Washtenaw Community College Comprehensive Report

CST 165 Computer Systems Technology II
Effective Term: Spring/Summer 2024

Course Cover

College: Business and Computer Technologies
Division: Business and Computer Technologies
Department: Computer Science & Information Technology
Discipline: Computer Systems Technology
Course Number: 165
Org Number: 13400
Full Course Title: Computer Systems Technology II
Transcript Title: Computer Systems Technology II
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission:
Change Information:
   Consultation with all departments affected by this course is required.
Rationale: Course update based on industry needs and program assessment.
Proposed Start Semester: Winter 2024
Course Description: In this course, students will expand on their knowledge of personal computer and digital technology as applied to servers and data centers through hands-on experiences. Students will install server hardware and server operating systems after determining system performance specifications. Students will also install Type I and II hypervisors, perform bandwidth tests and calculations, determine data center power usage efficiency, and manage data storage subsystems. Through lab practice, students will learn to mount, configure, and maintain servers in racks and cabinets optimizing performance and efficiency. Students with experience equivalent to CST 160 may contact the instructor for permission to waive the prerequisite. The title of this course was previously Computer Technology II.

Course Credit Hours

Variable hours: No
Credits: 4
Lecture Hours: Instructor: 60 **Student:** 60
Lab: Instructor: 0 **Student:** 0
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 60 **Student:** 60
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

No Level Required

Requisites

Prerequisite

Academic Reading and Writing Levels of 6

Prerequisite

CST 160 minimum grade "C"; may enroll concurrently

General Education

General Education Area 7 - Computer and Information Literacy

Assoc in Arts - Comp Lit

Assoc in Applied Sci - Comp Lit

Assoc in Science - Comp Lit

Request Course Transfer

Proposed For:

Eastern Michigan University

Ferris State University

Grand Valley State University

Jackson Community College

Kendall School of Design (Ferris)

Lawrence Tech

Michigan State University

Oakland University

University of Detroit - Mercy

University of Michigan

Wayne State University

Western Michigan University

Student Learning Outcomes

1. Identify, describe and inspect the physical and functional characteristics of the hardware components of a typical server computer system.
   Assessment 1
   Assessment Tool: Outcome-related departmental final exam questions
   Assessment Date: Winter 2024
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Answer key
   Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
   Who will score and analyze the data: Departmental faculty
   Assessment 2
   Assessment Tool: Outcome-related skills-based lab activity
   Assessment Date: Winter 2024
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Checklist
   Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
   Who will score and analyze the data: Departmental faculty

2. Install and configure server operating systems.
   Assessment 1

Assessment Tool: Outcome-related skills-based lab activity
Assessment Date: Winter 2024
Assessment Cycle: Every Three Years
Course section(s)/other population: All
Number students to be assessed: All
How the assessment will be scored: Checklist
Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
Who will score and analyze the data: Departmental faculty

3. Install and deploy external storage devices such as network-attached storage (NAS).
   Assessment 1
   Assessment Tool: Outcome-related skills-based lab activity
   Assessment Date: Winter 2024
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Checklist
   Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
   Who will score and analyze the data: Departmental faculty

4. Implement physical and logical server security.
   Assessment 1
   Assessment Tool: Outcome-related skills-based lab activity
   Assessment Date: Winter 2024
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Checklist
   Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
   Who will score and analyze the data: Departmental faculty

5. Configure servers to utilize virtualization technology to run multiple operating systems simultaneously.
   Assessment 1
   Assessment Tool: Outcome-related skills-based lab activity
   Assessment Date: Winter 2024
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Checklist
   Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
   Who will score and analyze the data: Departmental faculty

6. Identify appropriate backup and recovery techniques.
   Assessment 1
   Assessment Tool: Outcome-related departmental final exam questions
   Assessment Date: Winter 2024
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All

How the assessment will be scored: Answer key
Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
Who will score and analyze the data: Departmental faculty

Course Objectives

1. Install, configure, and/or upgrade server hardware, and operating systems.
2. Describe the various Redundant Array of Independent Disks (RAID) levels used in server room environments.
3. Calculate server and data center bandwidth requirements.
4. Describe power usage requirements for a given data center configuration.
5. Describe and select appropriate server central processing units (CPUs) for a given environment.
6. Describe and implement server Error Correction Code (ECC) Random-Access Memory in a given environment.
7. Build and configure various server racks and cabinets to contain multiple servers efficiently.
8. Implement proper environmental controls and techniques.
9. Configure servers to use Internet Protocol (IP) addressing and network infrastructure services.
10. Describe proper cabling infrastructure and cable management using Electronic Industries Alliance (EIA)/Telecommunications Industry Association (TIA) standards.
11. Install cables and implement proper cable management procedures within racks and cabinets.
12. Install, configure and demonstrate use of an NAS device.
13. Explain the importance of disaster recovery and business continuity principles.
14. Describe the difference between Hot Site, Cold Site and Warm Site facilities.
15. Describe principles and techniques related to uninterrupted power supplies for maintaining critical systems sustainability.
16. Build a functional server based ethernet network.
17. Describe the specifications for an energy efficient server room and data center.
18. Create a capstone data center project that demonstrates understanding of all modules in this course.

New Resources for Course

Course Textbooks/Resources

Textbooks
  CDTS LLC. *Server and Data Center Technologies*, 4th or greater ed. Lulu Press, 2023, ISBN: 9781312647527.
Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom
Computer workstations/lab
Data projector/computer

Reviewer	Action	Date
Faculty Preparer:		
James Lewis	*Faculty Preparer*	*Apr 27, 2023*
Department Chair/Area Director:		
Scott Shaper	*Recommend Approval*	*May 05, 2023*
Dean:		
Eva Samulski	*Recommend Approval*	*May 12, 2023*
Curriculum Committee Chair:		
Randy Van Wagnen	*Recommend Approval*	*Jan 07, 2024*

Assessment Committee Chair:

Jessica Hale   *Recommend Approval*   *Jan 08, 2024*

Vice President for Instruction:

Brandon Tucker   *Approve*   *Jan 09, 2024*

Washtenaw Community College Comprehensive Report

CST 165 Computer Technology II
Effective Term: Fall 2013

Course Cover

Division: Business and Computer Technologies
Department: Computer Instruction
Discipline: Computer Systems Technology
Course Number: 165
Org Number: 13400
Full Course Title: Computer Technology II
Transcript Title: Computer Technology II
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Course Change
Change Information:
    Consultation with all departments affected by this course is required.
    Course title
    Course description
    Credit hours
    Total Contact Hours
    Outcomes/Assessment
    Objectives/Evaluation
Rationale: Replace the advanced computer systems technology course, which was focused on personal computers, with a course that includes client server computer systems.
Proposed Start Semester: Fall 2013
Course Description: Through hands-on experiences, this course builds on the student's knowledge of personal computer installation, configuration, upgrading, and troubleshooting, with an emphasis on servers in the data center. Students learn both fundamental and advanced techniques in working with the Windows operating system. Students apply their understanding of the operating system's functions and structure, and employ common diagnostic utilities and tools, to identify steps to correct system problems. This course contains content previously taught in CST 155.

Course Credit Hours

Variable hours: No
Credits: 4
Lecture Hours: Instructor: 60 **Student:** 60
Lab: Instructor: 0 **Student:** 0
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 60 **Student:** 60
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites
Prerequisite
Academic Reading and Writing Levels of 6
Prerequisite minimum grade "C"; may enroll concurrently
CST 160 minimum grade "C" or equivalent. CST 160 has not yet been approved; therefore it could not be selected in the Course# and Title drop-down box. CST 160 will be the first 7.5 week class, while CST 165 will be the second 7.5 weeks.

General Education
General Education Area 7 - Computer and Information Literacy
Assoc in Arts - Comp Lit
Assoc in Applied Sci - Comp Lit
Assoc in Science - Comp Lit

Request Course Transfer
Proposed For:
Central Michigan University
Eastern Michigan University
Ferris State University
Grand Valley State University
Jackson Community College
Kendall School of Design (Ferris)
Lawrence Tech
Michigan State University
Oakland University
University of Detroit - Mercy
University of Michigan
Wayne State University
Western Michigan University

Student Learning Outcomes

1. Identify and describe the physical and functional characteristics of the hardware components of a typical server computer system.
   Assessment 1
   Assessment Tool: A multiple-choice departmental final exam.
   Assessment Date: Winter 2016
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Answer Key
   Standard of success to be used for this assessment: At least 70% of the students will score 70% or better.
   Who will score and analyze the data: Blackboard will score the test, and departmental faculty will analyze the data.

2. Troubleshoot and repair client and server computer systems.
   Assessment 1
   Assessment Tool: A skills-based assessment test
   Assessment Date: Winter 2016
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: A departmental task list will be used.
   Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the completion of tasks.

Who will score and analyze the data: Departmental faculty
Assessment 2
Assessment Tool: A multiple-choice departmental final exam.
Assessment Date: Winter 2016
Assessment Cycle: Every Three Years
Course section(s)/other population: All
Number students to be assessed: All
How the assessment will be scored: Answer Key
Standard of success to be used for this assessment: At least 70% of the students will score 70% or better.
Who will score and analyze the data: Blackboard will score the test, and departmental faculty will analyze the data.

3. Deploy Microsoft Windows clients.
   Assessment 1
   Assessment Tool: A skills-based assessment lab activity
   Assessment Date: Winter 2016
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: A departmental task list will be used.
   Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the completion of tasks.
   Who will score and analyze the data: Departmental faculty
   Assessment 2
   Assessment Tool: A multiple-choice departmental final exam.
   Assessment Date: Winter 2016
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Answer Key
   Standard of success to be used for this assessment: At least 70% of the students will score 70% or better.
   Who will score and analyze the data: Blackboard will score the test, and departmental faculty will analyze the data.

4. Perform client and server disaster recovery.
   Assessment 1
   Assessment Tool: A skills-based assessment lab activity
   Assessment Date: Winter 2016
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: A departmental task list will be used.
   Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the completion of tasks.
   Who will score and analyze the data: Departmental faculty
   Assessment 2
   Assessment Tool: A multiple-choice departmental final exam.
   Assessment Date: Winter 2016
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Answer Key
   Standard of success to be used for this assessment: At least 70% of the students will score 70% or better.
   Who will score and analyze the data: Blackboard will score the test, and

departmental faculty will analyze the data.

5. Determine the power, cooling, cabling and equipment requirements for a given data center.
   Assessment 1
   Assessment Tool: A skills-based assessment
   Assessment Date: Winter 2016
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: A departmental task list will be used.
   Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the completion of tasks.
   Who will score and analyze the data: Departmental faculty
   Assessment 2
   Assessment Tool: A multiple-choice departmental final exam.
   Assessment Date: Winter 2016
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Answer Key
   Standard of success to be used for this assessment: At least 70% of the students will score 70% or better.
   Who will score and analyze the data: Blackboard will score the test, and departmental faculty will analyze the data.

Course Objectives

1. Install, configure, and/or upgrade client and/or server hardware.
   Matched Outcomes
   1. Identify and describe the physical and functional characteristics of the hardware components of a typical server computer system.
   2. Troubleshoot and repair client and server computer systems.
2. Diagnose and troubleshoot hardware problems.
   Matched Outcomes
   2. Troubleshoot and repair client and server computer systems.
3. Identify proper backup and restore techniques for both client and server computers.
   Matched Outcomes
   4. Perform client and server disaster recovery.
4. Identify the various operating system deployment methods, select and implement the appropriate method for a given situation.
   Matched Outcomes
   3. Deploy Microsoft Windows clients.
5. Identify the power, cooling and network equipment requirements, and select the appropriate equipment for a given situation.
   Matched Outcomes
   5. Determine the power, cooling, cabling and equipment requirements for a given data center.
6. Identify and describe the physical and functional characteristics of typical server hardware components.
   Matched Outcomes
   1. Identify and describe the physical and functional characteristics of the hardware components of a typical server computer system.
7. Diagnose and troubleshoot operating system problems.
   Matched Outcomes
   2. Troubleshoot and repair client and server computer systems.

New Resources for Course
Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software
Equipment/Facilities
Level III classroom
Computer workstations/lab
Data projector/computer

Reviewer	**Action**	**Date**
Faculty Preparer:		
John Trame	*Faculty Preparer*	*Feb 18, 2013*
Department Chair/Area Director:		
John Trame	*Recommend Approval*	*Feb 18, 2013*
Dean:		
Rosemary Wilson	*Recommend Approval*	*Feb 20, 2013*
Vice President for Instruction:		
Bill Abernethy	*Approve*	*Apr 26, 2013*