# MATH 572 01W: MODERN APPLICATIONS OF MATHEMATICS
## Summer I 2016

CONTACT INFORMATION:

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| Office Hours | : TR 2:30-3:30p, otherwise by appt. |

DESCRIPTION and POLICIES:

1. Class Schedule: Online (Section 01W)
   **Office hours** will be held online at times indicated above at the Adobe Connect website: http://connect.tamuc.edu/coskun. Students will have access to this discussion room as a **guest** without an account. Students are encouraged to take advantage of the office hours for all questions.

2. Textbook: **No textbook** is required. Instructor's lecture notes and software modules will be used for the course. **Two lecture outlines** will be posted every week on Mondays and Thursdays in DocSharing folder, covering an overview of the lectures, the outcomes, the activities, the assignments, and all deadlines.

3. Website & Internet: An **eCollege website** has been created for the course which may be accessed from student myLEO accounts following the eCollege and then **My Courses** tabs. All files and documents, lecture notes and outlines, links to video content, and software modules that the instructor shares with the class will be posted in the Doc Sharing folder in the course website. All material posted or shared at the course website is **copyrighted** ©. You are allowed to retain one copy of each file for your personal use, but the files should not be distributed in any form without instructor's written consent.

4. Course Description: This course, specifically designed for teachers, covers a range of applications of mathematics. Specific **topics will vary**, but may include classical (private key) encryption, data compression ideas, coding theory ideas (Hamming 7,4 code), private and public key cryptography, data compression including wavelets, difference equations (populations models, disease models) and stochastic difference equations (stocks), GPS systems, computer tomography (e.g. CAT scans), polynomial interpolation/Belier curves, etc., and other topics from student presentations. **Prerequisites:** Consent of Instructor.

5. SMALL CAPS Learning Outcomes: Students who complete this course successfully will
   a) learn the *terminology* of certain modern applications of mathematics;
   b) learn the *methods* employed in the selected applications;
   c) learn the *applications* of theoretical methods to practical problems.

6. Software: *Mathematica* software is **required** for the course. It will be used for carrying out computations in discussion sessions, homework exercises, exams and projects. Mathematica 10 may be installed in Mathematics computer lab in BIN 328, and in computer labs at the Metroplex center. **Personal student licenses** can be purchased online at the Wolfram Mathematica website `http://www.wolfram.com/mathematica/how-to-buy/education/`. Mathematica has recently introduced an **online version**. In principle, it should be the same with the desktop version, but the user interface looks different. You may use it at your own risk. We will be using the desktop version for all classroom presentations, and other activities.

7. Homework: Progress reports on projects are due **twice every week** for homework, and will be worked in Mathematica, and turned in **electronically** to the Dropboxes for that week at the eCollege website. You may work in groups unless otherwise instructed, however the file you turn in must be your own work. **Late homework** is not accepted. Homework score will make **50 points** of the final grade.

8. Tentative Course Outline:

   1. Introduction to **Mathematica** (Week 1)

   2. **Descriptive statistics** with Mathematica (Week 1 & 2)

   3. Designing public key **cryptosystems** (Week 3 & 4)

   4. **Signal** (sound and image) processing (Week 4 & 5)

9. Tests & Projects: There will be **three projects** for the applications covered in class. All projects will be worked in **Mathematica**, and turned in electronically as a Mathematica notebook into the corresponding Dropboxes by the deadlines indicated in the **lecture outlines**. Late work is not accepted.

10. Tentative Exam/Project Schedule:

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| Descriptive Statistics project | 140 pts | Thursday June 16, 2016 |
| Cryptography project | 130 pts | Monday June 27, 2016 |
| Signal Processing project | 130 pts | Thursday July 7, 2016 |

11. GRADING SCALE: All scores will be added and a **letter grade** will be assigned according to the following table.

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|---|---|
| A | 406 - 450 pts |
| B | 361 - 405 pts |
| C | 316 - 360 pts |
| D | 271 - 315 pts |
| F | 0 - 270 pts |

12. MISCELLANEOUS: Your enrollment in this course indicates that **you agree to observe** all the conditions and regulations of this syllabus and the Student Handbook. The test and homework scores may be filed to be used anonymously for educational research.

It is the **student's responsibility** to secure the software licenses and other resources (such as a personal computer with proper operating system to run the software, broadband internet access to view the video recordings and participate in online discussion sessions, etc.) to be able to complete and communicate all assignments, tests and projects to the instructor as required. The access information to Library resources, and Help Desk for technical support are available through the eCollege website.

Policies pertaining to scholastic dishonesty are identical to TAMU-Commerce regulations given in the **Student Handbook**, available online at the website `http://web.tamuc.edu/studentLife/documents/studentGuidebook.pdf`. All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment (See Student's Guide Handbook, Policies and Procedures, Conduct). Disruptive behavior and scholastic dishonesty in any form will not be tolerated.

Students requesting **accommodations** for a disability should contact the Office of Student Disability Resources and Services, Texas A&M University-Commerce, Gee Library, Room 132, Phone: (903) 886-5150 or (903) 886-5835, Fax: (903) 468-8148, or Email: `StudentDisabilityServices@tamuc.edu`.

Mathematica software offers various **accessibility** features. Please visit Accessibility statement in the Documentation Center of the software for a full listing of these features.

Any **possible changes** to be made in this syllabus by the instructor during the semester will be announced by email.