Elementary Cryptology

MATH 3347.90L (CRN 62746)

Syllabus

Semester: Summer I 2019
Classes: No fixed class times
Instructor: Professor Dr. Paul-Hermann Zieschang
Phone: 956-665-7063
Email: paulhermann.zieschang@utrgv.edu
Office Hours: On request

Textbook: A textbook will not be required, instead a pdf-file will be distributed containing all necessary material.

Course Description and Prerequisites: Topics include elementary ciphers, public key ciphers, and error-correcting codes. Prerequisites: MATH 2318 with a grade of ‘C’ or better.

Course Learning Outcomes: Students completing MATH 3347 will be able to use concepts from number theory, group theory, and ring theory to encode and decode messages using various elementary ciphers such as affine ciphers, polyalphabetic ciphers, the Vigenère cipher, the Hill cipher, substitution ciphers, permutation ciphers, the Playfair cipher, the ADFGX cipher, and the enigma cipher; be able to use concepts from number theory and group theory to encode and decode messages using public-key ciphers such as the Knapsack cipher, the RSA cipher, and the ElGamal cipher; be able to use concepts from linear algebra, group theory, and finite field theory to detect and correct transmission errors using error-correcting codes such as Hamming codes, and BCH codes.

Program Learning Outcomes: Students completing the Bachelor of Science in Mathematics will demonstrate in-depth knowledge of mathematics, its scope, application, history, problems, methods, and usefulness to mankind both as a science and as an intellectual discipline; demonstrate a sound conceptual understanding of mathematics through the construction of mathematically rigorous and logically correct proofs; identify, formulate, and analyze real world problems with statistical or mathematical techniques; utilize technology as an effective tool in investigating, understanding, and applying mathematics; communicate mathematics effectively.
Grading Policies: UTRGVs grading policy is to use straight letter grades (A, B, C, D, or F). Homework: 40%, midterm(s): 40%, final examination: 20%. Late work will be not considered.

UTRGV Policy Statements: The UTRGV disability accommodation, mandatory course evaluation statement and sexual harassment statement are required on all syllabi. Additional policy statements are optional, such as those covering attendance, academic integrity, and course drop policies.

STUDENTS WITH DISABILITIES: Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact Student Accessibility Services (SAS) as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS at any time, but are not retroactive. Students who suffer a broken bone, severe injury or undergo surgery during the semester are eligible for temporary services. Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at ability@utrgv.edu. Edinburg Campus: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at ability@utrgv.edu.

MANDATORY COURSE EVALUATION PERIOD: Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available between July 1 and July 10.

ATTENDANCE: Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGVs attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

SCHOLASTIC INTEGRITY: As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism (including self-plagiarism), and collusion; submission for credit of any work or materials that are attributable in
whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE: In accordance with UT System regulations, your instructor is a Responsible Employee for reporting purposes under Title IX regulations and so must report any instance, occurring during a students time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct and discrimination.

COURSE DROPS: According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the 3-peat rule and the 6-drop rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

STUDENT SERVICES: Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Students Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions. Students seeking academic help in their studies can use university resources in addition to instructors office hours. University Resources include the Learning Center, Writing Center, Advising Center and Career Center. The centers provide services such as tutoring, writing help, critical thinking, study skills, degree planning, and student employment. Locations are: (i) Learning center: BSTUN 2.10 (Brownsville) or
ELCTR 100 (Edinburg) (ii) Writing center: BLIBR 3.206 (Brownsville) or ESTAC 3.119 (Edinburg) (iii) Advising center: BMAIN 1.400 (Brownsville) or ESWKH 101 (Edinburg) (iv) Career center: BCRTZ 129 (Brownsville) or ESSBL 2.101 (Edinburg)