Round 16

ALG Final Report

Syllabi

IT 4603

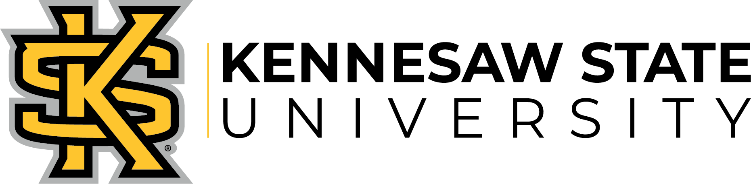
IT 4773

IT 4863

IT 4883

Becky Rutherfoord

Kennesaw State University



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| **IT4603 Introduction to FinTech in IT** |

# Meeting Times/Location

**Time:** Monday 5:00pm-6:15pm

**Location**: J215B

# Contact Information

**Name: Dr. Meng Han**

**Preferred Method of Contact:** **D2L Email**

**Email:** mhan9@kennesaw.edu \* Please use this for emergency only

**Phone:** 470-578-5801

**Office Location:** J-302

**Email:** Please feel free to reach out to me at any time. You can expect a response within 24 hours during business hours.

**Office Hours:** Monday 10am-12pm, Tuesday 10am-12pm or by appointments. Please feel free to reach out to me.

**Email and Classroom Response Time**:

Please contact me using **D2L Email** for all course related questions. I will check my D2L Email at least once a day, not including weekends or holidays. During the week, I generally respond to emails within 24 hours. Over the weekend (starting Friday at 4 p.m.) I will respond to emails the next following business day.

# Description

This course covers the foundation of FinTech application and innovation. Topics include but not limited to blockchain and cryptocurrencies, Bitcoin, Ethereum, smart contracts, decentralized applications, machine learning and its applications in FinTech, security and privacy concerns, operational risks as part of the FinTech transformation.

**Credit Hours:** 3

**Prerequisites:** Grade of C or better in CSE3153

# Objectives

## Students who complete this course successfully will be able to:

1. Describe the core and novel sources of FinTech data, how are they managed.
2. Compare critical technology strategies and foundational technologies in FinTech
3. Identify the differences between the most prominent blockchain structure.
4. Describe technologies underlying cryptocurrencies and blockchains.
5. Implement a blockchain, and how to write a “smart contract” in Python/Ethereum.

# Materials/Textbooks

## Course Website

D2L Brightspace: <https://kennesaw.view.usg.edu>

* It’s important to know how to use this learning management system for: following learning modules, submitting assignments, checking grades and feedback, downloading files, participating discussion boards, etc.
* Please check the course site regularly for important announcements and other issues.

## Learning Materials

* **Required Textbook**: **None**.
* Required readings (from different sources) will be assigned in each learning module.

We will heavily depend on class slides, notes, and reading materials, and the following textbooks are recommended:

* **Ethereum: Blockchains, Digital Assets, Smart Contracts, Decentralized Autonomous Organizations**

by Henning Diedrich, CreateSpace Independent Publishing Platform, ISBN-13: 978-1523930470.

* **Blockchain Applications: A Hands-on Approach**. by Arshdeep Bahga and Vijay Madisetti, Vpt, ISBN-13: 978-0996025560.

## Required Software/Hardware

* Code editor:
  + Visual Studio Code <https://code.visualstudio.com> (Recommended), or
  + Notepad++: <http://notepad-plus-plus.org/>
* Other software:
  + Software that can open and/or edit Word, PowerPoint, Excel, PDF, and ZIP files.

# Evaluation

Weighted by Percentage:

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| **Grading items** | **Weight** |
| FinTech group projects | 45% |
| Problem sets and quizzes | 40% |
| Attendance and Participation | 15% |
| Total | 100% |

## Grade Conversion

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

\*\*\* Detailed grading criteria are available in D2L for how Discussions and Projects will be graded. \*\*\*

# Course Outline

Below is an outline of the course content. Please refer to the D2L calendar for the due dates of assignments.

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| --- | --- |
| **Week** | **Topics** |
| **Week** 1 | **Course overview:**   * The FinTech opportunity to improve the financial system. * Recent developments, major areas, and potential issues with FinTech * Financial Innovation: Theory, History, Today |
| **Week** 2 | **Evolution of Blockchain**   * How and when blockchain/bitcoin started * Milestones on the development of bitcoin * Criticism, ridicule and promise of bitcoin, Sharing economy, Internet of Value |
| **Week** 3 | **Blockchain Foundation 1**:   * Brief history, and goals of cryptography * Symmetric-key cryptography, Public-key cryptography * Digital Signatures, Hash functions |
| **Week** 4 | **Blockchain Foundation 2**:   * Using hash functions to chain blocks * Digital Signatures to sign transactions * Using hash functions for Proof-of-Work |
| **Week** 5 | **Consensus Mechanisms**   * Distributed trust in data * Verifiers – trust, cost and speed * Byzantine agreement * Proof of work and other models |
| **Week** 6 | **Bitcoin and Other Cryptocurrencies**:   * Bitcoin, Ethereum, Other Altcoins * Wallets, Exchange Markets, Payments * Transaction Fees, Anonymity, Mining, Ecosystem |
| **Week** 7 | **Ethereum and Smart Contracts**:   * Ethereum platform * Smart Contracts * Decentralized Applications, DAOs |
| **Week** 8 | **Project Proposal Presentation** |
| **Week** 9 | **Ethereum Programming I:**   * Algorithmic Decision making * Ethereum protocol * Programing self-executing contracts in Python |
| **Week** 10 | **Ethereum Programming II:**   * Invited Lecture (Industry Speaker in FinTech) |
| **Week** 11 | **Smart Contracts and Blockchain Applications I:**   * Implementation of Smart Contracts * Description of blockchain projects, Open Discussion |
| **Week** 12 | **Smart Contracts and Blockchain Applications II:**   * Further examples of smart contracts and blockchain applications |
| **Week** 13 | **Artificial Intelligence and Applications:**   * Artificial Intelligence in FinTech |
| **Week** 14 | **Artificial Intelligence and Final Presentations**   * Further topics in Artificial Intelligence/Deep Learning |
| **Week** 15 | **Presentations of Final Projects I** |
| **Week** 16 | **Presentations of Final Projects II** |

Note: the schedule is tentative and subject to change. ALWAYS use the deadline in the D2L course calendar as the accurate deadline for the due items.

# Course Policies

## Announcement

Important announcements will be made to the class electronically through the D2L Announcements tool. It is important that you check your D2L account regularly for announcements, assignments, and course updates.

## Assignments, Quizzes, & Exams Policy

* All assignments MUST be submitted through D2L (https://kennesaw.view.usg.edu/) by the deadline. Email submissions are **NOT** accepted. Any assignment that is less than 24 hours late is subject to 10% penalty. Any assignment that is more than 24 hours late will **NOT** be accepted.
* All quizzes and/or exams MUST be completed on D2L website by the deadline. The quizzes and/or exams can’t be opened/submitted after the deadline.
* If you must miss an exam due to illness, you must e-mail or call the instructor before the scheduled time. Failure to notify the instructor prior the scheduled time will produce an automatic zero for the exam. NO makeup test except for emergencies with proof (e.g. doctor’s slip).

## Discussions

People learn through interactions, to facilitate interactive learning this course will use the Discussions feature in D2L. Discussions will take place in an **asynchronous** manner.

## Grading

Grades will be posted in D2L, generally within one week from the due date or submission date whichever is later. Significant assignments such as projects may take longer to grade. If you think there is an error, please make a re-grading request by e-mail within one week of grade posting. A request for reassessment will not be granted if more than two weeks have passed since the grade in question was posted. Please check your grades in D2L regularly.

**No “extra credit”** work will be given to improve one’s grade. Copies of your class work and test will be kept for record.

## Assignment Submission Guidelines

All work turned in for this class must meet the submission guidelines presented in the Start Here module. Work that does not meet the submission criteria will not be graded. Scoring rubric will be provided for each assignment.

## Attendance

Attendance in classes, laboratories and lectures is important. All students are expected to attend these activities in accordance with their schedule of courses. The instructor determines the attendance policy for each course. All instructors will provide the students, at the beginning of each semester, a clear statement regarding their policies in handling absences. Instructors will also be responsible for advising their students regarding the academic consequences of absences. To view the complete student attendance policy, please visit <http://catalog.kennesaw.edu/content.php?catoid=38&navoid=3019#attendancepolicy>**.**

**Enrollment Status Statement - Students are solely responsible for managing their enrollment status in a course; nonattendance does not constitute a withdrawal**.

# Institutional Policies

## Federal, BOR, & KSU Course Syllabus Policies

Information contained in the links below constitutes the Federal, BOR, and KSU course syllabus policies and procedures. These policies are updated on the Academic Affairs Website annually.

Academic Affairs - Federal, BOR, & KSU Policies (<http://curriculum.kennesaw.edu/resources/federal_bor_ksu_student_policies.php>)

Academic Affairs - KSU Student Resources (<http://curriculum.kennesaw.edu/resources/ksu_student_resources_for_course_syllabus.php>)

## Academic Integrity Statement

Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section 5c 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 Department of Student Conduct and Academic Integrity (SCAI), 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. See also KSU Student Code of Conduct (https://web.kennesaw.edu/scai/content/ksu student-code-conduct).

**Confidentiality and Privacy Statement (FERPA)**

Kennesaw State University adheres to the Family Educational Rights & Privacy Act of 1974 – FERPA. See the following link for more information:

[http://www.usg.edu/information\_technology\_handbook/section9/tech/9.5\_privacy\_and\_security](http://www.usg.edu/information_technology_handbook/section9/tech/9.5_privacy_and_security%20)

**University – Student Rights & Responsibilities**

Students of Kennesaw State University are entitled to an environment that is conducive to learning and individual growth. To this end, students enrolling at Kennesaw State University assume a responsibility to abide by the policies and regulations expressed in this section. By doing so, students may fulfill their responsibilities and enjoy the exercise of their own rights while also respecting the rights of others.

See <http://catalog.kennesaw.edu/content.php?catoid=27&navoid=2263>

**Ethics Statement**

All students are responsible for knowing the information, policies and procedures outlined in the Kennesaw State University Codes of Conduct. The KSU Codes of Conduct include: the general Student Code of Conduct, the Residential Code of Conduct, and the Code of Academic Integrity. Kennesaw State University reserves the right to make changes to this code as necessary and once those changes are posted online, they are in effect. Students are encouraged to check online for the updated versions of all policies.

See <https://scai.kennesaw.edu/codes.php>

**Sexual Misconduct Policy**

Kennesaw State University is committed to providing programs, activities, and educational environment free from all forms of sex discrimination. For more information click here. KSU issues this statement of policy to inform the community of the University's comprehensive plan addressing sexual misconduct, educational programs, and procedures that address sexual assault, domestic violence, dating violence, and stalking, whether the incident occurs on or off campus. This policy generally covers faculty, students, and staff of the University, as well as third-parties. Third parties include but are not limited to guests, vendors, contractors, retirees, and alumni.

Further information associated with this university policy can be found under sexual misconduct on the

Policy Portal website located at: https://policy.kennesaw.edu/

## Course Accessibility Statement (ADA statement)

Kennesaw State University provides program accessibility and reasonable accommodations for persons defined as disabled under Section 504 of the Rehabilitation Act of 1973 or the Americans with Disabilities Act of 1990 as amended. Students who require accommodation in facilities, services, programs or activities should contact the Assistant Director for Disabled Student Services to arrange an individual assistance plan. Accommodations may include classroom accessibility, modified computer equipment, disability-accessible parking, assistance with note-taking sign language interpreting or captioning services, class materials in alternate format, library and laboratory assistance, and other accommodations. Determination of appropriate accommodations to be provided will be based upon documentation of the disability. Members of the public who require specific accommodations in facilities, services, programs or activities should contact the office sponsoring the service, program or activity at least five days in advance to arrange individual accommodations. Eligible students deliver certification letters to faculty at the beginning of each semester identifying the accommodations approved for that student. Faculty members are also instructed that they must provide students with special needs appropriate accommodations in a timely manner. The Assistant Director for disAbled Student Support Services will work with faculty members to ensure that students receive appropriate accommodations. A student should notify Disabled Student Support Services in writing within two (2) days of any disagreement between the student and the faculty member if agreed upon academic adjustments are not provided in order to seek a resolution. A student who alleges discrimination on the basis of disability may file a grievance through the University's established grievance procedures. The following have been designated by the President of the University to provide assistance and ensure compliance with the ADA. Should a student require assistance or have further questions about the ADA, please contact either the ADA Compliance Officer for Students at 770-423-6443; the ADA Compliance Officer for Facilities at 470-578-6224; or the Director of Human Resources, ADA Compliance Officer for staff and faculty at 470-578-6030. For more information, go to kennesaw.edu/stu\_dev/dsss.

## Electronic Communication

The University provides all KSU students with an "official" email account with the address "students.kennesaw.edu" or "kennesaw.view.usg.edu" (in D2L). 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.

## Web Accessibility

Kennesaw State University follows the guidelines of the Universal Design for Learning standard of web accessibility. Faculty use Word, PDF, and HTML formats when communicating electronic information to students whenever possible and appropriate in light of the goals of the course. Faculty are trained to use Web Accessibility Evaluation tools, e.g., WAVE (www.wave.webaim.org), and make adjustments as possible and appropriate in light of the goals of the course.

For free resources available to students on web accessibility, please visit the Web Accessibility Resources page at the Distance Learning Center: [http://www.kennesaw.edu/dlc/facultyresources/index.php#](http://www.kennesaw.edu/dlc/facultyresources/index.php)

## Copyright Law

Kennesaw State University adheres to USG’s policy to respect the right of copyright. Holders and comply with copyright laws as set forth in the United States Copyright act. For more information, see the following link to USG’s policy: <http://www.usg.edu/copyright/>

## Electronic Recording and Social Media

Electronic recording performed without the consent of the people being recorded chills the free exchange of ideas. Academic freedom, free inquiry, and freedom of expression should not be limited by the fear that one’s brainstorming, polemic discourse, speculative inquiry, or any other kind of expressed curiosity made within the space of a university classroom will be made public without one’s consent. This fear is unacceptable regardless of whether one is in an online, hybrid, or face-to-face classroom setting. Accordingly, no person shall make public any electronically recorded class discussion without the written permission of the instructor. This policy is not intended to discourage electronic recording in the classroom or the use of social media when such actions are performed with the written consent of the instructor, and others as appropriate. Note: Faculty accommodate all reasonable requests to electronically record a class discussion; these requests must be documented by the Disabled Student Support Services available at: <http://www.kennesaw.edu/stu_dev/dsss/prospect.shtml>

# Additional Items

## Minimum Technology Requirements

* This class uses D2L as hosting site. Run a system check to ensure your computer work with D2L. Check out UITS D2L training: <http://uits.kennesaw.edu/support/d2ltraining.php>
* Internet Connection. A high-speed Internet connection such as DSL or cable Internet access is highly recommended. You can also computer labs on campus to complete the coursework.

## Minimum Technical Skills Required

Students entering this course are expected to have following technical skills:

* General computer literacy. Students should be proficient with the basic functions of standard software packages (e.g., MS Word, Excel, PowerPoint, and Adobe Reader) and standard players (e.g., QuickTime, Windows Media Player). A list of primers on many of these technologies is available at <https://apps.kennesaw.edu/portal/prod/app_uni_cdoc_publ/documents/>
* A working knowledge of the D2L learning management system is required for participation in online courses.

## Important Dates

* First Day of Classes:
* Breaks / Holidays:
* Last Day to Withdraw:
* Proctored Exam:
* Last Day of Classes:
* Graduation:

# Kennesaw State University Department of Information Technology

**IT 4773 Machine Learning for Enterprise Applications**

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| --- | --- |
| **Instructor** | Ying Xie |
| **Email** | [yxie2@kennesaw.edu](mailto:yxie2@kennesaw.edu) |
| **Office** | J -360 |
| **Office Hours** | TBD |
| **Credit Hours:** | 3-0-3 |
| **Pre- requisites:** | Grade of C or better in IT3703 Introduction to Data Analytics and Technologies |
| **Textbook:** | None  Instructor will design learning materials |
| **Course Description:** | This course covers enterprise applications of machine learning on data analytics.  Topics span the complete life cycle of data analytics from envisioning the problem, identifying proper data, selecting suitable machine learning methods, evaluating modeling performance, and deploying the results to improve decision-making. |
| **Learning Outcomes:** | The student will be able to:   1. explain the concepts of supervised and unsupervised learning 2. explain the concepts of how machine learning fits in the organization/enterprise and leads to competitive advantages. 3. Perform data analytics using supervised and unsupervised learning. 4. Evaluate the performance of machine learning models on data analysis. |
| **Weekly work** | |  |  | | --- | --- | | Week | Learning Module | | 1 | Intro to Machine Learning | | 2 | Machine Learning with Azure | | 3 | Developing a complete machine learning project | | 4 | Decision Tree and Random Forest | | 5 | Logistic Regression, Perceptron and Neural Network | | 6 | Support Vector Machine | | 7 | Clustering Analysis | | 8 | Enterprise applications of Machine Learning | | 9 | Retail forecasting based on time series data | | 10 | Machine Learning for controlling healthcare cost | | 11 | Predictive maintenance | |

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|  | |  |  | | --- | --- | | 12 | Machine Learning for IoT | | 13 & 14 | Course project development | | 15 | Project presentation | |
| **Assessment:** | Quizzes 20%  Assignments 30%  Course Project 30%  Discussion 20%  Total 100%  \*\*\*Detailed grading criteria are available in D2L for how Discussions will be graded.\*\*\* |
| **Grade** | A 90% - 100%  B 80% - 89% |
| **Evaluation:** | C 70% - 79% |
|  | D 60% - 69% |
|  | F 0% - 59% |
| **Class Format:** | The class will be hybrid or online |
| **Attendance:** | Students are required to follow weekly study guide to study all the provided course materials including lectures and reading materials, and work on quizzes, assignments and projects. |
| **Assignment Grading Policy:** | Successfully completed assignments, quizzes, projects and exams must satisfy their requirements outlined in the D2l module. The grade depends on the quality of the submission.  All work submitted is individual. For all assignments, if a student consults any resource (other than the text and class notes) including another individual, this consultation must be documented on the submission.  This documentation must include what (or who) was consulted and what information was obtained. Copying or plagiarizing from another source or failure to provide  this documentation will be considered a violation of the Student Code of Conduct. Due dates for submissions will be specified on the specific assignments Submissions will be accepted up to 24 hours late for 50% credit.  Submissions submitted more than 24 hours late will not be accepted for credit. |
| **Email Policy:** | Students must use only their official KSU email account since emails from other accounts may not successfully reach the instructor. |
| **Withdrawal Policy:** | **Withdrawal from Classes**  Students may withdraw from one or more courses up to one week prior to the last day of class. Summer withdrawal dates vary according to the part of term in which the student is enrolled. As of fall 2004, students will be allowed a maximum of eight total withdrawals if they enter KSU as a freshman.  Transfer students will be allowed one withdrawal per fifteen credit hours attempted, for a maximum of eight. Students who choose to pursue a second degree at KSU will be allowed two additional withdrawals. Students who entered KSU before fall 2004 will be allowed one withdrawal per fifteen credit hours attempted for a maximum of eight after the institution of this policy. As part of the consolidation process between Kennesaw State University and Southern Polytechnic State University, SPSU students will have eight withdrawals available beginning Fall Semester 2015.  Students who exceed the maximum number of withdrawals will receive a grade of "WF" for any subsequent withdrawals. To completely or partially withdraw from classes at KSU, a student must withdraw online through Owl Express. |

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|  | Students who officially withdraw from courses before the last day to withdraw without academic penalty will receive a grade of "W" and receive no credit. Students who officially withdraw after the last day to withdraw without academic penalty and before the last week of classes during the semester or who have exceeded the maximum number of withdrawals will receive a grade of "WF," which will be counted as an "F" in the calculation of their grade point average.  The only exceptions to these withdrawal regulations will be for instances involving unusual circumstances, which must be fully documented. Students may appeal to the Academic Standing Committee for consideration of unusual circumstances. Exact withdrawal dates are published in the official academic calendar. Students will receive refunds only when they withdraw from ALL their classes and only by the schedule outlined in the University System refund policy.  **Military Withdrawals**  Kennesaw State students who are called to active duty or who are deployed during the term may be eligible for a military withdrawal. Students who withdraw for military reasons will receive a WM grade in all courses and receive a refund of tuition and mandatory fees and a pro rata refund of other fees. Students who would like to withdraw for military reasons must submit a copy of their official orders to the Registrar's office. Military withdrawals do not count as part of the eight (maximum) allowed withdrawals. |
| **Classroom Behavior:** | Students are reminded to conduct themselves in accordance with the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Every KSU student is responsible for upholding the provision**.** Students who are in violation of KSU policy will be asked to leave the classroom and may be subject to disciplinary action by the University. |
| **Diversity Statement:** | All courses offered by the Computer Science department will adhere to the KSU policy that prohibits discrimination on the basis of race, religion, color, sex, age, disability, national origin, or sexual orientation. |
| **Enrollment Policy:** | Only those students who are enrolled in the class may attend lectures, receive assignments,  take quizzes and exams, and receive a grade in the class. If a student is administratively withdrawn from this course, they will not be permitted to attend class nor will they receive any grade for the class. |
| **Electronic Devices:** | In order to minimize the level of distraction, all cellular phones and electronic devices must be on quiet mode during class meeting times. Students who wish to use a computer of other electronic device for note taking need prior approval of the instructor since key clicks and other noises can distract other students. Recording of lectures by any method requires prior approval of the instructor. Students using a laptop in class should not check their email, browse the web, or in other way detract from the focus of the class. |
| **Academic Integrity Statement:** | Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. 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 are encouraged to study together and to work together on class assignments and lab exercises; however, the provisions of the STUDENT CONDUCT REGULATIONS, II. |

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|  | Academic Honesty, KSC Undergraduate Catalog will be strictly enforced in this class.  Frequently students will be provided with “take-home” exams or exercises. It is the  student’s responsibility to ensure they fully understand to what extent they may collaborate or discuss content with other students. No exam work may be performed with the assistance of others or outside material unless specifically instructed as permissible. If an exam or assignment  is designated “no outside assistance” this includes, but is not limited to, peers, books, publications, the Internet and the [WWW.](http://WWW/) If a student is instructed to provide citations for sources, proper  use of citation support is expected. |
| **Disruption of Campus Life Statement:** | It is the purpose of the institution to provide a campus environment, which encourages academic accomplishment, personal growth, and a spirit of understanding and cooperation. An important part of maintaining such an environment is the commitment to protect the health and safety of every member of the campus community. Belligerent, abusive, profane, threatening and/or inappropriate behavior on the part of students is a violation of the Kennesaw State University Student Conduct Regulations. Students who are found guilty of such misconduct may be subject to immediate dismissal from the institution. In addition, these violations of state law may also be subject to criminal action beyond the University disciplinary process*.* |
| **Faculty Availability Statement:** | KSU is proud of its reputation of faculty being available to students and colleagues outside of class time. To ensure this positive reputation continues, KSU expects its faculty to use a variety of means to be available for student questions or conferences as well as consultation with colleagues, including both in person and electronically. Departments must establish some minimum number of hours during each week that faculty should be available on campus beyond scheduled classes. The number of hours should reflect factors such as the number  and size of sections, the nature of those classes, and the number of advisees. Although faculties are not required to establish specific availability, they should be flexible in making appointments with students and colleagues. As a professional courtesy, faculty should reply to phone calls,  e-mails, and bulletin board questions from students in a timely manner. |
| **Reasonable Accommodati ons** | 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 <http://sds.kennesaw.edu/> |
| **Student Privacy (FERPA)** | Students have certain rights to privacy.  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.  <http://registrar.kennesaw.edu/ferpastudents.php> |
| **KSU Sexual Misconduct Policy & Ethics Statement** | KSU will not tolerate sexual misconduct or sexually exploitative or harassing behavior of any kind. You are expected to respect religious, cultural, and gender differences. https://policy.kennesaw.edu/content/sexual-misconduct-policy |

**KSU Student Resources**

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

* Email: [studenthelpdesk@kennesaw.edu](mailto:studenthelpdesk@kennesaw.edu)
* Call: 470-578-3555

# Additional Technology Resources

* Student Service Desk and Help Center: ["http:/](http://its.kennesaw.edu/students/index.html)/[its.kennesaw.edu/students/index.html"](http://its.kennesaw.edu/students/index.html)
* Browser Checker: "https://usg.desire2learn.com/d2l/tools/system\_check/systemcheck.asp?ou=6606"
* USG Desire2Learn: Help Center "https://d2lhelp.view.usg.edu/"
* ITS Documentation Center: "https://apps.kennesaw.edu/portal/prod/app\_uni\_cdoc\_publ/student/"
* Check Service Outages: ["http://status](http://status.usg.edu/).[usg.edu/"](http://status.usg.edu/)

# Academic Resources

* Maintenance Schedule ["http://ww](http://www.usg.edu/information_technology_services/learning_in_21st_century_georgia/georgiaview)w[.usg.edu/information\_technology\_services/learning\_in\_21st\_century\_georgia/georgiaview"](http://www.usg.edu/information_technology_services/learning_in_21st_century_georgia/georgiaview)
* Academic Tutoring Services ["http://www.kenne](http://www.kennesaw.edu/stu_dev/alp/academic.shtml)s[aw.edu/stu\_dev/alp/academic.shtml"](http://www.kennesaw.edu/stu_dev/alp/academic.shtml)
* Disability Resources ["http://www.kenne](http://www.kennesaw.edu/stu_dev/dsss/dsss.html)s[aw.edu/stu\_dev/dsss/dsss.html"](http://www.kennesaw.edu/stu_dev/dsss/dsss.html)
* ESL Study and Tutorial Center ["http:](http://www.kennesaw.edu/uc/esl/)/[/www.kennesaw.edu/uc/esl/](http://www.kennesaw.edu/uc/esl/)"
* Library ["http://ww](http://www.kennesaw.edu/library)w[.kennesaw.edu/library](http://www.kennesaw.edu/library)"
* The Writing Center ["ht](http://www.kennesaw.edu/writingcenter/index.php)t[p://www.kennesaw.edu/writingcenter/index.php"](http://www.kennesaw.edu/writingcenter/index.php)

# \* Student Support and Wellness Resources

* Career Services Center "https://careerctr.kennesaw.edu/"
* Counseling and Psychological Services ["http://sss](http://sss.kennesaw.edu/cps/).[kennesaw.edu/cps/"](http://sss.kennesaw.edu/cps/)
* Center for Health, Promotion and Wellness ["http://www.kenne](http://www.kennesaw.edu/col_hhs/wellness/)s[aw.edu/col\_hhs/wellness/"](http://www.kennesaw.edu/col_hhs/wellness/)
* Student Health Clinic K ["http://www](http://www.kennesaw.edu/col_hhs/hc/).[kennesaw.edu/col\_hhs/hc/"](http://www.kennesaw.edu/col_hhs/hc/)





SYLLABUS   
College of Computing and Software Engineering

Department of Information Technology

IT 4863: Web and Mobile Application Security

Fall 2021

# Course Information

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Class meeting time: TBD*.*

Modality and Location: TBD.

# Instructor

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**Name**: Hossain Shahriar

**E-mail**: [hshahria@kennesaw.edu](mailto:hshahria@kennesaw.edu)

**Office Location**: Marietta campus, Atrium building (J) 336

**Office Phone**: 470-578-3866

**Office Hours**: TBD

**Course Communication**:

# Email is the best way to reach the instructor. Use D2L email if possible. Instructor’s KSU email should only be used when you don’t have access to D2L site.

# Students’ emails will be replied WITHIN 24 hours during the weekday. Weekend and holidays don’t apply.

# When email the instructor using accounts other than D2L email, put the course number (IT 6823) in the subject line. Emails without proper subject line will not be replied.

# Avoid using personal email. Sensitive information (such as your grades) can ONLY be sent to D2L email or KSU email account.

# Course Description

****

**Prerequisites/Corequisites**: C or better in IT 3203

**Credit Hours:** 3-0-3

**Required Texts**: No textbook is required. Learning material will be provided in D2L course website

**Course Description:**

This course introduces web and mobile application security issues, hands-on practices to explore security vulnerabilities, best practices to defend against vulnerabilities in web and mobile

# Technology Requirements

****

* This class uses D2L as hosting site. Run a system check to ensure your computer work with D2L. Check out UITS D2L training: <http://uits.kennesaw.edu/support/d2ltraining.php> .
* Internet Connection. A high-speed Internet connection such as DSL or cable Internet access is highly recommended. You may also use computer labs on campus to complete the coursework.
* A web camera is required for a student to take quizzes/exams.

# Student Learning Outcomes

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Students who complete this course successfully will be able to

* Demonstrate how to manage network systems;
* Apply the various management strategies to managing networks;
* Describe concepts of network configuration management;
* Demonstrate skills in configuring specialized network security software

# Course Requirements and Assignment

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## The requirements of this course are listed as follows.

| Topic | Weight | Notes |
| --- | --- | --- |
| Assignments | 65% | There will be 7 assignments. As part of the assignments, students access/install specific software and tools on computers per instructions and complete hands-on activities. Brief outlines of the assignments are below.  Asg1- this assignment asks to review features of apache web server, and to configure to secure the server.  Asg2 – this assignment will do hands-on php examples on file inclusion vulnerability and prevent it with secure coding.  Asg3 - this assignment scans a website with kali linux-based tool like Nikto.  Asg4 - this assignment captures network traffic while running tor browser and analyze them in Wireshark.  Asg5 - this assignment builds a mobile application having input validation vulnerability, apply secure coding to prevent the vulnerability.  Asg6 - this assignment introduces content provider leakage through sqllite database in android application, and secure coding practice to prevent the leakage.  Asg7 - this assignment analyze android malware labs, and apply MobiSF framework to examine apk files for security risk assessment. |
| Discussions | 10% | There are 3 discussions related to the module topic materials. |
| Research paper | 25% | Research paper will cover in depth of one relevant topic for research on web/mobile security vulnerability and defense techniques, and paper writing; it can be done in group of 3-4 members; topics will be provided by the instructor. |

# Evaluation and Grading Policies

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## Weight Distribution

|  |  |
| --- | --- |
| **Grading Item** | **Points** |
| Writing Assignments (9) | 65% |
| Discussion (2) | 10% |
| Research paper | 25% |
| **Total** | **100%** |

## Grading Scale:

90% - 100% A

80% - 89% B

70% - 79% C

60% - 69% D

0% - 59% F

Grades will be rounded up if they are > or = .5 or above, for example, an 89.6 is an A, but 79.2 is a C.

# Course Policies

****

# Course Attendance Policy

* For on campus/hybrid section, students are expected to come to each class on time. Stay during the whole class period.
* For both campus/hybrid and online section, students’ attendance is also measured by how often a student login in D2L course website, participation of online discussion, as well as on-time completion of homework.

# Grading Items Turnaround Time

* The grades for the quizzes and midterm exam will be available immediately after the due dates
* The grades for assignments, discussions, research paper and final exam will be available 96 business hours after the due date

# Assignments & Exam Policy

* All assignments **MUST** be submitted through D2L (<https://kennesaw.view.usg.edu/> ) course website by the deadline specified in course calendar. Email submission will **NOT** be accepted. Any late assignment is subject to 10% penalty, for each day of late submission, unless notified to the instructor and agreed to submit late for reasonable excuses. Any assignment that is more than 1 week late will **NOT** be accepted.
* All quizzes and exams MUST be completed on D2L website by the deadline specified in course calendar. The quizzes and exams can’t be opened/submitted after the deadline.
* If you must miss an exam due to illness, you must e-mail or call the instructor before the scheduled time. Failure to notify the instructor prior to the scheduled time will produce an automatic zero for the exam. NO makeup test except for emergencies with proof (e.g. doctor’s slip).

**Student Responsibility**

For this class, you are expected to spend seven to eight hours each week on coursework:

* Check KSU email regularly;
* Login D2L course website frequently to access the course material (at least every other day);
* Follow the weekly study guide in the learning module;
* Study the assigned material such as virtual lectures, textbook chapters and the PowerPoint slides;
* Complete assigned quiz/assignment/discussion/project on time.

**Tips for Effective Online Learning**

For an online class, students can really enjoy the benefits of learning at you own pace and at the place of your choice. Below are some tips for effective online learning.

* *Check D2L course website frequently*. It’s recommended that students should login D2L course site **AT LEAST** every other day. Always be aware of current status of the course. Take advantage of the posted learning material such as recorded lectures.
* *Work with the instructor closely*. If you have any question, contact the instructor immediately. You can either email or text me and your message is guaranteed to be replied within 12 hours.
* *Start your work early*. If you can start a task early, don’t start late. Assuming you spend the same amount of time completing the task, starting later will be much more stressful than starting early. Never start until the last minute! You’ll have no turnaround time if you need help or something happens.
* *Keep up with the work*. Don’t fall behind. If you do, contact the instructor immediately for what you need to do. The instructor may also contact you if he is concerned. Respond to the instructor’s inquiry promptly.

**Class Communication Rules**

In any classroom setting there are communication rules in place that encourage students to respect others and their opinions. In an online environment, the do's and don'ts of online communication are referred to as **Netiquette**. As a student in my course you should:

* Be sensitive and reflective to what others are saying.
* **Avoid typing in all capitals** because it is difficult to read and is considered the electronic version of 'shouting'.
* Don't flame - These are outbursts of extreme emotion or opinion.
* Think before you hit the post (enter/reply) button. You can't take it back! Don't use offensive language.
* Use clear subject lines.
* Don't use abbreviations or acronyms unless the entire class knows them. Be forgiving. Anyone can make a mistake.
* Keep the dialog collegial and professional, humor is difficult to convey in an online environment.
* Always **assume good intent** and **respond accordingly**. If you are unsure of or annoyed by a message, wait 24 hours before responding.

# Course Schedule

The course schedule is tentative and is subject to change. Please use D2L course calendar as accurate due dates.

|  |  |  |
| --- | --- | --- |
| **Week** | **Topic** | **Assessment** |
| 1 | Module 1: Introduction to web server | Disc#1 |
| 2 | Module 1: Web server security | Asg1 |
| 3 | Module 2: OWASP Top10, Injection attack | Quiz1 |
| 4 | Module 2: Scanning web, discovering vulnerabilities  **Last day to withdraw without penalty** | Asg2 |
| 5 | Module 3: Web phishing, Web Single Sign on | Asg3 |
| 6 | Module 3: Web session security | Quiz2 |
| 7 | Module 4: Web tracking, Term project introduction | Disc#2 |
| 8 | Module 4: Anonymity on Web and TOR communication | Asg4 |
| 9 | Module 5: Mobile app security overview | Quiz3 |
| 10 | Module 5: Mobile App input and output data sanitization | Asg5 |
| 11 | Module 6: Mobile device security, content provider leakage | Asg6 |
| 12 | Module 6: IPC security, intent spoofing and eavesdropping, Android UI attack and mitigation | Disc#3 |
| 13 | Module 7: Android Malware, Static analysis, DroidPatrol |  |
| 14 | Module 7: Dynamic analysis, MobiSF | Asg7 |
| 15 | Fall Break (no lecture) |  |
| 16 | Review | Project -research paper |

**Institutional Policies**

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* [Federal, BOR, & KSU Course Syllabus Policies](https://cia.kennesaw.edu/instructional-resources/syllabus-policy.php)
* [Academic Integrity Statement](http://scai.kennesaw.edu/codes.php)
  + Examples of violation of academic integrity: 1) copy from others or from Internet; 2) allow others to copy your work; 3) use other’s help or help other in completing the quizzes or exams.
  + The first violation of academic integrity, the student will immediately receive 0 for the associated grading item. For the 2nd violation, the student will receive a fail grade for this course.

**KSU Statements on COVID-19**

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**Face Masks in The Classroom**

As mandated by the University System of Georgia, the university requires the use of face masks in the classroom and in KSU buildingsto protect you, your classmates, and instructors.  Per the University System of Georgia, anyone not using a face covering when required will be asked to wear one or must leave the area. Repeated refusal to comply with the requirement may result in discipline through the applicable conduct code.

Reasonable accommodations may be made for those who are unable to wear a face covering for documented health reasons. Please contact Student Disability Services at sds@kennesaw.edu for student accommodation requests.

**Shifting Modalities**

Please note that the university reserves the right to shift teaching modalities at any time during the semester, if health and safety guidelines require it to do so.  Some teaching modalities that may be used are F2F, Hyflex, Hybrid, or online, both synchronous and asynchronous instruction.

**Staying Home When Sick**

If you are ill, please stay home and contact your health professional.  In that case, please email the instructor to say you are missing class due to illness. Signs of illness include, but are not limited to, the following:

* Cough
* Fever of 100.4 or higher
* Runny nose or new sinus congestion
* Shortness of breath or difficulty breathing
* Chills
* Sore Throat
* New loss of taste and/or smell

**Seating Plans**

Students will sit in the same seat for every F2F class so that the instructor can use a seating plan for contact tracing if a student contract Covid-19.

# Student Resources

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This link contains information on help and resources available to students: [KSU Student Resources for Course Syllabus](https://curriculum.kennesaw.edu/resources/ksu_student_resources_for_course_syllabus.php)





SYLLABUS   
College of Computing and Software Engineering

Department of Information Technology

IT 4883: Infrastructure Defense

Spring 2021

# Course Information

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Class meeting time: TBD*.*

Modality and Location: TBD.

# Instructor

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**Name**: Seyedamin Pouriyeh

**E-mail**: [spouriye@kennesaw.edu](mailto:spouriye@kennesaw.edu)

**Office Location**: Marietta campus, Atrium building (J) 391

**Office Phone**: 470-578-6901

**Office Hours**: TBD

**Course Communication**:

# Email is the best way to reach the instructor. Use D2L email if possible. Instructor’s KSU email should only be used when you don’t have access to D2L site.

# Students’ emails will be replied WITHIN 24 hours during the weekday. Weekend and holidays don’t apply.

# When email the instructor using accounts other than D2L email, put the course number (IT 6823) in the subject line. Emails without proper subject line will not be replied.

# Avoid using personal email. Sensitive information (such as your grades) can ONLY be sent to D2L email or KSU email account.

# Course Description

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**Prerequisites/Corequisites**: IT 4323: Data Communications & Networking or equivalent.

**Credit Hours:** 3-0-3

**Required Texts**: No textbook is required. Learning material will be provided in D2L course website

**Recommended Texts**: None.

**Course Description:**

This course provides an overview of the infrastructure assessment and penetration testing process and the processes and techniques for improving the defensibility of that infrastructure.

# Technology Requirements

****

* This class uses D2L as hosting site. Run a system check to ensure your computer work with D2L. Check out UITS D2L training: <http://uits.kennesaw.edu/support/d2ltraining.php> .
* Internet Connection. A high-speed Internet connection such as DSL or cable Internet access is highly recommended. You may also use computer labs on campus to complete the coursework.
* A web camera is required for a student to take quizzes/exams.

# Student Learning Outcomes

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Upon a successful completion of this course, a student should be able to:

## Define the overall process of infrastructure assessment

## Describe the goals of a penetration test

## Identify and Explain the processes and techniques for mitigating risks identified in an infrastructure assessment

* Explain the goals and content for communicating the results of a penetration test and remediation plan to a managerial audience.

# Course Requirements and Assignment

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## The requirements of this course are listed as follows.

## Assignments*:* There are 6 assignments.

**Exams**: There are two exams: midterm and final. Midterm exam is multiple choice questions. Final exam is comprehensive and is composed of a list of short-answer or problem-solving questions.

**Research paper**: this is a team project where 3 or 4 students work together to conduct an in-depth research on a focus area of information security domain.

The weight distribution of the grading items is listed in the section below.

# Evaluation and Grading Policies

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## Weight Distribution

|  |  |  |
| --- | --- | --- |
| **Assignments, final exam, research project weights in percentage.** | | |
| **Topic** | **Weight** | **Notes** |
| Labs/Assignments | 30% | There are six assignments. Each one worth 5 points. |
| Mid-term and final Exams | 40% | Mid-term and finale Exams are listed on the course calendar with their respective due dates. Mid-term and finale Exams will not be accepted after the due date listed on the course calendar. Exams may require the use of the Respondus LockDown Browser which will require the use of a working webcam and microphone for proctoring. |
| Research proposal | 5% | Students need to work in a group of 3 to 4 and complete a research project. Each group proposes a research proposal covering the project topic, problem statement and the possible approach.  A research proposal template will be provided on D2L course site. One submission per team. |
| Final Report | 25% | Instructions on how to write a research paper and sample research paper will be provided on D2L course site.  One submission per team. |
| Total | 100% |  |

## Grading Scale:

90% - 100% A

80% - 89% B

70% - 79% C

60% - 69% D

0% - 59% E

Grades will be rounded up if they are > or = .5 or above, for example, an 89.6 is an A, but 79.2 is a C.

# Course Policies

****

# Course Attendance Policy

* Students are expected to come to each class on time. Stay during the whole class period.
* Students’ attendance is also measured by how often a student login in D2L course website, participation of online discussion, as well as on-time completion of homework.

# Grading Items Turnaround Time

* The grades for the quizzes and midterm exam will be available immediately after the due dates
* The grades for assignments, discussions, research paper and final exam will be available 96 business hours after the due date

# Assignments & Exam Policy

* All assignments **MUST** be submitted through D2L (<https://kennesaw.view.usg.edu/> ) course website by the deadline specified in course calendar. Email submission will **NOT** be accepted. Any assignment that is less or equal than 24 hours late is subject to 10% penalty. Any assignment that is less or equal than 48 hours late is subject to 20% penalty. Any assignment that is more than 48 hours hours late will **NOT** be accepted.
* All quizzes and exams MUST be completed on D2L website by the deadline specified in course calendar. The quizzes and exams can’t be opened/submitted after the deadline.
* If you must miss an exam due to illness, you must e-mail or call the instructor before the scheduled time. Failure to notify the instructor prior to the scheduled time will produce an automatic zero for the exam. NO makeup test except for emergencies with proof (e.g. doctor’s slip).

**Proctored Exam**

Respondus Lockdown Browser + Web Camera will be used for the final exam. LockedDown Web Browser Student Guide: <https://apps.kennesaw.edu/files/pr_app_uni_cdoc/doc/D2L_Brightspace_Quizzes_LockDown_Browser_Dashboard_Faculty_Guide.pdf>

A student must have a web camera in order to complete the final exam. Please contact the instructor if you have any questions.

**Student Responsibility**

For this class, you are expected to spend seven to eight hours each week on coursework:

* Check KSU email regularly;
* Login D2L course website frequently to access the course material (at least every other day);
* Follow the weekly study guide in the learning module;
* Study the assigned material such as virtual lectures, textbook chapters and the PowerPoint slides;
* Complete assigned quiz/assignment/discussion/project on time.

**Tips for Effective Online Learning**

For an online class, students can really enjoy the benefits of learning at you own pace and at the place of your choice. Below are some tips for effective online learning.

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* *Work with the instructor closely*. If you have any question, contact the instructor immediately. You can either email or text me and your message is guaranteed to be replied within 12 hours.
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* Don't flame - These are outbursts of extreme emotion or opinion.
* Think before you hit the post (enter/reply) button. You can't take it back! Don't use offensive language.
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* Keep the dialog collegial and professional, humor is difficult to convey in an online environment.
* Always **assume good intent** and **respond accordingly**. If you are unsure of or annoyed by a message, wait 24 hours before responding.

# Course Schedule

The course schedule is tentative and is subject to change. Please use D2L course calendar as accurate due dates.

|  |  |  |
| --- | --- | --- |
| **Week** | **Module** | **Assessment** |
| Week 1 | Module 01: Introduction, Risk Management |  |
| Week 2 | Module 02: Security Analysis & Design | Homework 1 |
| Week 3 | Module 02: Security Analysis & Design |  |
| Week 4 | Module 03: Secure Network Infrastructure | Homework 2 |
| Week 5 | Module 04: Penetration Testing | Homework 3 |
| Week 6 | Module 05: Intrusion Detection & Prevention Systems | Homework 4 |
| Week 7 | Review | Mid-term exam, Research project proposal |
| Week 8 | Module 06: Wireless Security Infrastructure  **Add/drop deadline without academic penalty** | Homework 5 |
| Week 9 | Module 07: Blockchain | Homework 6 |
| Week 10 | Module 08: Log Analysis |  |
| Week 11 | Module 09: Social Engineering |  |
| Week 12 | Module 10: Malicious Code |  |
| Week 13 | Module 11: Cyber Security Assessment |  |
| Week 14 | Working on research project |  |
| Week 15 | Review | Research project final report & Final exam |

**Institutional Policies**

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* [Academic Integrity Statement](http://scai.kennesaw.edu/codes.php)
  + Examples of violation of academic integrity: 1) copy from others or from Internet; 2) allow others to copy your work; 3) use other’s help or help other in completing the quizzes or exams.
  + The first violation of academic integrity, the student will immediately receive 0 for the associated grading item. For the 2nd violation, the student will receive a fail grade for this course.

**KSU Statements on COVID-19**

****

**Face Masks in The Classroom**

As mandated by the University System of Georgia, the university requires the use of face masks in the classroom and in KSU buildingsto protect you, your classmates, and instructors.  Per the University System of Georgia, anyone not using a face covering when required will be asked to wear one or must leave the area. Repeated refusal to comply with the requirement may result in discipline through the applicable conduct code.

Reasonable accommodations may be made for those who are unable to wear a face covering for documented health reasons. Please contact Student Disability Services at sds@kennesaw.edu for student accommodation requests.

**Shifting Modalities**

Please note that the university reserves the right to shift teaching modalities at any time during the semester, if health and safety guidelines require it to do so.  Some teaching modalities that may be used are F2F, Hyflex, Hybrid, or online, both synchronous and asynchronous instruction.

**Staying Home When Sick**

If you are ill, please stay home and contact your health professional.  In that case, please email the instructor to say you are missing class due to illness. Signs of illness include, but are not limited to, the following:

* Cough
* Fever of 100.4 or higher
* Runny nose or new sinus congestion
* Shortness of breath or difficulty breathing
* Chills
* Sore Throat
* New loss of taste and/or smell

**Seating Plans**

Students will sit in the same seat for every F2F class so that the instructor can use a seating plan for contact tracing if a student contract Covid-19.

# Student Resources

****

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