
EDG 4432: Computer Systems and Networking for K-12 Teachers**3 Credits****COURSE SYLLABUS**

Semester: Fall 2026

Course Type: 100% Full Distance Learning

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I. Welcome!

This course provides a comprehensive introduction to the fundamental hardware and software components of computer systems and the networks that connect them, specifically designed for K-12 educational settings. We will explore the inner workings of computers, from input and output devices to processing and storage. You will learn to evaluate different data storage technologies, distinguish between system and application software, and leverage productivity software for educational tasks. The course also demystifies computer networking, covering key concepts like network protocols, the client-server model, cloud computing, and the functions of common network devices. By the end of this course, you will possess a robust understanding of computer systems, empowering you to effectively manage classroom technology and integrate these essential concepts into your teaching.

II. University Course Description

This course provides a comprehensive overview of computer systems and networking for educators. It covers core topics such as computer hardware components and functions, data storage technologies, system and application software, productivity software applications, and fundamental networking concepts and devices. The course equips teachers with the practical knowledge needed to understand, utilize, and teach about computer systems in K-12 curricula.

III. Course Prerequisites

None

IV. Course Purpose

This course serves as a foundational introduction to computer systems and networking. As technology becomes increasingly integrated into education, this course equips K-12 teachers with the theoretical knowledge and practical understanding of how computers and networks operate. The course focuses on exploring these core concepts, making it essential for educators seeking to become more proficient with classroom technology, troubleshoot common issues, and foster digital literacy in their students.

V. Course Format

This fully online course is structured through weekly modules that combine asynchronous recorded lectures with hands-on technical demonstrations and projects. Students engage through discussion boards for peer interaction and complete practical assignments applying AI tools to educational scenarios. The course offers flexibility through asynchronous learning while maintaining support through individual consultation sessions with the instructor as needed.

VI. Student Learning Outcomes

Upon completion of this course, students will be able to:

- Identify the hardware components of a computer system and their functions (e.g., input, output, processing, storage).
- Analyze the advantages, disadvantages, or both of various data storage technologies.
- Identify the characteristics and uses of various types of software (e.g., system, application).
- Apply features and functions of application and productivity software.
- Identify concepts and terminology related to networks (e.g., network protocols, Open Systems Interconnection model, client-server, cloud computing).
- Identify characteristics and uses of network devices (e.g., servers, routers, switches, access points, workstations).

VII. Course Objectives

Students will:

- Diagram a computer system, labeling key hardware components and describing their respective functions in the input, processing, output, and storage cycle.
- Compare and contrast different data storage technologies (magnetic, solid-state, optical) and recommend an appropriate technology for a given educational scenario.
- Differentiate between system software and application software, providing examples of each and explaining their roles in a functional computer system.
- Create a classroom resource (e.g., a lesson plan, a gradebook, a presentation) using standard productivity software, utilizing core features and functions.
- Explain how data travels across a network by describing the role of key networking concepts, including protocols, the OSI model, and client-server relationships.
- Design a simple network diagram for a classroom or school lab, identifying the necessary network devices and their specific functions.

VIII. Required Texts and/or Readings and Course Materials

- There are no required text in this course. All of the course materials (videos, readings etc. will be available on the course website with free access. A computer with internet access and capable of running AI applications is required for this course.

IX. Supplementary (Optional) Texts and Materials

NA

X. How to Succeed in this Course

To succeed in this course, students should establish strong study habits from the beginning. This includes completing all weekly readings prior to attempting practical exercises and actively engaging with technical demonstrations. Time management is crucial - start assignments well before deadlines to allow for troubleshooting and maintain detailed documentation of your

technical implementation process. Regular engagement with course materials, peers, and AI tools is essential for building practical skills. Finally, always maintain backup copies of all project work to prevent any potential data loss during technical exercises.

XI. Academic Continuity

As this course is already fully online, any disruptions due to emergencies or severe weather will have minimal impact on course delivery. All course materials, including recorded lectures, assignments, and resources, will remain accessible through Canvas. If USF systems are impacted, backup copies of essential materials will be made available through Microsoft Teams. The instructor will communicate any changes or contingency plans through Canvas announcements and email. While most activities are asynchronous, any scheduled synchronous sessions (like individual consultations) will be rescheduled if disrupted, with alternative times communicated through Canvas.

XII. Communication

Primary communication for this course will be through Canvas messaging and announcements. For urgent matters, you may contact your instructor with the email provided on top. Your instructor typically responds to messages within 24 hours during weekdays and 48 hours on weekends. Virtual office hours are available by appointment through Microsoft Teams. Professional communication etiquette is expected in all interactions - please include your name and course number in email subjects.

XIII. Grading Scale

Grading Scale (%)	
90-100	A
80 - 89	B
70 - 79	C
60 - 69	D
0 - 59	F

XIV. Grade Categories and Weights

The final grade is directly tied to the mastery of each sub-competency. Each assignment will be graded using a specialized rubric designed to assess mastery of its corresponding sub-competency.

Sub-Competency	Assessments	Weight of final Grade
5.1: Identify the hardware components of a computer system and their functions.	Discussion 5.1: Classroom Hardware Inventory, Quiz 5.1: Hardware Components and Functions	15%
5.2: Analyze the advantages and disadvantages of various data storage technologies.	Discussion 5.2: Choosing Storage for School, Storage Technology Analysis Report 5.2	20%
5.3: Identify the characteristics and uses of various types of software.	Discussion 5.3: System vs. Application Software, Quiz 5.3: Software Types and Characteristics	15%

5.4: Apply features and functions of application and productivity software.	Discussion 5.4: Productivity Software Power Tips, Productivity Software Project 5.4	20%
5.5: Identify concepts and terminology related to networks.	Discussion 5.5: Networks in Education, Quiz 5.5: Networking Concepts and Terminology	15%
5.6: Identify characteristics and uses of network devices.	Discussion 5.6: Building a Classroom Network, Network Design Diagram Assignment 5.6	10%
Course Participation	Consistent engagement in weekly modules and discussions	5%
TOTAL		100%

XV. Instructor Feedback Policy & Grade Dissemination

Course modules open every Monday at 12:00 AM and close Sunday at 11:59 PM EST. All assignments must be submitted within this one-week window; late submissions are not accepted given the full week provided for completion. Individual feedback and grades will be posted in Canvas by Wednesday 5:00 PM of the following week. Major assignments like projects and the final portfolio may require additional grading time, which will be communicated in advance. All grades and feedback can be accessed through the Canvas gradebook.

XVI. Course Schedule.

Week	Topics & Subitems	Assessment/Assignment
1	Introduction to Computer Systems (Sub-competency 5.1): (1) The Computer System: Hardware, Software, Liveware (2) The System Unit (3) The Motherboard (4) The Central Processing Unit (CPU)	Discussion 5.1: Classroom Hardware Inventory Conduct a quick inventory of the hardware in your classroom or a classroom you know. List at least three input, output, and processing/storage devices and briefly describe their educational use.
2	Hardware Components and Functions (Sub-competency 5.1): (1) Input Devices (Keying, Pointing) (2) Output Devices (Displays, Printers) (3) Storage Devices (Primary vs. Secondary) (4) The Information Processing Cycle	Quiz 5.1: Hardware Components and Functions Covers the identification and function of key computer hardware components..
3	Data Storage Technologies (Sub-competency 5.2): (1) The Three Main Storage Types (2) Solid-State Storage (USB, SD Cards) (3) Magnetic Storage (Hard Drives, Tape) (4) Optical Storage (CDs, DVDs, Blu-ray)	Discussion 5.2: Choosing Storage for School Your school needs to purchase new storage for student portfolios (large files, infrequent access) and for daily lesson plans (small files, frequent access). Recommend a storage technology for each and justify your choice based on advantages and disadvantages.

4	Evaluating Storage Solutions (Sub-competency 5.2): (1) Durability and Portability (2) Access Speed and Cost (3) Capacity and Longevity (4) "WORM" and Rewritable Media	Storage Technology Analysis Report 5.2 Compare and contrast magnetic, solid-state, and optical storage technologies. Create a one-page report that outlines the advantages and disadvantages of each and provides a recommended use case in a school setting.
5	Software Fundamentals (Sub-competency 5.3): (1) The Language of Computers (2) System Software (Operating Systems) (3) Application Software (4) Programming Languages	Discussion 5.3: System vs. Application Software Describe the operating system on your primary computer. Then, list three application software programs you use for teaching. Explain the fundamental difference between the OS and these applications.
6	Types and Uses of Software (Sub-competency 5.3): (1) Popular Operating Systems (Windows, macOS, Linux, Chrome OS) (2) Common Application Categories (3) Proprietary vs. Open Source (4) Software in the K-12 Environment	Quiz 5.3: Software Types and Characteristics Tests the ability to distinguish between system and application software and identify their characteristics and uses.
7	Productivity Software Suite (Sub-competency 5.4): (1) What is Productivity Software? (2) Core Components: Word Processor, Spreadsheet, Presentation (3) Other Components: Database, Desktop Publishing (4) Popular Suites (Microsoft Office, Google Workspace)	Discussion 5.4: Productivity Software Power Tips Share your favorite "power tip" or lesser-known feature in a productivity software application (e.g., a Word style, an Excel formula, a PowerPoint shortcut). Explain how it saves you time or enhances your work.
8	Applying Productivity Software (Sub-competency 5.4): (1) Creating Effective Documents (2) Data Management with Spreadsheets (3) Designing Engaging Presentations (4) Collaboration and Cloud-Based Tools	Productivity Software Project 5.4 Create a small suite of classroom resources. This could include a lesson plan (word processor), a simple gradebook or data tracker (spreadsheet), and a brief introductory slide deck for a unit (presentation software).
9	Networking Concepts (Sub-competency 5.5): (1) What is a Computer Network? (2) The Client-Server Model (3) Introduction to Network Protocols (4) The Internet and Cloud Computing	Discussion 5.5: Networks in Education Reflect on your school's network. Provide an example of a client-server interaction you or your students use daily (e.g., accessing email, saving to a network drive). What is the client and what is the server in your example?
10	Networking Models and Protocols (Sub-competency 5.5): (1) The OSI Model (2) Key Protocols (TCP/IP, HTTP/S, FTP) (3) Local Area Networks (LAN) vs. Wide Area Networks (WAN) (4) Cloud Computing Services (IaaS, PaaS, SaaS)	Quiz 5.5: Networking Concepts and Terminology Covers key networking concepts, terminology, and models such as the OSI model, client-server, and cloud computing.

11	Network Devices (Sub-competency 5.6): (1) The Backbone of Networks (2) Hubs, Switches, and Routers (3) Wireless Access Points (WAPs) (4) Modems and Firewalls	Discussion 5.6: Building a Classroom Network Imagine you are setting up a wireless network for a new computer lab. What is the core device you would need to connect the lab to the school's main network (router), and what device would you need to provide wireless connectivity to student laptops (access point)?
12	Functions of Network Devices (Sub-competency 5.6): (1) How Routers Route Traffic (2) How Switches Connect Devices (3) The Role of Access Points (4) Securing Network Devices	Network Design Diagram Assignment 5.6 Using a simple diagramming tool (or drawn by hand and scanned), create a basic network diagram for a classroom of 20 computers. Your diagram must include and label a router, a switch, and a wireless access point, and briefly describe the function of each in this context.
13	Integration & Application: (1) Case study analysis (2) Applying all competencies to a complex problem (3) Peer review of final portfolio components	Final Review Discussion Analyze a case study of a school struggling with outdated technology. Identify issues related to hardware, storage, software, and networking. Propose a phased upgrade plan, justifying your choices based on course concepts.
14	Synthesis & Portfolio Finalization: (1) Course synthesis (2) Portfolio assembly and review (3) Future application in K-12 settings	All Final Assignments Due Final, polished versions of all major assignments (5.2, 5.4, 5.6) must be submitted as a cumulative portfolio by the end of Week 14.

* Note: The Schedule is subject to revision

XVII. General Education Statement (undergraduate only – Required if a Gen Ed course)

NA

XVIII. Integration of This Course into Your Academic Experience (Gen Ed courses only)

NA

XIX. Global Citizens Project (only required if a GCP course; must be verbatim)

NA

XX. USF Core Syllabus Policies

USF has a set of central policies related to student recording class sessions, academic integrity and grievances, student accessibility services, academic disruption, religious observances, academic continuity, food insecurity, pregnancy and related conditions, and sexual harassment that **apply to all courses at USF**. Be sure to review these online: usf.edu/provost/faculty-success/resources-policies-forms/core-syllabus-policy-statements.aspx

XXI. Course Policies: Grades

Late Work Policy: Offer specifics about your policy on late work.

Each module provides a full 7-day window for completion, and no late submissions will be accepted after the weekly deadline. To ensure success in this course, it is strongly recommended to begin each module on Monday rather than waiting until the weekend. Starting early allows time to troubleshoot technical issues, engage meaningfully in discussions, and seek clarification if

needed. Students who consistently complete work early in the module week typically perform better and experience less stress than those who leave work until the last minute.

Medical Excuses:

If illness prevents coursework completion, students must immediately notify the instructor and submit medical documentation. While this is an online course with no physical attendance requirements, prompt communication regarding any medical issues impacting your ability to complete coursework is essential for arranging accommodations.

Grades of "Incomplete":

For graduate courses: An Incomplete grade ("I") is exceptional and granted at the instructor's discretion only when students are unable to complete course requirements due to illness or other circumstances beyond their control. The course instructor and student must complete and sign the "I" Grade Contract Form that describes the work to be completed, the date it is due, and the grade the student would earn factoring in a zero for all incomplete assignments. The due date can be negotiated and extended by student/instructor as long as it does not exceed two semesters for undergraduate courses and one semester for graduate courses from the original date grades were due for that course. An "I" grade not cleared within the two semesters for undergraduate courses and one semester for graduate courses (including summer semester) will revert to the grade noted on the contract.

Attendance Policy:

For this online course, regular participation is measured through timely completion of weekly modules and engagement with course materials. Students are expected to log in to the course per week to review content, participate in discussions, and complete assignments.

Campus Free Expression:

It is fundamental to the University of South Florida's mission to support an environment where divergent ideas, theories, and philosophies can be openly exchanged and critically evaluated. Consistent with these principles, this course may involve discussion of ideas that you find uncomfortable, disagreeable, or even offensive. In the instructional setting, ideas are intended to be presented in an objective manner and not as an endorsement of what you should personally believe. "Objective" means that the idea(s) presented can be tested by critical peer review and rigorous debate, and that the idea(s) is supported by credible research. In this course you may be asked to engage with complex ideas and to demonstrate an understanding of the ideas. Understanding and engaging with an idea does not require you to believe it or to agree with it.

Final Examinations Policy:

No exam, non-applicable

XXII. Course Policies: Technology and Media (include sections as applicable to your course)

Canvas:

This course is fully delivered through Canvas Learning Management System. Students must log in regularly to access course materials, assignments, and announcements. Weekly modules open

Monday 12:00 AM and close Sunday 11:59 PM EST. All course communication, submission of assignments, and grade distribution will be conducted through Canvas. For technical support, contact USF IT at (813) 974-1222 or help@usf.edu.

XXIII. Course Policies: Student Expectations

Health and Wellness: Example statement supporting student health and wellbeing.

Your health is a priority at the University of South Florida. We encourage members of our community to look out for each other and to reach out for help if someone is in need. If you or someone you know is in distress, please make a referral at www.usf.edu/sos so that the Student Outreach & Support can contact and provide helpful resources to the student in distress. A 24-hour licensed mental healthcare professional, offered through the counseling center, is available by phone at 813-974-2831, option 3. Please remember that asking for help is a sign of strength. In case of emergency, please dial 9-1-1.

Title IX Policy: It is recommended you include the paragraph below verbatim.

Title IX provides federal protections for discrimination based on sex, which includes discrimination based on pregnancy, sexual harassment, and interpersonal violence. In an effort to provide support and equal access, **USF has designated all faculty (TA, Adjunct, etc.) as Responsible Employees, who are required to report any disclosures of sexual harassment, sexual violence, relationship violence or stalking.** The Title IX Office makes every effort, when safe to do so, to reach out and provide resources and accommodations, and to discuss possible options for resolution. Anyone wishing to make a Title IX report or seeking accommodations may do so online, in person, via phone, or email to the Title IX Office. For information about Title IX or for a full list of resources please visit: <https://www.usf.edu/title-ix/gethelp/resources.aspx>. *If you are unsure what to do, please contact Victim Advocacy – a confidential resource that can review all your options – at 813-974-5756 or va@admin.usf.edu.*

Generative AI: With advancements in AI, tools like GPT-4 can generate human-like text, raising potential issues related to academic integrity and the authenticity of student work. Hence, it's essential to establish clear policies that are communicated to students from the outset of a course. CITL has developed some recommendations that you may consider using in your syllabus here: [CITL Generative AI Syllabus Course Policy Recommendations](#)

Course Hero / Chegg Policy: Offer specifics about your policy on contract cheating, paper mills, or the use of websites that enable cheating.

Example: The [USF Policy on Academic Integrity](#) specifies that students may not use websites that enable cheating, such as by uploading or downloading material for this purpose. This does apply specifically to Chegg.com and CourseHero.com – almost any use of these websites (including uploading proprietary materials) constitutes a violation of the academic integrity policy.

Professionalism Policy:

All course interactions must maintain professional etiquette. Students will communicate respectfully in discussion boards, emails, and group work. Written communications must be clear, appropriate, and maintain a professional tone. Disruptive behavior in online interactions may affect your final grade. For group activities, timely responses and meaningful contributions are required.

Netiquette Guidelines

Professional communication is essential in our online learning environment. When participating in course activities, maintain the same respect and courtesy as in face-to-face interactions. Consider diverse perspectives and remember that written communication lacks verbal cues. Keep messages clear, focused, and constructive. Always proofread for clarity, avoiding all caps and informal language. Complete thoughts on one topic before introducing new ones. Avoid sarcasm and humor that could be misinterpreted. Following these guidelines in Canvas will create a positive learning environment.

End of Semester Student Evaluations:

All classes at USF make use of an online system for students to provide feedback to the University regarding the course. These surveys will be made available at the end of the semester, and the University will notify you by email when the response window opens. Your participation is highly encouraged and valued.

XXIV. Learning Support and Campus Offices

Academic Accommodations

Students with disabilities are responsible for registering with Student Accessibility Services (SAS) in order to receive academic accommodations. For additional information about academic accommodations and resources, you can visit the SAS website.

[SAS website for the Tampa and Sarasota-Manatee campuses.](#)

[SAS website for the St. Pete campus.](#)

Academic Support Services

The USF Office of Student Success coordinates and promotes university-wide efforts to enhance undergraduate and graduate student success. For a comprehensive list of academic support services available to all USF students, please visit the [Office of Student Success website](#).

Canvas Technical Support

Include information where students can find technical support.

Example: If you have technical difficulties in Canvas, you can find access to the Canvas guides and video resources in the "Canvas Help" page on the homepage of your Canvas course. You can also contact the help desk by calling 813-974-1222 in Tampa or emailing help@usf.edu.

[IT website for the Tampa campus.](#)

[IT website for the St. Pete campus.](#)

[IT website for the Sarasota-Manatee campus.](#)

Center for Victim Advocacy

Example: The [Center for Victim Advocacy](#) empowers survivors of crime, violence, or abuse by promoting the restoration of decision making, by advocating for their rights, and by offering support and resources. Contact information is available online.

Counseling Center

Example: The Counseling Center promotes the wellbeing of the campus community by providing culturally sensitive counseling, consultation, prevention, and training that enhances student academic and personal success. Contact information is available online.

[Counseling Center website for the Tampa campus.](#)

[Counseling Center website for the St. Pete campus.](#)

[Counseling Center website for the Sarasota-Manatee campus.](#)

Tutoring

Example: The Tutoring Hub offers free tutoring in several subjects to USF undergraduates.

Appointments are recommended, but not required. For more information, email

[asctampa@usf.edu.](mailto:asctampa@usf.edu)

[Tutoring website for the Tampa campus.](#)

[Tutoring website for the St. Pete campus.](#)

[Tutoring website for the Sarasota-Manatee campus.](#)

Writing Studio

Example: The Writing Studio is a free resource for USF undergraduate and graduate students. At the Writing Studio, a trained writing consultant will work individually with you, at any point in the writing process from brainstorming to editing. Appointments are recommended, but not required. For more information or to make an appointment, email:

[writingstudio@usf.edu.](mailto:writingstudio@usf.edu)

[Writing studio website for the Tampa campus.](#)

[Writing studio website for the St. Pete campus.](#)

[Writing studio website for the Sarasota-Manatee campus.](#)

XXV.Important Dates to Remember

All dates, assignments, and course content are tentative and subject to change at the instructor's discretion. Note: While modules follow a weekly schedule, changes will be announced through Canvas at least one week in advance

For official USF academic deadlines and holidays, refer to the Academic Calendar at

<http://www.usf.edu/registrar/calendars/>