MAT 333 Abstract Algebra, Section 01, CN 43929 Fall 2024

Class meets MW 10:00 AM - 11:15 AM in SBS B203.

Instructor: Serban Raianu, office: NSM E-108, office phone: (310) 243-3139, cell phone: (657) 204-5612;
e-mail address: sraianu@csudh.edu, URL: http://math.csudh.edu/~sraianu;
office hours: Monday, Wednesday, Friday: 2:30 PM – 3:50 PM, or by appointment.

Course Description: MAT 333, Abstract Algebra, covers material from the first two chapters of the textbook: sets, groups, rings, polynomial rings, fields.

**Text: Algebra I: Groups, Rings, & Arithmetic, by Serban Raianu, PDF available online
at https://math.csudh.edu/~sraianu/algebrabook.html**

Objectives: After completing MAT 333 the student should be able to: state definitions of basic concepts (e.g., congruence, groups, rings, integral domains, fields, subrings, homomorphisms, ideals); understand and use the Euclidean algorithm; understand and use modular arithmetic; state major theorems (e.g., the division algorithm, the unique factorization theorem, the remainder theorem, the factor theorem, the isomorphism theorems) and be able to identify the structures to which each theorem applies (e.g. the integers, integral domains, polynomial rings F[x] where F is a field, groups, etc.) ; find examples of objects that satisfy given algebraic properties (a noncommutative ring, a commutative ring but not an integral domain, etc.)

Prerequisites: MAT 271 or equivalent with a grade of "C" or better.

Grades: Grades will be based on **three full period written examinations** (60% total), a comprehensive **final examination** (25%), and **quizzes**, **homework** and (possibly) other assignments (15%) for the remainder.
The exact grading system for your section is the following:

No makeup examinations will be given. The exams are taken in class and graded on Gradescope. If you must miss an examination for a legitimate reason, discuss this, in advance, with me, and I may then substitute the relevant score from your final examination for the missing grade. Each of the **three exams** will be graded on a 0-20 scale, then the sum of the scores is denoted by E.

Homework will be due in principle every week, the day before quiz days, and each homework is worth 10 points. Each week one of the problems from the homework due for that week will be selected and graded on a scale from 0 to 4. The remaining 6 points will be awarded for completeness of the homework assignment. Submitting solutions copied from the back of the book will bring little or no credit, since copying solutions will not prepare you for answering questions on exams. The average of all homework scores is denoted by H. Homework will be submitted as a pdf on Gradescope. There is no need to match the pages with the problems when submitting the homework, see
https://www.youtube.com/watch?v=u-pK4GzpId0
Gradescope can be accessed from the link your Canvas course, and you can practice submitting your work on Gradescope using the assignment called Submission practice, which will remain open throughout the semester. No late homework will be accepted.

15 minutes quizzes will be given in principle every week, and will be graded on a scale from 1 to 5. The average of the quizzes scores is denoted by Q. Each quiz will consist of one problem, similar but not necessarily identical to one of the homework problems assigned for that week. The quiz will be taken in class and graded in class and on Gradescope. No makeup quizzes will be offered.

The **final exam will contain problems similar to problems assigned as homework throughout the semester,** will be graded out of a maximum possible 25 points, then the score is denoted by F. The final exam will be taken in class and graded on Gradescope.

Extra credit opportunities will be announced in class.

To determine your **final grade**, compute E+H+Q+F. The maximum is 100, and the grade will be given by the rule:

A: 93-100; A-: 90-92; B+: 87-89; B: 83-86; B-: 80-82
C+: 77-79; C: 73-76; C-: 70-72; D+: 67-69; D: 60-66; F: Less than 60.

You will be able to follow your progress in the class in Canvas under Grades throughout the semester.

Accommodations for Students with Disabilities: California State University, Dominguez Hills adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with temporary and permanent disabilities. If you have a disability that may adversely affect your work in this class, I encourage you to register with Student disAbility Resource Center (SdRC) and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. Please note: no accommodation may be made until you register with the SdRC in WH D-180. For information call (310) 243-3660 or to use telecommunications Device for the Deaf, call (310) 243-2028.

Academic Integrity: The mathematics department does not tolerate cheating. Students who have questions or concerns about academic integrity should ask their professors or the counselors in the Student Development Office, or refer to the University Catalog for more information. (Look in the index under "academic integrity".)

Tentative schedule and homework assignments

M 8/26:   1**.**1 Sets and functions: 1.1.2,1.1.6,1.1.7,1.1.8,1.1.11,1.1.12
W 8/28:   1.1 Sets and functions: 1.1.13,1.1.15,1.1.16,1.1.17
M 9/2:   **Labor Day**
W 9/4:   1.2 The integers: 1.2.3,1.2.4,1.2.6,1.2.9,1.2.12
M 9/9:   1.2 The integers: 1.2.14,1.2.16,1.2.17,1.2.18,1.2.26
W 9/11:   1.3 Equivalence relations and factor sets: 1.3.3, 1.3.5
M 9/16:   1.3 Equivalence relations and factor sets: 1.3.9,1.3.12, 1.3.19
W 9/18:   1.4 Groups and morphisms of groups: 1.4.3,1.4.4,1.4.5
M 9/23:   1.4 Groups and morphisms of groups 1.4.6,1.4.7,1.4.8,1.4.11,1.4.13
W 9/25:   **Review**
M 9/30:   **Exam 1**
W 10/2:   1.5 Subgroups and normal subgroups: 1.5.3,1.5.4,1.5.6,1.5.8
M 10/7:   1.5 Subgroups and normal subgroups: 1.5.13,1.5.15
W 10/9:   1.6 Factor groups: 1.6.2,1.6.4
M 10/14:   1.6 Factor groups: 1.6.16,1.6.17
W 10/16:   1.7 Finite groups and the Lagrange theorem:1.7.3,1.7.7,1.7.8,1.7.10,1.7.11
M 10/21:   1.7 Finite groups and the Lagrange theorem: 1.7.14,1.7.19,1.7.20,1.7.21
W 10/23:   2.1 Rings and morphisms of rings: 2.1.2, 2.1.4,2.1.6,2.1.7,2.1.8, 2.1.13
M 10/28:   **Review**
W 10/30:   **Exam 2**
M 11/4:   2.2 Subrings and ideals: 2.2.2,2.2.3,2.2.5,2.2.6
W 11/6:   2.2 Subrings and ideals: 2.2.7,2.2.8,2.2.10,2.2.12
M 11/11:   **Veterans Day**
W 11/13:   2.3 Factor rings: 2.3.4,2.3.6,2.3.8,2.3.10,2.3.16
M 11/18:   2.4 Prime and maximal ideals: 2.4.2,2.4.3,2.4.5,2.4.10,2.4.12,2.4.15
W 11/20:   2.6 Polynomial rings: 2.6.3,2.6.6,2.6.7
M 11/25:   2.6 Polynomial rings: 2.6.9,2.6.10
W 11/27:   2.6 Polynomial rings: 2.6.11,2.6.12
M 12/2:   **Review**
W 12/4:   **Exam 3**
M 12/9:   **Final review**

Final examination: Monday, December 16, 10:00 AM - 12:00 PM.

Important Dates:

August 26 Monday Classes Begin
August 26-September 13, Monday-Friday Late Registration and Add/Drop via MyCSUDH – fees due 48 hours after registration
September 2, Monday, Labor Day Holiday – NO CLASSES, CAMPUS CLOSED
September 6, Friday, Instructor Drop Deadline
September 4-19, Wednesday-Thursday, Late Registration and Add/Drop via MyCSUDH – fees due at time of registration
September 15, Sunday, Fall 2024 Graduation Application Deadline – with late fee
September 19, Thursday, Credit/No Credit and Audit Grading Deadline
September 20, Friday, Last Day to Drop from FT to PT Status with Refund
September 20, Friday, Drop Without Record of Enrollment Deadline via Change of Program Form
September 20, Friday Student Census
September 23-November 15, Monday-Friday, Serious and Compelling Reason Required to Withdraw
October 1 Tuesday Spring 2025 Graduation Application Deadline – without late fee
October 14-January 20, Monday-Monday, Spring 2025 Registration via MyCSUDH
October 17, Thursday, The Great California ShakeOut at 10:17 a.m.
October 22-December 19, Tuesday-Thursday, Winter 2025 Registration – fees due at time of registration
October 31, Thursday, Last Day for Pro-rata Refund of Non-Resident Tuition and Tuition fees
November 1, Friday, First day to file for Summer 2025 Graduation
November 11, Monday, Veterans Day Holiday – NO CLASSES, CAMPUS CLOSED
November 18-December 9, Monday-Monday, Serious Accident/Illness Required to Withdraw
November 28, Thursday, Thanksgiving Day Holiday – NO CLASSES, CAMPUS CLOSED
November 29-December 1, Friday-Sunday, Thanksgiving Break, not a Holiday – NO CLASSES, CAMPUS CLOSED
December 9, Monday, Last Day of Scheduled Classes
December 10-16, Tuesday-Monday, Final Examinations
December 10, Tuesday, Grade Submission Begins
December 14, Saturday, Spring 2025 Graduation Application Deadline – with late fee
December 17, Tuesday, Evaluation Day
December 19, 3 p.m. Thursday, Final Grades Due (College of Continuing and Professional Education
grades always due 72 hours after course end date)
December 19 Thursday Semester Ends