NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

COURSE SYLLABUS

College Name: College of Engineering

Department Name: Computational Data Science and Engineering

Course Name: Applied Probability and Statistics

COURSE INFORMATION

- Course Number/Section: CSE 701
- Term: Fall 2021
- Semester Credit Hours: 3
- Times and Days: 2:00 pm – 3:15 pm Tuesday and Thursday
- Class Location: TBA

INSTRUCTOR CONTACT INFORMATION

- Instructor: Dr. AKM Kamrul Islam
- Office Location: Fort IRC 342
- Office Phone: 470-658-6762
- Email Address: akislam@ncat.edu

Faculty must notify students of the approximate time and method they can expect to receive an answer to all communications (e.g., email, phone, course messages). Excluding holidays, the response should be provided within 48 hours.

If there is a graduate teaching assistant assigned to work with this course, please include their names(s).

STUDENT HOURS

These are times students may visit the professor without an appointment to request the assistance they need.

NOTE: Students are responsible for reading, understanding and following the syllabus.

3:30 PM -- 4:30 PM These are times you may visit your professor without an appointment to request the assistance that you need

Monday ☐ Tuesday ☒ Wednesday ☐ Thursday ☒ Friday ☐

COURSE PREREQUISITES

CSE700/CSE620: Introduction to Computational Science or equivalent or Permission of the instructor.

COURSE DESCRIPTION

This course examines various concepts and tools for theoretical probability and statistics, as well as computational implementation of probability and statistics as related to real-world and hypothetical scenarios.

STUDENT LEARNING OBJECTIVES/OUTCOMES (SLO)

Learning outcomes should be specific, measurable and focused on the content knowledge the students are expected to master and not what the faculty will teach.

If the course is a General Education Course, the SLO should be listed and labeled as "General Education."

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Upon completing this course, students will:

Be able to apply fundamentals of Probability Theory and its practical applications.

Be able to apply fundamentals of Statistical Theory and its practical applications.

Be able to summarize and interpret data and infer relationships betweens in components.

Utilize computation tools to analyze data using learn probability and statistics techniques.

Perform accurate design of experiments and analyses to describe presented research project.

REQUIRED TEXTBOOKS AND MATERIALS

Any course-level subscriptions and tools linked in Blackboard Learn learning management system (LMS) should be listed here. The Blackboard LMS must have links to their student data privacy statement.

REQUIRED TEXTS:

The Analysis of Biological Data by Whitlock and Schluter, Roberts and Company. Publishers, ISBN: 0-981-51940-7.

REQUIRED MATERIALS:

Supplemental readings will be utilized in this course. The reading material will be accessible through campus resources. Lecture notes will be made available. Computational technologies are to be downloaded and installed by each student.

SUGGESTED COURSE MATERIALS

SUGGESTED READINGS/TEXTS:

Clean Code by Robert Martin

SUGGESTED MATERIALS:

In Class Materials and Notes

GRADING POLICY

ASSIGNMENTS AND GRADING POLICY

94% and above	A		76% - 74%	C
93% - 90%	A-		73% - 70%	C-
89% - 87%	B+		69% - 67%	D+
86% - 84%	B		66% - 64%	D
83% - 80%	B-		63% - 0%	F
79% - 77%	C+			

For GRADUATE COURSES: See 2020-2021 Graduate Catalog p.38 for graduate grading scale and Non-Graded Courses

GRADING ALLOCATION

Course grades are based on a weighted grading scale of 100%. The breakdown for the course is as follows: *[Faculty, please adjust according to your course.]*

Category	# of Activities	Percentage Grade Weight
Homework or Assignments	4	25%
In Class Quiz	10	10%
Midterm Exam	1	25%
Final Exam	1	25%
Final Project	1	15%
Total		**100%**

COURSE POLICIES

USE OF BLACKBOARD AS THE LEARNING MANAGEMENT SYSTEM

Blackboard is the primary online instructional and course communications platform. Students can access the course syllabus, assignments, grades, and learner support resources. Students are encouraged to protect their login credentials, complete a Blackboard orientation and log in daily to course.

Note: Uploading assignments through Blackboard presents a challenge for Chromebook users in locating the files for submission. If you use a Chromebook, please be sure you also have access to a Mac computer or Windows computer so you can fully participate in your Blackboard class. For more information about student computer recommendations, please visit https://hub.ncat.edu/administration/its/computer-recommendations.php.

MAKE-UP EXAMS

Make-up exams will be given according to university policy.

See << Update Academic Year >>*Undergraduate Bulletin:*

https://www.ncat.edu/provost/academic-affairs/bulletins/index.php

For GRADUATE STUDENTS: See 2020-2021 Graduate Catalog p. 54

EXTRA CREDIT

There will be opportunities for Extra Credit throughout the course.

LATE WORK

Late work will be accepted if submitted with a valid university justification. Students are expected to make every effort to meet all deadlines. Students are expected to make all reasonable efforts to present advanced notice of pending tardiness or absence. All students are welcome to communicate any difficulty with meeting deadlines.

SPECIAL ASSIGNMENTS

Special Assignments will be given at the discretion of the instructor and will count towards possible extra credit.

For GRADUATE STUDENTS: FAILING TO MEET COURSE REQUIREMENTS (Graduate Catalog p.40)

For GRADUATE STUDENTS: CLASS ATTENDANCE (see 2020-2021 Graduate Catalog p. 54-55)

Students are expected to attend class and participate on a regular basis in order to successfully achieve course learning outcomes and meet federal financial aid requirements (34 CFR 668.22). Class attendance in online courses is defined as active participation in academically-related course activities. Active participation may consist of course interactions with the content, classmates, and/or the instructor. Examples of academically-related course activities include, but are not limited to:

- Completing and submitting assignments, quizzes, exams, and other activities within Blackboard or through Blackboard (3rd-party products).
- Participating in course-related synchronous online chats, discussions, or meeting platforms such as Blackboard Collaborate in which participation is tracked.

CLASSROOM CITIZENSHIP

Courtesy, civility and respect must be the hallmark of your interactions.

COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT

North Carolina A&T State University (N.C. A&T) is committed to following the requirements of the Americans with Disabilities Act Amendments Act (ADAAA) and Section 504 of the Rehabilitation Act.
If you need an academic accommodation based on the impact of a disability, you must initiate the request with the Office of Accessibility Resources (OARS) and provide documentation in accordance with the Documentation Guidelines at N.C. A&T. Once documentation is received, it will be reviewed. Once approved, you must attend a comprehensive meeting to receive appropriate

and reasonable accommodations. If you are a student registered with OARS, you must complete the Accommodation Request Form to have accommodations sent to faculty.

OARS is located in Murphy Hall, Suite 01 and can be reached at 336-334-7765, or by email at accessibilityresources@ncat.edu. Additional information and forms can be found on the internet at https://www.ncat.edu/provost/academic-affairs/accessibility-resources/index.php.

Please note: Accommodations are not retroactive and begin once the Disability Verification Form is provided to faculty.

TITLE IX

North Carolina A&T State University is committed to providing a safe learning environment for all students—free of all forms of discrimination and harassment. Sexual misconduct and relationship violence in any form are inconsistent with the university's mission and core values, violate university policies, and may also violate federal and state law. Faculty members are considered "Responsible Employees" and are required to report incidents of sexual misconduct and relationship violence to the Title IX Coordinator. If you or someone you know has been impacted by sexual harassment, sexual assault, dating or domestic violence, or stalking, please visit the Title IX website to access information about university support and resources https://www.ncat.edu/legal/title-ix/index.php. If you would like to speak with someone confidentially, please contact the Counseling Services at 336-334-7727 or the Student Health Center at 336-334-7880.

TECHNICAL SUPPORT

If you experience any problems with your N.C. A&T account, you may call Client Technology Services (formerly Aggie Tech Support and Help Desk) at 336-334-7195, or visit https://hub.ncat.edu/administration/its/dept/ats/index.php.

FIELD TRIP POLICIES / OFF-CAMPUS INSTRUCTION AND COURSE ACTIVITIES

If applicable:

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and university policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at https://www.ncat.edu/campus-life/student-affairs/index.php.

STUDENT HANDBOOK

https://www.ncat.edu/campus-life/student-affairs/departments/dean-of-students/student-handbook.php

STUDENT TRAVEL PROCEDURES AND STUDENT TRAVEL ACTIVITY WAIVER

https://hub.ncat.edu/administration/student-affairs/staff-resources/studen_activity_travel_waiver.pdf

OTHER POLICIES *(e.g., Copyright Guidelines, Confidentiality, etc.)*

STUDENT HANDBOOK

https://www.ncat.edu/campus-life/student-affairs/departments/dean-of-students/student-handbook.php

Graduate Catalog

SEXUAL MISCONDUCT POLICY

https://www.ncat.edu/legal/title-ix/sexual-harassment-and-misconduct-policies/index.php

FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT (FERPA)

https://www.ncat.edu/registrar/ferpa.php

STUDENT COMPLAINT PROCEDURES

https://www.ncat.edu/current-students/student-complaint-form.php

STUDENT CONDUCT AND DISCIPLINE

North Carolina A&T State University has rules and regulations that govern student conduct and discipline meant to ensure the orderly and efficient conduct of the educational enterprise. It is the responsibility of each student to be knowledgeable about these rules and regulations.

Please consult the following about specific policies such as academic dishonesty, cell phones, change of grade, disability services, disruptive behavior, general class attendance, grade appeal, incomplete grades, make up work, student grievance procedures, withdrawal, etc.:

- Undergraduate Bulletin
  https://www.ncat.edu/provost/academic-affairs/bulletins/index.php
- Graduate Catalog
  https://www.ncat.edu/tgc/graduate-catalog/index.php
- Student Handbook
  https://www.ncat.edu/campus-life/student-affairs/departments/dean-of-students/student-handbook.php

ACADEMIC DISHONESTY POLICY

Academic dishonesty includes but is not limited to the following:

1. Cheating or knowingly assisting another student in committing an act of cheating or other academic dishonesty;
2. Plagiarism (unauthorized use of another's words or ideas as one's own), which includes but is not limited to submitting exams, theses, reports, drawings, laboratory notes or other materials as one's own work when such work has been prepared by or copied from another person;
3. Unauthorized possession of exams or reserved library materials; destroying or hiding source, library or laboratory materials or experiments or any other similar actions;
4. Unauthorized changing of grades, or marking on an exam or in an instructor's grade book or such change of any grade record;
5. Aiding or abetting in the infraction of any of the provisions anticipated under the general standards of student conduct;
6. Hacking into a computer and gaining access to a test or answer key prior to the test being given. N.C. A&T reserves the right to search the emails and computers of any student suspected of such computer hacking if a police report of the suspected hacking was submitted prior to the search; and

7. Assisting another student in violating any of the above rules.

A student who has committed an act of academic dishonesty has failed to meet a basic requirement of satisfactory academic performance. Thus, academic dishonesty is not only a basis for disciplinary action but may also affect the evaluation of a student's level of performance. Any student who commits an act of academic dishonesty is subject to disciplinary action.

In instances where a student has clearly been identified as having committed an act of academic dishonesty, an instructor may take appropriate disciplinary action, including a loss of credit for an assignment, exam or project; or awarding a grade of "F" for the course, **subject to review and endorsement by the chairperson and dean**.

For GRADUATE STUDENTS: Reference for academic dishonesty – 2021-2021 Graduate Catalog, p.59

For GRADUATE STUDENTS: STUDENT RELIGIOUS OBSERVANCE (see Graduate Catalog, p.55)

ASSIGNMENTS AND ACADEMIC CALENDAR

Include topics, reading assignments, due dates, exam dates, withdrawal dates, pre-registration and registration dates, all holidays and convocations.*

The Week of MM/DD/YY	SUBJECT	Unit Learning Objectives	READING IN TEXT, ACTIVITY, HOMEWORK, EXAM
Week 1	Introduction, Sample Space, Probability Axioms, Theorems on Union, and Intersections of events in a Sample Spaces. Bertrand's Paradox		Quiz 1
Week 2	Conditional Probability, Bayes Theorem, Probability on Finite Sample Spaces. Independence of Events		Quiz 2

The Week of MM/DD/YY	SUBJECT	Unit Learning Objectives	READING IN TEXT, ACTIVITY, HOMEWORK, EXAM
Week 3	Introduction to Random variables – discrete & continuous Random variables Discrete random variables - Uniform, Bernoulli, Binomial, Geometric, Poisson Distributions, Hypergeometric, Negative Binomial		Quiz 3 Homework 1
Week 4	Continuous Random variables: Uniform, Normal, Exponential, Gamma, Cauchy, Beta1 and Beta2		Quiz 4
Week 5	Moments of a distribution, Bivariate distribution, Covarience and Correlation		Quiz 5 Homework 2
Week 6	Generating Functions and their properties: Moment Generating Function Characteristic Functions and Probability Generating Function		Midterm
Week 7	Poisson Process, Conditional Expectations and Variance, Chebyshev's Inequality and Introduction to Bivariate Normal.		Quiz 6
Week 8	Functions of Random Variables, Introduction to t and F distribution.		Quiz 7
Week 9	Order Statistics		Quiz 8 Homework 3
Week 10	Limit Theorems: Mode of Convergence		Quiz 9
Week 11	Laws of Large numbers		Quiz 10

The Week of MM/DD/YY	SUBJECT	Unit Learning Objectives	READING IN TEXT, ACTIVITY, HOMEWORK, EXAM
Week 12	Central Limit Theorems		Quiz 11 Homework 4
Week 13	Revising the research paper; incorporating source materials correctly and effectively		Quiz 12
Week 14	Proof-reading and editing Final Draft of Research Paper due		Presentation
Week 15	Final Exam		Final Exam

** These descriptions and timelines are subject to change at the discretion of the instructor.*