Office of Academic Affairs
Tarleton State University

Master Course Syllabus Outline

Department: Mathematics, Physics, and Engineering
Course Prefix/Number: Math 232-3
Official Course title: Applied Matrix Algebra
Master Syllabus Approved by Department on: ___1___/__23__/__2008__
month date year

I. Catalog Description: An introduction to matrix and vector arithmetic, Gaussian Elimination, matrix factorization, determinant, matrix inverse, eigenvalues and eigenvectors. Applications to be chosen from linear models, linear optimization and the Simplex Method, orthogonal projections and least-square problems, matrix Diagonalization, discrete dynamical systems cryptology and computer graphics. Technology will be emphasized.

II. Prerequisite: MATH 2413.

III. Expanded Course Description: Solving systems of linear equations using matrices are introduced and the supporting theory developed. Existence of the echelon form of a matrix and invertability of matrices is discussed. Determinants, their properties, and connections to the inverse of a matrix are made. Eigenvalues, eigenvectors and similar matrices are introduced to the students. Computer software (Matlab and/or Maple) and calculator technology will be used to facilitate the solutions of applications that will be chosen from:

a. Linear systems and models
b. Curve fitting
c. Cryptology
d. Computer graphics
e. Discrete Dynamical Systems
f. Linear optimization and Simplex Method
g. Orthogonal Projections and Least Square Solutions

IV. Intended Student Outcomes: Students will

a. demonstrate proficiency in algebra of matrices.
b. demonstrate ability to convert matrices into echelon and factored forms.
c. be able to compute determinants and interpret the result with respect to relevant applications.
d. be able to calculate eigenvalues and eigenvectors and apply results to applications.
e. demonstrate proficiency with computer technology as related to matrix manipulation and applications.

V. Unless otherwise stipulated in this master syllabus by the department, the following items are subject to faculty discretion as described in each faculty member's individual course outline/syllabus:

a. Course Requirements
b. Required Text(s)
c. Bibliography

MATH 2323 – Applied Matrix Algebra
Spring 2018

Instructor: Dr. Peter W. White
Office: Math 331
Phone #: 968-1982
e-mail: white@tarleton.edu
Math Office #: 968-9168
Office Hours: MTWRF 10-10:50 am, or by appointment.

University Policy: Students are responsible for knowing and abiding by the policies and information contained in the Tarleton Student Handbook.

Student Responsibilities: The student is *solely* responsible for:

- Completing each assignment by the specified due date.
- Obtaining assignments and other materials for classes from which they are absent.
- Utilizing, as needed, all available study-aid options (including meeting with the instructor, attending the Supplemental Instruction (SI) sessions, going to the Mathematics Clinic, using tutorial software, purchasing a student solutions manual, hiring a personal tutor, etc.) to resolve any questions that they might have regarding homework, course material, and/or technology projects.
- Giving as much of an effort as it takes to pass this course.

Academic Conduct: Students guilty of academic dishonesty, cheating, or plagiarism in academic work shall be subject to disciplinary action. The instructor may initiate disciplinary action in any case of academic misconduct.

Services for Students with Disabilities: Students with documented disabilities may request reasonable accommodations that will enable them to participate in and benefit from all educational programs and activities. If you are a student with a documented disability and wish to request accommodations for this course, please contact Trina Geye, Director of Student Disability Services, at geye@tarleton.edu or 254.968.9400.

Absence Policy: Class absence policies will be established and enforced by each individual course instructor. The course instructor may recommend to the Dean of Students that a student be dropped from a course if excessive absences prevent satisfactory progress.

Makeup Policy: Each course instructor has the responsibility and authority to determine if work can be made-up because of absences. Students may request make-up considerations for valid and verifiable reasons such as the following:

- Illness
- Death in the immediate family
- Legal proceedings
- Participation in sponsored University activities (It is the responsibility of students who participate in University-sponsored activities to obtain a written explanation for their absence from the faculty/staff member who is responsible for the activity.)

Drop Policy: A student who withdraws from a course before the thirteenth class day of a regular semester or before the fifth class day in a summer term receives no grade, and the course will not be listed on that student's permanent record. A student who withdraws from a course before the end of the tenth week of a regular semester or the fourteenth class day of a summer term receives a grade of W.

Calculator Policy: All students are required to have an approved graphing calculator when taking this course. During the administration of a test, the use of calculators may be restricted, at the discretion of the instructor. Students may also be restricted to the use of a calculator that does not have course notes stored in the memory. The instructor reserves the right to examine and delete material from the memory of a student's calculator before approving its use on an exam.

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Text: Visual Linear Algebra with Maple and Mathematica Tutorials by Herman & Pepe ISBN 0-471-68299-3.

Homework Policy: Assignments will be made at the end of each section covered. Each assignment will be do and collected at the beginning of second lecture period after the assignment was given. Each assignment will be spot graded. Each assignment will be equally weighted when calculating the Home Work grade. The instructor reserves the ability to drop some low scores before calculating the Home Work grade.

Quizzes: Quizzes may be given instead of collecting the section of home work for a given day. The quiz score will take the place of the home work score for that day. Quizzes will be at the beginning of the class period and can not be made up except in the case of a verifiable university recognized absence.

Technology Projects: Computer labs will be assigned and collected as the instructor deems necessary.

Exams: There will be four 50 minute exams during the semester and a comprehensive final exam TBA in the regularly scheduled room. The final exam will be weighted to count as two of the 50 minute exams.

Calculator Policy: An approved graphing calculator is required for this course. It is recommended that the students use a TI-83, 83+, 86, 89 or TI-Enspire calculator.

Attendance Policy: Attendance will not normally be taken. The student is responsible for all material covered in class. The student may not be allowed to turn in late work or make up exams or quizzes unless they have a verifiable university recognized absence.

Grading Policy:

Homework/Quizzes/Labs	200 pts	720-800 pts	A
Four exams	400 pts	640-719 pts	B
Final exam	200 pts	520-639 pts	C
		400-519 pts	D
		0-399 pts	F
Total	800 pts		

Course Content:
I. Linear systems and models
II. Curve fitting
III. Cryptology
IV. Computer Graphics
V. Discrete Dynamical Systems
VI. Eigenvalues, Eigenvectors
VII. Applications of Eigenvalues and Eigenvectors
VIII. Linear optimization and Simplex Method
IX. Orthogonal Projections and Least Square Solutions

Notes:
- In the event that the university is closed for a scheduled class time, whatever was scheduled for that day and/or whatever was due that day will be scheduled and/or due on the next scheduled class time.
- You are expected to present a TSU ID upon request.
- **All items contained in this syllabus are subject to change as the semester progresses. Students will be notified in advance of any changes.**