

[Course Syllabus](#)

Module 0:

Link to free textbook: <https://www.pdfdrive.net/the-architecture-of-computer-hardware-and-system-software-e20630163.html>

[Vannebar Bush's Memex Link: https://en.wikipedia.org/wiki/Memex](https://en.wikipedia.org/wiki/Memex)

[Link – The Internet: http://en.wikipedia.org/wiki/Internet](http://en.wikipedia.org/wiki/Internet)

[Link – Von Neumann Architecture: https://www.computerscience.gcse.guru/theory/von-neumann-architecture](https://www.computerscience.gcse.guru/theory/von-neumann-architecture)

[Link – Von Neumann Architecture Def: https://en.wikipedia.org/wiki/Von_Neumann_architecture](https://en.wikipedia.org/wiki/Von_Neumann_architecture)

[Link – History of Computing: https://en.wikipedia.org/wiki/History_of_computing](https://en.wikipedia.org/wiki/History_of_computing)

[Link – Computer Systems Architecture: https://www.techopedia.com/definition/26757/computer-architecture](https://www.techopedia.com/definition/26757/computer-architecture)

[Link – Computer Systems Architecture Lecture: http://www.cs.utexas.edu/users/mckinley/352/lectures/01.pdf](http://www.cs.utexas.edu/users/mckinley/352/lectures/01.pdf)

Module 1:

[Link – Number Systems: http://en.wikipedia.org/wiki/Numeral_system](http://en.wikipedia.org/wiki/Numeral_system)

[Link – Binary Numbers: https://www.mathsisfun.com/binary-number-system.html](https://www.mathsisfun.com/binary-number-system.html)

[Link – Binary Numbers: https://en.wikipedia.org/wiki/Binary_number](https://en.wikipedia.org/wiki/Binary_number)

[Link – Hexidecimal Numbers: https://www.electronics-tutorials.ws/binary/bin_3.html](https://www.electronics-tutorials.ws/binary/bin_3.html)

[Link – Converting Decimal to Binary: https://www.electronics-tutorials.ws/binary/bin_2.html](https://www.electronics-tutorials.ws/binary/bin_2.html)

[Link – Data formats: https://en.wikipedia.org/wiki/Data_format](https://en.wikipedia.org/wiki/Data_format)

[Link – Set theory: https://byjus.com/maths/set-theory-symbols/](https://byjus.com/maths/set-theory-symbols/)

[Link – What is Unicode: http://unicode.org/standard/WhatIsUnicode.html](http://unicode.org/standard/WhatIsUnicode.html)

[Link – Encoding information: http://kunststube.net/encoding/](http://kunststube.net/encoding/)

[Link – more on Unicode: https://en.wikipedia.org/wiki/Unicode](https://en.wikipedia.org/wiki/Unicode)

[Link – Floating Point numbers: http://www.cs.utah.edu/~zachary/isp/applets/FP/FP.html](http://www.cs.utah.edu/~zachary/isp/applets/FP/FP.html)

[Link – more on number systems: https://code.tutsplus.com/articles/number-systems-an-introduction-to-binary-hexadecimal-and-more--active-10848](https://code.tutsplus.com/articles/number-systems-an-introduction-to-binary-hexadecimal-and-more--active-10848)

[Link – twos complement integer: https://en.wikipedia.org/wiki/Two%27s_complement](https://en.wikipedia.org/wiki/Two%27s_complement)

Module 2:

[Link – Digital logic book chapter: http://users.ece.utexas.edu/~valvano/Volume1/E-Book/C4_DigitalLogic.htm](http://users.ece.utexas.edu/~valvano/Volume1/E-Book/C4_DigitalLogic.htm)

[Link – Digital logic: https://learn.sparkfun.com/tutorials/digital-logic/all](https://learn.sparkfun.com/tutorials/digital-logic/all)

[Link – Boolean Function: https://en.wikipedia.org/wiki/Boolean_function](https://en.wikipedia.org/wiki/Boolean_function)

[Link – Computer Registers: https://en.wikipedia.org/wiki/Processor_register](https://en.wikipedia.org/wiki/Processor_register)

[Link – Arithmetic Logic Unit: https://en.wikipedia.org/wiki/Arithmetic_logic_unit](https://en.wikipedia.org/wiki/Arithmetic_logic_unit)

[Link – Control Unit: https://en.wikipedia.org/wiki/Arithmetic_logic_unit](https://en.wikipedia.org/wiki/Arithmetic_logic_unit)

[Link- Data Bus: https://en.wikipedia.org/wiki/Bus_\(computing\)](https://en.wikipedia.org/wiki/Bus_(computing))

[Link – Instruction Set Architecture: https://en.wikipedia.org/wiki/Instruction_set_architecture](https://en.wikipedia.org/wiki/Instruction_set_architecture)

[Link – CPU: https://en.wikipedia.org/wiki/Central_processing_unit](https://en.wikipedia.org/wiki/Central_processing_unit)

[Link – Types of Buses: https://turbofuture.com/computers/buses](https://turbofuture.com/computers/buses)

[Link – Computer Memory: https://en.wikipedia.org/wiki/Computer_memory](https://en.wikipedia.org/wiki/Computer_memory)

[Link – Computer Organization: https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/](https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/)

[Link – How pipelined computers work: http://en.wikipedia.org/wiki/Computer_architecture](http://en.wikipedia.org/wiki/Computer_architecture)

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Module 3:

[Link – Computer Interface: https://en.wikipedia.org/wiki/Interface_\(computing\)](https://en.wikipedia.org/wiki/Interface_(computing))

[Link – Input-output: https://en.wikipedia.org/wiki/Input/output](https://en.wikipedia.org/wiki/Input/output)

[Link – Interrupt drive I-O: http://inputoutput5822.weebly.com/interrupt-driven-io.html](http://inputoutput5822.weebly.com/interrupt-driven-io.html)

[Link – direct memory access: https://en.wikipedia.org/wiki/Direct_memory_access](https://en.wikipedia.org/wiki/Direct_memory_access)

[Link – computer interrupts: https://en.wikipedia.org/wiki/Interrupt](https://en.wikipedia.org/wiki/Interrupt)

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[Link – disk storage: https://en.wikipedia.org/wiki/Disk_storage](https://en.wikipedia.org/wiki/Disk_storage)

[Link – RAID storage: https://en.wikipedia.org/wiki/RAID](https://en.wikipedia.org/wiki/RAID)

[Link – network storage: https://en.wikipedia.org/wiki/Network-attached_storage](https://en.wikipedia.org/wiki/Network-attached_storage)

[Link – computer peripherals: https://study.com/academy/lesson/what-are-peripheral-devices-of-a-computer-definition-examples-types.html](https://study.com/academy/lesson/what-are-peripheral-devices-of-a-computer-definition-examples-types.html)

[Link – computer peripherals 2: https://www.britannica.com/technology/input-output-device](https://www.britannica.com/technology/input-output-device)

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[Link – computer network: https://www.techopedia.com/definition/25597/computer-network](https://www.techopedia.com/definition/25597/computer-network)

[Link – networks: https://en.wikipedia.org/wiki/Computer_network](https://en.wikipedia.org/wiki/Computer_network)

[Link – communication channel: https://en.wikipedia.org/wiki/Communication_channel](https://en.wikipedia.org/wiki/Communication_channel)

[Link – network message passing: https://en.wikipedia.org/wiki/Message_passing](https://en.wikipedia.org/wiki/Message_passing)

[Link – network packet: https://en.wikipedia.org/wiki/Network_packet](https://en.wikipedia.org/wiki/Network_packet)

[Link – local area network: https://en.wikipedia.org/wiki/Local_area_network](https://en.wikipedia.org/wiki/Local_area_network)

[Link – wide area network: https://en.wikipedia.org/wiki/Wide_area_network](https://en.wikipedia.org/wiki/Wide_area_network)

[Link – network topologies: http://fcit.usf.edu/network/chap5/chap5.htm](http://fcit.usf.edu/network/chap5/chap5.htm)

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[Link – Ethernet: https://en.wikipedia.org/wiki/Ethernet](https://en.wikipedia.org/wiki/Ethernet)

[Link – TCP-IP: https://en.wikipedia.org/wiki/Internet_protocol_suite](https://en.wikipedia.org/wiki/Internet_protocol_suite)

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[Link – bandwidth: https://en.wikipedia.org/wiki/Bandwidth_\(computing\)](https://en.wikipedia.org/wiki/Bandwidth_(computing))

[Link – network transmission models: http://www.informit.com/articles/article.aspx?p=683070](http://www.informit.com/articles/article.aspx?p=683070)

[Link – transmission media: https://turbofuture.com/misc/Data-Communication](https://turbofuture.com/misc/Data-Communication)

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Module 4:

[Link – operating system: https://en.wikipedia.org/wiki/Operating_system](https://en.wikipedia.org/wiki/Operating_system)

[Link – active directory: https://en.wikipedia.org/wiki/Active_Directory](https://en.wikipedia.org/wiki/Active_Directory)

[Link – data files: https://en.wikipedia.org/wiki/Data_file](https://en.wikipedia.org/wiki/Data_file)

[Link – computer data storage: https://en.wikipedia.org/wiki/Computer_data_storage](https://en.wikipedia.org/wiki/Computer_data_storage)

[Link – file management system: https://www.globodex.com/globodex-articles/file-management-system/](https://www.globodex.com/globodex-articles/file-management-system/)

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[Link – operating systems: https://en.wikipedia.org/wiki/Operating_system](https://en.wikipedia.org/wiki/Operating_system)

[Link – virtual memory: https://en.wikipedia.org/wiki/Virtual_memory](https://en.wikipedia.org/wiki/Virtual_memory)

[Link – virtualization: https://en.wikipedia.org/wiki/Virtualization](https://en.wikipedia.org/wiki/Virtualization)

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[Link – Microsoft windows: https://en.wikipedia.org/wiki/Microsoft_Windows](https://en.wikipedia.org/wiki/Microsoft_Windows)

[Link – Unix: https://en.wikipedia.org/wiki/Unix](https://en.wikipedia.org/wiki/Unix)

[Link – Linux: https://en.wikipedia.org/wiki/Linux](https://en.wikipedia.org/wiki/Linux)

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[Link – programming languages: https://en.wikipedia.org/wiki/Programming_language](https://en.wikipedia.org/wiki/Programming_language)

[Link – list of programming languages: https://en.wikipedia.org/wiki/List_of_programming_languages](https://en.wikipedia.org/wiki/List_of_programming_languages)

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[Link – computer security: https://en.wikipedia.org/wiki/Computer_security](https://en.wikipedia.org/wiki/Computer_security)

[Link – cryptography: https://en.wikipedia.org/wiki/Cryptography](https://en.wikipedia.org/wiki/Cryptography)

[Link – cryptosystem: https://en.wikipedia.org/wiki/Cryptosystem](https://en.wikipedia.org/wiki/Cryptosystem)

[Link – PGP: https://en.wikipedia.org/wiki/Pretty_Good_Privacy](https://en.wikipedia.org/wiki/Pretty_Good_Privacy)

[Link – computer security software: https://en.wikipedia.org/wiki/Computer_security_software](https://en.wikipedia.org/wiki/Computer_security_software)

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[Discussions:](#)

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[Discussion 1:](#)

In chapter 3 - we studied number systems. Do you agree or disagree that we should study number systems in computing? Why are Binary and Hexadecimal so important in computing?

Discussion 2:

Why is it important to understand the basic ways in which pictures and video are stored in the computer?

Discussion 3:

Name at least one new advancement in networks over the last 5 years, and discuss why you think this has been an important addition to networks.

Discussion 4:

How has wi-fi changed the landscape of channel technology?

Discussion 5:

Do you think operating systems have changed much in the last 5 years? If so - how have they changed

Discussion 6:

Why is it important to know the different types of file organizations, and how they are stored and accessed?

**Kennesaw State University
Information Technology Department
IT 3123 Hardware/Software**

Instructor: Dr. Becky Rutherford

Office: Atrium Building J393

Email: brutherf@kennesaw.edu

Office Hours: by appointment (usually in my office unless in meetings)

Meeting Times: Tues 11:00Am – 1:45 pm in room J-262

Required Textbook: NONE

Online Free Textbook: Englander, Irv [The Architecture of Computer Hardware, Systems Software, and Networking: An Information Technology Approach, Fourth Edition](#). You will find a link to the online textbook in Module 0 – Start Here.

Credit Hours: 3 class hours; 0 lab hours; 3 credit hours.

Prerequisite: (IT 1324 or CSE 1302 or CS 1302) AND Corequisite: MATH 2345 or CSE 2300)

This course examines various hardware and software components and how they work together in a modern computing environment. Topics include an overview of computer organization and architecture, machine language and modern languages

Course outcomes:

Students will be able to:

1. Identify, use and convert binary, decimal, and hexadecimal number systems, describe common digital data formats, and describe fundamental digital logic circuits and their relationship to binary numbers.
2. Explain the relationship between digital logic and computation, describe the parts of a computer instruction, and explain the fetch-decode-execute instruction cycle.
3. Describe and use the components of a CPU, input/output hardware, peripherals, and digital communications and how they work. Apply the hierarchy of storage to explain how storage, data, and computation are related.
4. Describe the functions of an operating system and be able to compare various types of operating systems, including file management, cache and virtual memory, memory management, and security.
5. Use and differentiate between high-level, low-level and machine computer languages.

Course Information:

The free textbook, D2L content, links and other supplemental material will be the basis for all test taking and quizzes. You will have 8 quizzes, 6 discussions, 1 midterm and 1 final.

Course Schedule

Please take a look at the course schedule listed in D2L (*LivingScheduleSum18IT3123_Dr_R*). This will be our road map for the course and will show what topics will be covered and when. It will also list important dates such as: quiz due dates, exam dates, and scheduled university closures.

Exams

There will be 1 midterm and 1 final examination. Examinations will come from the questions from the quizzes – the midterm from quizzes 1-4, and the final from quizzes 5-8. You must take the exams on the dates in the syllabus unless you have made arrangements with me well in advance of the exam. Makeup examinations will not be given unless you make *prior* arrangements with me. In general, makeup examinations will only be allowed in cases of genuine emergency or exigent circumstances, such as serious illness. Requests for makeup exams for the convenience of the student will generally not be allowed.

Quizzes

Quizzes for this course will be administered using Desire2Learn and will be available approximately three days before the due date. They are open-book and open-notes, but *not* "open Internet." Why not? Well, there's a lot of misinformation and incomplete information on the web, and I don't want to put any into your heads through the quizzes. In any case, quizzes are timed, so you will not have much research time available.

Discussions

There will be 6 discussions in the course. You can earn up to 4 points total for each discussion. You receive points as follows:

- 4 points – you give your initial response to the question, then respond to 3 other classmates
- 3 points – you give your initial response to the question, then respond to 2 other class-mates

- 2 points – you give your initial response to the question, then respond to 1 other class-mate
- 1 point – you give your initial response only
- 0 points – you don't participate in the discussion

Discussions have due dates! Please check the calendar.

Due Dates

All work for this course will be submitted using Desire2Learn.

All discussions, quizzes and tests are due *at 11:59 PM* on the date shown in the syllabus or course calendar. Late assignments will be accepted for 48 hours after the due date for a penalty of 25%. Late exams will not be accepted and will be recorded as zeros. As university students, I expect you will manage your time well enough to be able to complete your assignments on time in spite of both usual and unanticipated events.

Grading Policy

Your final grade will be based on the number of points you earn during the semester.

8 Quizzes:	400 points	60% of grade
2 Exams:	200 points	30% of grade
6 discussions:	24 points	10% of grade
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Total:	624 points	

Your grading scale will be as follows:	561-624 points - "A"
	499-560 points - "B"
	437-498 points - "C"
	374-436 points - "D"
	0-373 points - "F"

Attendance & Participation policy:

Participation is expected. You are responsible for all material and announcements in the news tool and D2L email.

Electronic Communications

I will only respond to emails in D2L. Please don't send emails to my regular email account about the course. Other general emails, of course, can be sent to my regular email.

The University provides all KSU students with an "official" email account with the address "students.kennesaw.edu." As a result of federal laws protecting educational information and other data, **this is the sole email account you should use to communicate with your instructor or other University officials for questions NOT pertaining to this course. For the course communication – you may use the provided D2L email for our course**

General Expectations for Coursework in CCSE IT Programs

This course syllabus *is a general "plan" for the course and not a contract* - please know that the course instructor is permitted to make updates to it. If you have questions regarding this, please contact the Chair of the IT Department.

1. *Intellectual Property Issues.* You may not misappropriate the intellectual property of a member of the Faculty, another student, an online resource or other source even if you paid for them to do your work. Ideas, and course content are the intellectual property of the author irrespective of whether they are written in a book, course online content, course lectures or a paper. Kennesaw State University prohibits the misappropriation of intellectual property (which is a form of theft), which can result in discipline for a student, up to and including dismissal from the University. If the student is also a member of a profession with an applied code of ethics, it may additionally result in professional discipline, as well as subjecting the student to any civil legal remedies protecting intellectual property.
1. *Copyright Law.* It is the responsibility of KSU faculty and students to respect the rights of copyright holders and comply with copyright law. Students, faculty, and staff must comply with limited exclusive rights of copyright holders as set forth in 17 U.S.C. § 106, the application of the four fair use factors in 17 U.S.C. § 107, and other copyright exceptions.
1. *Electronic Recording.* You may not record or disseminate any electronically recorded class discussion unless given explicit permission by the instructor in writing. If a student needs to electronically record a course as a result of a recognized disability or other exceptionality, the student should contact the University's DisAbleD Student Support Services to develop an appropriate reasonable accommodation. http://www.kennesaw.edu/stu_dev/dsss/prospect.shtml

How to Succeed in this Class: Here are five things you can do that will greatly improve your chances of making a satisfactory grade in this class:

- **Read the syllabus:** It is *a lot of trouble* to prepare so detailed a syllabus. You should assume I had a reason for it. You should read *every word* in the syllabus before the second class. I will not be sympathetic to complaints that you didn't understand something about the course if it's written down in the syllabus.
- **Read the textbook:** You will get a lot more out of this class, and so be able to give back more on the assignments and examinations, if you read the assigned parts of the textbook *before* class. In my experience, students who don't complete the reading before class either never complete it or try to cram it all in just before the exams. That doesn't work.
- **Participate in the discussions:** Participation forms a part of your course grade. When you participate in the discussions, you learn and also help others learn. The printable slides are an integral part of the course. If you ignore them, you will learn less and probably earn a lower grade.

What I expect of You

- You will prepare for each session by having done the assigned reading.
- You will do your own work. There are severe penalties for cheating.
- You will complete your work on time.

What You May Expect of Me

- I will listen respectfully to your opinions.
- I will answer your questions promptly and carefully; if I do not know an answer, I'll find out.
- I will help you succeed.

COURSE WITHDRAWAL

Please refer to the KSU Catalog <http://www.kennesaw.edu/registrar/policies/withdrawl.php>

ACADEMIC INTEGRITY

Every KSU student is responsible for upholding all provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. The Code of Conduct includes the following:

- Section II of the Student Code of Conduct addresses the University's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to University materials, misrepresentation/falsification of University records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the University Judiciary Program, which includes either an "informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimum one semester suspension requirement.
- Students involved in off-campus activities shall not act in a disorderly or disruptive fashion, nor shall they conduct any dangerous activity.
- Students involved in off-campus activities shall not take, damage or destroy or attempt to take, damage or destroy property of another.
- **Collaboration with your classmates in studying and understanding the material is part of the collegiate experience, and is strongly encouraged. Collaboration on written assignments is permitted and encouraged, BUT each student must turn in their own original work written in his or her own words. Copying and submitting another's work will be considered cheating; all students involved will receive a grade of zero for the first offense. For a second offense, you will be given a grade of 'F' for the course.**
- **If you submit work obtained from a subscription service, you will receive a grade of 0 for the assignment and be docked a letter grade on your final grade for the first offense; a second offense will result in a grade of 'F' for the course. Unless you are specifically advised otherwise by the instructor, any work submitted for credit, including homework and lab assignments, must be completely the work of the individual student.**
- **Collaboration or cheating on examinations will result in a grade of zero for the exam and a reduction in the course grade. If this is not the first misconduct offense, you will be given a grade of 'F' for of the course and may be dismissed from the University.**

Reasonable Accommodations

Students with qualifying disabilities under the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act who require "reasonable accommodation(s)" to complete the course may request those from Office of Student Disability Services. Students requiring such accommodations are required to work with the University's Office of Student Disability Services not individual faculty members or academic departments. A student anticipating a need for accommodation, must submit documentation requesting an accommodation in a timely fashion to permit time for a determination prior to submitting assignments or taking course quizzes or exams. Students may not request retroactive accommodation. Students should contact the office as soon as possible in the term for which they are seeking accommodations. Student Disability Services is located in the Carmichael Student Center in Suite 267. For more information, please call 470-578-2666 or visit the Student Disabilities Services websites at

www.kennesaw.edu/stu_dev/sds

http://www.kennesaw.edu/stu_dev/dsss/dsss.html

Student Privacy (FERPA)

Students have certain rights to privacy. <http://registrar.kennesaw.edu/resources/ferpa.php>

The University's online learning system and email system are designed to prevent unauthorized individuals from gaining access to sensitive information or information protected by federal or state law. We will communicate regarding course matters through the University's designated technology learning system or Kennesaw state email system.

KSU Sexual Misconduct Policy & Ethics Statement

KSU will not tolerate sexual misconduct or sexually exploitative or harassing behavior of any kind. <https://policy.kennesaw.edu/content/sexual-misconduct-policy>.

You are expected to respect religious, cultural, and gender differences.

Netiquette: Communication Courtesy

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. Inappropriate communication will not be tolerated and will be reported to the Chair and Dean. It may result in dismissal from the course. Be respectful of your classmates.

KSU STUDENT RESOURCES

For issues with technical difficulties, please contact the **Student Helpdesk**:

- Email: studenthelpdesk@kennesaw.edu
- Call: 470-578-3555

*** Additional Technology Resources**

- [Student Service Desk and Help Center](#)
- [Browser Checker](#)
- [USG Desire2Learn Help Center](#)
- [ITS Documentation Center](#)
- [Check Service Outages](#)
- [Maintenance Schedule](#)

*** Academic Resources**

- [Academic Tutoring Services](#)
- [Disability Resources](#)
- [ESL Study and Tutorial Center](#)
- [Library](#)
- [The Writing Center](#)

*** Student Support and Wellness Resources**

- [Career Services Center](#)
- [Counseling and Psychological Services](#)
- [Center for Health, Promotion and Wellness Student Health Clinic](#)

Grade Appeals and Student Complaints

KSU desires to resolve student grievances, complaints and concerns in an expeditious, fair and amicable manner. For complaints regarding this course, please contact the professor. If the issue is not resolved, contact the department chair.