du, df, fsck, ln, alias, bg, export, fg, kill, ps, top, unalias, sleep
5. Relative absolute path
6. Home directory
7. Basic GUI
8. Very simple script

CIS 221 Linux/UNIX Programming and Scripting I

Main focused on shell programming and scripting, the type of tasks that system administrators would need. Additionally, introduction to eclipse or other development environments.

1. Limited Regular Expressions: . * .* [ ] [!] ^ $ \(\) \{ \}
2. How the shell works and env
3. cut, paste, sed –n pdsg, sort, grep, uniq, variables, ‘, “, `, \, expr, $( ), $#, $*, shift, if then else fi, exit, case, && | |, $$
4. loops – for, while, until,
5. read
6. passing args
7. variables, running in current shell
8. readonly, $0, ${ }, ${ :- }, etc
9. wait
10. trap

11. functions
12. brief awk intro

CIS 206 Linux/UNIX II – Basic System Administration, Networking and Security

Introduction to using Linux/Unix in the enterprise environment. Introduction to System Administration concepts. Introduction to the concept of multi-user network systems, authentication, authorization, resource sharing, volume/directory management, basic networking and host based firewalls.

1. User Management
2. File Concepts
3. Minimal Server Installation
4. zip
5. tar
6. NFS
7. NIS
8. Automount
9. ssh
10. Partitioning
11. Logical Volume Manager
12. Basic Networking
    a. Intro to IP
    b. Intro to Subnet
13. IP Tables
14. Service
15. ifconfig
16. netstat
17. chkconfig
18. CUPS
19. Backups

CIS 208 Linux/UNIX III – Intermediate System Administration, Networking and Security

Continued focus on the theme of deploying/integrating Linux/Unix in the enterprise environment. Introduction to deploying essential services such as files services for Macintosh and Windows, domain name service, dynamic host configuration host protocol, mail, web and gateway services for the enterprise.

1. Samba
2. DNS
3. DHCP
4. NAT
5. Print sharing
6. ssh2 (keys)
7. mail (client: web based & thunderbird)
8. mail server
9. apache
10. tomcat
11. syslog
12. log management
13. ulimit/profiles
14. RAID

CIS 210 Linux/UNIX IV – Advanced System Administration, Networking and Security

Advanced topics in Linux/Unix Networking and Security. Advanced authentication and authorization schemes, network and host security, and advanced web topics.

1. Kerberos
2. Open LDAP
3. Port Security
4. snort
5. cgi
6. php
7. perl
8. lamp
9. squid

10. mail lists
11. PAM
12. RBAC/resource pools

CIS 222 Linux/UNIX Programming and Scripting II

1. Advanced scripting
2. awk
3. perl intro
4. php intro
5. JAVA intro

CIS 212 Linux/UNIX V – Advanced Topics
Special projects: single sign-on, web file access, iscsi, rpm package management, RedHat Proxy, grid computing, cluster computing, etc.

1. co-sign
2. mfile
3. building rpm packages
4. grid computing
5. cluster computing
6. Open VPN

Washtenaw Community College

Office of Curriculum & Articulation Services

PROGRAM CHANGE FORM

Program Code: **CTUNLN** **Program Name:** **Unix Systems** **Effective Term:** **Fall 2003**

Directions: 1.) Attach the current program listing from the WCC catalog and indicate any changes that you would like to make.

2.) Draw lines through anything that should be deleted and write in additions. Extensive narrative changes may be included on a separate sheet.

3.) Check the boxes below for each type of change being proposed. If you are making changes to courses or proposing new courses as part of this proposal, they must be approved separately using a Course-Syllabus Approval Form (CSAF). Courses that are being discontinued also should be submitted on CSAF forms.

1. Requested Changes:

- ☒ Remove 1 Course(s)
- ☐ Add _____ Course(s)
- ☒ Total Credits: Current Credits 16 After Changes 13
- ☒ Change Course Semester Sequencing
- ☒ Change Title (title was Unix/Linux Systems)
- ☐ Description
- ☐ Advisors
- ☐ Articulation Information
- ☒ Program Admission Requirements
- ☐ Continuing Eligibility Requirements
- ☐ Footnotes
- ☐ Other _____

Show all changes on the attached program sheet.

2. Rationale for Proposed Changes:

This certificate is the first in a series of two certificates on the Unix and Linux operating systems. This is the first of the certificates, and the title is being changed to reflect its strong emphasis on the Unix operating system.

~~Also, CIS 110 is being removed as a program requirement, and the certificate is being changed to an "advanced" certificate.~~

3. Financial/Staffing/Equipment/Space Implications:

None

4. Has the department consulted with all departments that may be impacted? Yes ☒ No ☐ NA ☐

Comments:

**REMINDER: Please include the current program sheet with all changes listed.

Signatures:

Reviewer	Print Name	Signature	Date
Program Change Initiator:	Phillip Geyer		2-19-03
Department Chair:	Michael Galea		2-19-03
Division Dean/Administrator:	Rosemary Wilson		2-25-03
Executive Vice President, Instruction			4/9/03

***Please submit completed form to the Office of Curriculum and Articulation Services.**

mlbCurriculum Development\Forms\Program Forms\Program Change Form v2.3.doc 6/18/02

Access Program File_____ Log _____ Copied and Returned _____

Copies: Initiator, Department Chair, Dean, Curriculum Files

New Listing to: Counseling: Admissions. Student Records

File Name: Program ChangeFormUnix Final v2 Advanced.doc

Computer Systems

Unix Systems (CTUNLN)
Certificate

'UNDER CONSTRUCTION'

Program Effective Term: Fall 2003

This program prepares you for jobs installing, configuring, and managing various UNIX and Linux operating systems. You will learn about UNIX/Linux file and directory organization, basic and advanced commands, shell scripting, networking, UNIX/Linux system administration and more. These skills can be applied to the related jobs of computer operator, system administrator, data recovery planner, and computer security coordinator.

Business and Computer Technologies Division
Computer Instruction Department

Advisors: Michael Galea, Phil Geyer

Program Admission Requirements:
Students must complete CIS 110 or CPS 120 with a grade of "C" or better or have equivalent knowledge.

Major/Area Requirements		**(10 Credits)**
CIS 121	Linux/UNIX Fundamentals	3
CIS 221	UNIX Tools and Scripts	3
CIS 286	UNIX Systems Administration	4
Minimum Credits Required for the Program:		**10**

Footnotes:
The following sequence of courses is recommended. Please check course descriptions for pre and co-requisites:

I	*II*
CIS 121	*CIS 204*
	CIS 221
	CIS 286

Unix Systems (CTUNLN)
~~**Advanced Certificate**~~

Program requirements shown below are for catalog year:

Description: This program prepares you for jobs installing, configuring, and managing various UNIX and Linux operating systems. You will learn about UNIX/Linux file and directory organization, basic and advanced commands, shell scripting, networking, UNIX/Linux system administration and more. These skills can be applied to the related jobs of computer operator, system administrator, data recovery planner, and computer security coordinator.

Division: Business and Computer Technologies

Department: Computer Instruction

Advisors: Michael Galea, Phil Geyer

Admission Requirements: CIS 110 or CPS 120 with grades of "C" or better or equivalent knowledge.

Major/Area Requirements ..... (~~15~~ 10 **Credits)**

CIS 121	Linux/UNIX Fundamentals	3
~~CIS 204~~	~~Linux Installation and Configuration~~	~~3~~
CIS 221	UNIX Tools and Scripts	3
CIS 286	UNIX Systems Administration*	4

delete NB. 3-28-03

Total Credits Required for the Program: ~~13~~ 10 **Credits** NB 3-28-03

Footnotes:
The following sequence of courses is recommended. Please check course descriptions for pre and co-requisites:

I	II
CIS 121	CIS 221
	CIS 286
	~~CIS 204~~

WASHTENAW COMMUNITY COLLEGE
PROGRAM AUTHORIZATION FORM

1. **Program Title:** Unix/Linux Systems — **Program Code:** ULSY
2. **Division:** BUS — **3. Department:** CISD — **CIP Code:**
4. **Type of Program:** ☐ **A.A.** ☐ A.S. ☐ A.A.S. ☐ A.T.S.
   ☐ Advanced Certificate ☒ Certificate ☐ Certificate of Completion
5. **Will this program be Perkins funded?** ☒ **yes** ☐ **no** — **6. Effective Year:** Fall 2000

7. Program Description (for Catalog, brochures, etc.:
This program prepares you for a job installing, configuring, and managing various UNIX and Linux operating systems. You will learn about UNIX/Linux file and directory organization, basic and advanced commands, shell scripting, networking, UNIX/Linux system administration, and more. The skills you learn can be applied to the related jobs of computer operator, system administrator, data recovery planner, and computer security coordinator.

8. Advisors:

9. Admissions Criteria:	**10. Criteria for Continuing Program Eligibility:**
Students must have passing scores on the College's placement tests in reading, writing, and math.	

11. Attach a Program Approval Document [PAD], which includes the following:

A. Program Description
B. Program Goals
C. Needs Assessment
D. Enrollment Projections
E. Program Cost Analysis
F. Course Descriptions
G. Analysis of Affected Instructional Units
H. Articulations
I. Licensure/Accreditation

Approval Recommended:	**Print Name**	**Signature**	**Date**
Program Initiator:			
Dept. Chair/Dir.:	Roland Meade		
Dean/Admin.:	Bella Parker		
VP, Instr/Stud Ser:	Guy Altieri		
President:	Larry Whitworth		

Date of Board Approval: _____

Available on disk

New Computer Degrees and Certificates

Certificates

- ### Unix/Linux Systems Certificate

Prepares students for: Jobs installing, configuring, and managing various UNIX and Linux operating systems. Students will learn about UNIX/Linux file and directory organization, basic and advanced commands, shell scripting, networking, UNIX/Linux system administration, and more.

Also gives students: Skills that can be applied to the related jobs of computer operator, system administrator, data recovery planner, and computer security coordinator.

Earning potential: Detroit-area computer operators reported yearly salaries of $27,700 for new hires and $37,400 for those with four years of experience in a recent survey by Computerworld magazine.

Program admissions requirements: Students must have passing scores on the College's placement tests in reading, writing, and math.

Major/Area Requirements	Credit hours
CIS 110 Business Computer Systems	3
CIS 117 Windows® Operating System	2
CPS 171 Introduction to Programming with C++	4
CIS 121 Linux/UNIX Fundamentals	3
CIS 221 UNIX Tools and Scripts	2
CIS 286 UNIX Systems Administration	4
CIS 122 The Linux Operating System	3
Total credit hours	**21**

- ### Windows Visual Basic Developer Certificate

Prepares students for: Jobs as a developer of graphical user interface programs on a PC. Intended for students who need to acquire skills in Windows application development in Visual Basic and for students who wish to acquire skills in programming Active Server Pages.

Also gives students: Skills that can be applied to the related jobs of programmer/analyst, Windows programmer, PC programmer, and Web programmer.

Earning potential: Programmers make average yearly salaries of $40,768 in the Detroit-Ann Arbor area and $40,872 statewide, according to the Michigan Occupational Information System.

Program admissions requirements: Students must have passing scores on the College's placement tests in reading, writing, and math. Successful completion of CIS 265 Programming the Web or equivalent experience. Note: Students in this program are also presumed to have prior coursework or experience in composing web pages in HTML.

COURSE REQUIREMENTS FOR PROGRAM

Course	Title	Credit	Pre-requisites/Co-requisites
CIS 110	Business Computer Systems	3	
CIS 117	Windows Operating System	2	
CPS 171	Introduction to Programming with C++	4	
CIS 121	Linux/UNIX Fundamentals	3	
CIS 221	UNIX Tools and Scripts	2	
CIS 286	UNIX Systems Administration	4	
CIS 122	The Linux Operating System	3	
	Minimum Credits Required:	**21**	

Washtenaw Community College

Unix/Linux® Systems (CTUNLN)
Certificate

This program prepares you for jobs installing, configuring, and managing various UNIX and Linux operating systems. You will learn about UNIX/Linux file and directory organization, basic and advanced commands, shell scripting, networking, UNIX/Linux system administration and more. These skills can be applied to the related jobs of computer operator, system administrator, data recovery planner, and computer security coordinator.

Computer Instruction Department

Advisor: Michael Galea, Phil Geyer

Program Admission Requirements:

The following high school courses or equivalents must be completed with a grade of "C" or better:

- Two years of high school algebra (Algebra I and II), or MTH 169, or equivalent score on COMPASS algebra test
- A high school course in word processing and spreadsheets, or CIS 100, or permission of the program advisor

Course Number	Course Title	Credit Hours
Major/Area Requirements		
CIS 110	Intro to Computer Information Systems	3
CIS 121	Linux/UNIX Fundamentals	3
CIS 122	The Linux Operating System	3
CIS 221	UNIX Tools and Scripts	2
CIS 286	UNIX Systems Administration	4
Credits Required for the Program		**15**

The following sequence of courses is recommended. Please check course descriptions for pre and co-requisites:

I	II	III
CIS 110	*CIS 121*	*CIS 122*
		CIS 221
		CIS 286

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Inquiries concerning programs and services under Title IX and Section 504, and the Americans with Disabilities Act should be directed to the Office of the Dean of Student Services; Room 225A, Student Center Building, 734- 973-3536. Inquiries regarding compliance in employment should be directed to the College Affirmative Action Officer in the Office of Human Resource Management, Room 120, Business Education Building, 934- 973-3497. Inquiries concerning access to facilities should be directed to the Director of Plant Operations, Plant Operations Building, 734- 677-5300.