



EAST TEXAS A&M UNIVERSITY

MATH 341–01E: Statistical Modeling COURSE SYLLABUS: Fall 2026

Instructor Information

Instructor: Dr. K.D. Gayan Maduranga

Office Location: Young Education North, 104D

Office Hours: Monday and Wednesday, 12:00 PM–2:30 PM; and by appointment

Office Phone: 903-886-5972

Office Fax: 903-886-5945

University Email: Gayan.Maduranga@etamu.edu

Preferred Communication: University email

Communication Response Time: Usually within 24 hours on weekdays, Monday–Friday.

Please use your East Texas A&M University email account for course communication. Include MATH 341–01E and a brief purpose in the subject line (for example, “MATH 341, Question about R Lab 2”).

Course Information

CRN: 84856

Credit Hours: 3

Level: Undergraduate

Schedule Type: Lecture

Term Dates: August 20–December 11, 2026

Campus: Main Campus

Class Meeting: Tuesday and Thursday, 12:30 PM–1:45 PM

Location: Young Education North 108

Materials – Textbooks, Readings, and Supplementary Resources

- **Primary textbook:** J. Susan Milton and Jesse C. Arnold, *Introduction to Probability and Statistics*, 4th ed. Primary course coverage will draw especially from Chapters 11–12.
- **Free supplementary resource:** *OpenIntro Statistics*, a free supplementary resource. Selected material from Chapters 8–9 and accompanying R resources will be used when helpful. [OpenIntro Statistics](#).
- **Additional readings/materials:** Instructor lecture notes, worked examples, R demonstrations, data sets, and supplementary notes on regression diagnostics, model selection, and multicollinearity posted in the LMS.
- **Required software:** The statistical software R will be used throughout the course for fitting, diagnosing, comparing, and interpreting regression models. Download R from the [R Project](#). Students may use RStudio as an interface for R.

Planned textbook emphasis: Milton and Arnold Chapters 11–12 will provide the principal mathematical development of simple and multiple linear regression. OpenIntro Statistics Chapters 8–9 and associated R resources will be used selectively for additional examples, data analysis, graphical diagnostics, and R practice. Instructor notes will supplement topics such as variance inflation factors, multicollinearity, modern model-comparison criteria, and reproducible regression workflow.

Lecture notes, data sets, assignments, announcements, and other course materials may be posted in myLeo Online (D2L Brightspace). Students are responsible for checking the course site and university email regularly.

Prerequisite

MATH 2414 (Calculus II) with a grade of C or higher. Students should be comfortable with algebra and basic differential and integral calculus. Prior coursework in statistics, matrix algebra, or R is not required by the stated prerequisite; necessary statistical concepts, notation, and R skills will be introduced or reviewed as needed.

Course Description

A calculus-based course in statistical regression models with an application in R. Topics covered include introduction to statistical models, simple linear regression, multiple linear regression, parameter estimation, inference in linear regression models, regression diagnostics, model selection, and multicollinearity.

Student Learning Outcomes

By the end of the course, students should be able to:

1. formulate and interpret statistical regression models and distinguish deterministic relationships from stochastic models;
2. fit simple and multiple linear regression models using least squares and explain the mathematical basis of the estimators;
3. estimate model parameters and interpret regression coefficients, fitted values, residuals, and measures of model fit;
4. perform and interpret confidence intervals, hypothesis tests, and prediction procedures in linear regression models;
5. fit and interpret models containing quantitative predictors, indicator variables, interaction terms, and selected polynomial terms;
6. assess regression assumptions using residual plots and other diagnostic tools and identify unusual or influential observations;
7. recognize multicollinearity, explain its effects on estimation and inference, and use diagnostic measures such as variance inflation factors;
8. compare candidate regression models using appropriate statistical criteria and model-selection procedures;
9. use R to fit, diagnose, compare, visualize, and interpret regression models using real data; and
10. communicate modeling results clearly in mathematical, graphical, and written form while distinguishing association, prediction, and causation.

Course Requirements

Minimal Technical Skills Needed

Students should be able to:

- use university email and myLeo Online (D2L Brightspace) to read announcements, download materials, and upload assignments;
- use an updated web browser and manage files and folders on a computer;
- create, save, and submit common document formats such as PDF files;
- install or access R/RStudio, open and save scripts, run commands, and locate saved output; and
- maintain backup copies of course files and R scripts.

Prior programming experience is not required. The R skills needed for the course will be developed through demonstrations and guided practice.

Instructional Methods

This face-to-face course will use a combination of lecture, mathematical derivation, worked examples, guided problem solving, discussion, R demonstrations, data-analysis activities, homework, R labs, examinations, and a statistical modeling project. Course materials and announcements will be supported through myLeo Online (D2L Brightspace).

Student Responsibilities and Tips for Success

Students are expected to:

- attend class regularly and arrive prepared to participate in mathematical and data-analysis activities;
- review prerequisite algebra and calculus promptly if the first-day diagnostic identifies a weakness;
- check university email and myLeo Online (D2L Brightspace) regularly, preferably daily on class days;
- begin homework, R labs, and project work early enough to ask questions before deadlines;
- keep organized, backed-up copies of R scripts, data files, and submitted work;
- ask for clarification when an instruction, collaboration rule, or permitted technology use is unclear; and
- use office hours and university academic-support resources before difficulties become severe.

Calculator / Technology

A regular scientific calculator is recommended for examinations and quizzes. Unless explicitly authorized by the instructor, phones, tablets, smart watches, computer algebra systems, generative AI tools, messaging applications, and other communication-enabled devices may not be used during examinations. R/RStudio will be used for designated labs, homework, demonstrations, and the modeling project; use of software on an examination will be announced in advance if applicable.

Course Software or Statistical Package

The statistical software R will be used throughout the course for fitting, diagnosing, comparing, and interpreting regression models. Download R from the [R Project](#). Students may use RStudio as an interface for R.

Students will be expected to read data into R, create appropriate graphical summaries, fit linear models with functions such as `lm()`, interpret model summaries, obtain confidence and prediction intervals, produce diagnostic plots, and compare competing models. Necessary R syntax will be introduced in class and in posted examples.

Grading

The following weights show how the final course grade is calculated.

Assessment	Weight	Tentative Timing
Midterm Exam I	20%	Tuesday, October 6, 2026
Midterm Exam II	20%	Tuesday, November 17, 2026
Homework	10%	Approximately 6–8 assignments / as announced
R Labs	15%	Approximately 6–8 labs / as announced
Statistical Modeling Project	10%	Due Thursday, December 3, 2026
Comprehensive Final Exam	25%	Thursday, December 10, 2026, 10:30 AM–12:30 PM
Total	100%	

Assessment Details

First-Day Diagnostic Assessment: The first class meeting includes an ungraded prerequisite diagnostic assessment and student-background survey. It does **not** count toward the course grade. Its purpose is to identify algebra/calculus skills that may need review and to help the instructor adjust early-course support.

Midterm Exam I: Emphasizes introduction to statistical models and simple linear regression, including least-squares estimation, parameter interpretation, inference, prediction, and regression diagnostics. It is planned for **Tuesday, October 6, 2026**.

Midterm Exam II: Emphasizes multiple linear regression, parameter estimation and inference, indicator and interaction terms, regression diagnostics, and multicollinearity. It is planned for **Tuesday, November 17, 2026**.

Homework: Homework develops the mathematical theory and hand calculations underlying regression methods and reinforces interpretation of statistical results.

R Labs: R labs emphasize practical data analysis, model fitting, visualization, diagnostics, reproducibility, and interpretation. Students should retain their code and output because later labs may build on earlier skills.

Statistical Modeling Project: Students will analyze an approved data set using a regression-modeling workflow. The project will include a clearly stated modeling question, exploratory analysis, model fitting, diagnostic assessment, comparison or refinement of candidate models, and a concise interpretation of findings supported by reproducible R work. Detailed instructions and the required submission format will be provided separately.

Final Exam: The comprehensive final examination is scheduled for **Thursday, December 10, 2026**,

10:30 AM–12:30 PM. It will assess the major ideas of the course, with particular emphasis on integrating model formulation, estimation, inference, diagnostics, model selection, and interpretation.

Letter Grades

Final course percentages correspond to letter grades as follows:

- **A:** 90% or higher;
- **B:** at least 80% but below 90%;
- **C:** at least 70% but below 80%;
- **D:** at least 60% but below 70%;
- **F:** below 60%.

Attendance and Class Performance

Regular attendance and active participation are expected. Course activities may include mathematical derivations, interpretation exercises, R demonstrations, small-group discussion, or other work supporting the learning objectives. University attendance rules and excused-absence requirements apply. See the [East Texas A&M University attendance information](#).

Late Work and Make-Ups

Unless an individual assignment states otherwise, homework, R labs, and the modeling project are due at the time posted in myLeo Online (D2L Brightspace). Late work is not ordinarily accepted. Exceptions and make-up examinations are provided when required by university policy or when approved by the instructor based on documented circumstances. Students should contact the instructor as soon as reasonably possible when an absence or emergency affects graded work. A missed assessment should never be treated as automatically excused simply because a message was sent after the deadline.

Academic Integrity and Course Conduct

East Texas A&M University students are expected to maintain high standards of integrity and honesty in all scholastic work. For more details and the definition of academic dishonesty, see the University's undergraduate academic-dishonesty procedure and Academic Integrity Guide.

Plain-Language Academic Integrity Rule

Cheating: simply, do not do it.

Unless the instructor explicitly states otherwise, examinations are individual work and are closed to unauthorized notes, websites, messaging, AI tools, solution services, other people, and communication-enabled devices. Do not give or receive unauthorized assistance.

If a student is found responsible for cheating on an examination under East Texas A&M University's undergraduate academic-dishonesty procedure, the instructor's course-level sanction will be a grade of zero (0 points) on that examination, subject to the University's required process and the student's appeal rights. The incident will also be reported and handled as required by University Procedure 13.99.99.R0.03. University officials may impose other sanctions when applicable.

East Texas A&M University expects undergraduate students to maintain high standards of integrity and honesty in all scholastic work. Academic dishonesty includes, but is not limited to, cheating, complicity, fabrication, falsification, forgery, unauthorized multiple submissions, plagiarism, unauthorized access, and unauthorized or undocumented AI use. See the [Academic Integrity Guide](#) and [University Procedure 13.99.99.R0.03: Undergraduate Academic Dishonesty](#).

Collaboration and Sharing Work

Unless an assignment explicitly permits collaboration, graded work must be completed individually. Students may study together and discuss general course concepts, but they may not copy, share, post, transmit, or obtain completed solutions, R code, exam content, or project text for submission as their own work. If collaboration is authorized, the assignment instructions will state what collaboration is permitted and what each student must submit independently.

Artificial Intelligence (AI) Use

East Texas A&M University acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

Course-specific AI rule. Generative AI tools may be used only for general study support unless a particular assignment explicitly authorizes additional use. Examples of study support include requesting an alternative explanation of a concept or asking for additional ungraded practice questions. Students should keep a brief record of any AI use associated with the course. Unless an assignment explicitly states otherwise, AI tools may **not** be used to generate or revise solutions, derivations, R code, statistical interpretations, reports, project text, or other work submitted for credit. Any AI use that is authorized for graded work must be documented as directed by the instructor. Undocumented or unauthorized AI use on graded work will be handled as academic dishonesty under university policy. Students remain fully responsible for the correctness, reproducibility, citation, and originality of all submitted work.

Technology Requirements, Access, and Support

Learning Management System (LMS) – D2L

All East Texas A&M University course sections have a corresponding course shell in myLeo Online (D2L Brightspace). Students will use the LMS to access course materials, announcements, selected assignments, and grades. For current platform and browser guidance, see the [myLeo Online \(D2L\) Guide](#), the [Brightspace Platform Requirements](#), and the [Brightspace Browser Support information](#).

Access and Navigation

Students need their campus-wide ID (CWID) and password to access university systems. Students who do not know their CWID or who have password/access difficulties should contact the Center for IT Excellence

(CITE) at **903-468-6000** or helpdesk@etamu.edu.

Personal computer or internet problems do not automatically excuse missed coursework. Students should maintain a reasonable backup plan, such as access to a campus computer lab, library computer, another reliable device, or another internet connection when feasible. Contact the instructor promptly if a significant technical problem affects a timed assessment or deadline.

Technical Support

For Brightspace/D2L technical difficulty, use the support options available through the [myLeo Online \(D2L\) Guide](#). Brightspace support may also be reached at **1-877-325-7778**. For myLeo/CWID access issues, contact CITE at **903-468-6000** or helpdesk@etamu.edu.

Communication and Support

Interaction with the Instructor

Course correspondence will use university email and announcements in myLeo Online (D2L Brightspace). Students should check their East Texas A&M University email regularly; D2L announcements do not replace the need to monitor university email.

When emailing the instructor, please include:

- the course code and topic in the subject line;
- an appropriate greeting;
- a clear question or explanation written with professional grammar and punctuation; and
- your full name and CWID when the CWID is necessary to resolve a student-specific administrative issue.

If you have questions or are having difficulty with course material, contact the instructor early and use office hours whenever possible.

Fall 2026 Academic Calendar Notes

The Fall 2026 term begins on Thursday, August 20, 2026, so the first meeting of this Tuesday/Thursday section is **Thursday, August 20**. Fall Break is **Thursday, October 8** (no class). Student Thanksgiving Break begins Wednesday, November 25, so there is **no class Thursday, November 26**. The last regular meeting of this section is **Thursday, December 3**. Fall final examinations begin Saturday, December 5. The official final examination for a Tuesday/Thursday class meeting at 12:30 PM is **Thursday, December 10, 2026, 10:30 AM–12:30 PM**.

Tentative Course Outline / Calendar

The schedule below is designed around the catalog-required MATH 341 topics, regular use of R, two midterm examinations, university breaks, and the official final examination. The first meeting is reserved primarily for course orientation and an ungraded prerequisite diagnostic so that early review can be adjusted to student needs. Minor adjustments may be made based on class progress. Substantive changes will be announced in advance through class communication and/or myLeo Online (D2L Brightspace).

Week	Dates	Topics / Activities	Primary Reading
1	Aug. 20	Course introduction and syllabus; student background survey; ungraded prerequisite diagnostic assessment . Brief preview of statistical modeling and R/RStudio if time permits.	Instructor notes
2	Aug. 25, 27	Introduction to statistical models; response and predictor variables; deterministic versus stochastic relationships; modeling workflow; R/RStudio orientation; scatterplots; simple linear regression model and assumptions.	M&A Ch. 11; OI 8.1–8.2
3	Sept. 1, 3	Least-squares criterion and parameter estimation; calculus derivation of the normal equations in simple regression; fitted values and residuals; SSE, MSE, error variance, decomposition of variability, and R^2 ; fitting models in R.	M&A Ch. 11
4	Sept. 8, 10	Sampling properties of least-squares estimators; standard errors; confidence intervals and hypothesis tests for slope and intercept; overall significance of simple linear regression; interpretation of R output.	M&A Ch. 11; OI 8.4
5	Sept. 15, 17	Estimation of mean response; prediction of a new observation; confidence versus prediction intervals; correlation and coefficient of determination; practical interpretation.	M&A Ch. 11; OI supplement
6	Sept. 22, 24	Regression diagnostics I: residuals and residual plots; checking linearity, constant variance, normality, and independence; consequences of violations; introductory transformations.	M&A Ch. 11; OI 8.3
7	Sept. 29; Oct. 1	Regression diagnostics II: outliers, leverage, influence, studentized residuals, Cook's distance, R diagnostic plots, synthesis, and Midterm I review.	M&A Ch. 11; instructor notes
8	Oct. 6, 8	Oct. 6: Midterm Exam I. Oct. 8: Fall Break – no class.	Ch. 11 review
Week	Dates	Topics / Activities	Primary Reading
9	Oct. 13, 15	Multiple linear regression model; interpretation of partial regression coefficients; introduction to matrix notation; least-squares estimation and normal equations; fitting multiple regression models in R.	M&A Ch. 12; OI 9.1
10	Oct. 20, 22	Properties of multiple-regression estimators; estimated variance-covariance structure; inference for individual coefficients; overall F test; testing subsets of predictors.	M&A Ch. 12
11	Oct. 27, 29	Confidence intervals and prediction in multiple regression; indicator variables; interaction terms; selected polynomial models; interpreting adjusted effects.	M&A Ch. 12; OI supplement
12	Nov. 3, 5	Multiple-regression diagnostics: residual analysis, leverage, influence, influential observations, graphical condition checking, and R diagnostic workflow.	M&A Ch. 12; OI 9.3
13	Nov. 10, 12	Multicollinearity: sources and consequences; correlated predictors; variance inflation factors; instability of coefficient estimates; practical remedies; Midterm II review.	Instructor notes; M&A Ch. 12
14	Nov. 17, 19	Nov. 17: Midterm Exam II. Nov. 19: introduction to model selection; competing goals of explanation and prediction; adjusted R^2 , Mallows' C_p , PRESS, and information criteria.	M&A Ch. 12; OI 9.2
15	Nov. 24, 26	Nov. 24: forward selection, backward elimination, stepwise procedures, validation ideas, and dangers of automatic model selection. Nov. 26: Thanksgiving Break – no class.	M&A Ch. 12; instructor notes
16	Dec. 1, 3	Model refinement and transformations; comparing candidate models; reproducible R workflow; modeling-project synthesis/presentations as appropriate; comprehensive review.	Selected review
Final	Dec. 10	Modeling Project due Dec. 3. Comprehensive Final Exam, 10:30 AM–12:30 PM.	Comprehensive

Note: The two midterm dates and project due date are planned course dates and may be adjusted with advance notice if necessary. The final-exam date and time are determined by the official East Texas A&M University Fall 2026 final-exam schedule for Tuesday/Thursday classes meeting at 12:30 PM.

Course and University Procedures / Policies

Syllabus Change Policy

This syllabus is a guide. Circumstances and events, including student progress or university changes, may make it necessary to modify the syllabus during the semester. Any substantive changes will be announced in advance through class communication, university email, and/or myLeo Online (D2L Brightspace).

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Code of Conduct](#). Students should also follow applicable rules of netiquette when interacting through university systems.

Reproducible R Work

For graded R assignments, students should submit the requested code, output, figures, and interpretation in the required format. Code should run from a clean session using the stated data and packages unless the instructor specifies otherwise. Students are responsible for maintaining backup copies of their files.

Students with Disabilities– ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
East Texas A&M University
Velma K. Waters Library Rm 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@etamu.edu
Website: [Office of Student Disability Services](#)

Nondiscrimination Notice

East Texas A&M University will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information, or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in East Texas A&M University buildings only by persons who have been issued and are in possession of a

Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so.

Pursuant to Penal Code (PC) 46.035 and ETAMU Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus document](#) and/or consult your event organizer.

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all East Texas A&M University campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

East Texas A&M Supports Students' Mental Health – Counseling Services

The Counseling Center at East Texas A&M University, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit the [Counseling Center website](#).

Mental Health and Well-Being

The university aims to provide students with essential knowledge and tools to understand and support mental health. As part of our commitment to your well-being, we offer access to TELUS Health, a service available 24/7/365 via chat, phone, or webinar. Students should use the current university-provided TELUS Health access information in myLeo or on the university website to obtain the app and available resources.

Tutoring, Library, and Writing Support

Students are encouraged to use university academic-success resources, including tutoring, the Velma K. Waters Library, and the Writing Center. The Writing Center can also assist with clear communication of statistical results. See the [Writing Center](#) and the university website for current tutoring and library services.

Copyright and Course Materials

Course materials are provided for students enrolled in this course. Unless otherwise stated, instructor-created course materials may not be redistributed, posted publicly, sold, or shared outside the course without permission and in accordance with applicable copyright law and university policy. This restriction does not limit a student's lawful use of materials for accessibility accommodations or other uses protected by law.