# ***Rochester Institute of Technology Spring 2023-24***
# ***Combinatorics MATH 361 (52564)***

**Instructor:** *Dr. Hossein Shahmohamad* Gosnell 08-2304 (585) 475-7564
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**Class Meetings**: MATH-361-01 Tu Th 8:00 am – 9:15 am (GOS) 08-2365
**Office Hours:** Tu Th 9:15 am – 11:00 am & by appointment & by Zoom

**Texts:** "*Introductory Combinatorics*", 5th Edition, By: Richard Brualdi, 2010

**Course Description and Objectives:**
Combinatorics is concerned with existence, enumeration, analysis, and optimization of discrete structures. Combinatorics is concerned with arrangements of the objects of a set into patterns satisfying specified rules. Two general types of problems occur repeatedly and they are existence of the arrangements and enumeration or classification of the arrangements. Students will be motivated by examples and proofs are given when reasoning is needed to solve applied problems. General reasoning skills are stressed. ***You are expected to think in this course.***

**Outline of Topics:**
Basic techniques, Pigeonhole principle, permutations and combinations, bijective proofs, binomial coefficients, binomial identities, Catalan numbers, partitions, inclusion-exclusion principle, derangements, forbidden positions, ordinary and exponential generating functions, solving recursions

**Remarks:**
Homework assignments are given out every week and are due every Thursday. Be neat, use 8½" x 11" paper, and include your name on each sheet. Write on one side of the paper and staple all pages. Quizzes will be given every Thursday. There will be no make-up exam, quiz or homework assignment. Anyone who needs accommodations because of a disability should stop by my office within the first week and discuss instructional needs with me. To have a better understanding of each lecture, you should read each section before that day's lecture. ***Mathematics is not a spectator sport.*** Attendance will be taken every day. Your active class participation and daily attendance may be taken into consideration to improve your course grade. Last day to add/drop is January 23rd, while the last day to withdraw is Apr 5th. The final is given on the 15th week. Early Alert warnings will be sent to those students whose performances are questionable. Final exam week is May 1-8, 2024.

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| **Grading policy:** | Homework | 20% | 900-1000 ➔ | **A, A-** |
| | Quizzes | 20% | 800- 899 ➔ | **B+, B, B-** |
| | Exam 1 | 20% | 700- 799 ➔ | **C+, C, C-** |
| | Exam 2 | 20% | 600- 699 ➔ | **D** |
| (cumulative) | Final | 20% | 0- 599 ➔ | **F** |