MAC 6206 – Enumerative Combinatorics

Course Syllabus – Spring 2019

Professor:	Dr. Zvi Rosen
E-mail:	rosenz@fau.edu
Classroom:	SE 215
Office:	SE 224
Office Hours:	TBD after first class meeting
Credit Hours:	3
CRN:	15468
Website:	zvihrosen.com/S2020-6206.html
Prerequisites:	Permission of Instructor

Textbook: *Enumerative Combinatorics, volume 1* by Richard Stanley, available for purchase at the bookstore, as well as for free on the author's website: http://www-math.mit.edu/~rstan/ec/ec1.pdf.

Catalog Description: Introduction to enumeration. Sets and multisets, permutations, sieve methods, partially ordered sets, lattices, incidence algebra, Moebius inversion, and generating functions.

Course Objectives and Learning Outcomes:
Upon successful completion of this course, students will be able to:

1. Manipulate ordinary and exponential generating functions.
2. Apply the theory of combinatorial species to derive generating functions and cycle index series.
3. Apply inclusion-exclusion and other sieve methods to enumeration problems.
4. Describe properties of a partially ordered set.

Course Content: We will cover the first three chapters of Stanley with some sections excluded. We will also make excursions into Bergeron et al to explore Joyal's theory of combinatorial species, and Flajolet-Sedgewick for some asymptotic analysis of generating functions.

Problem Sets: There will be three problem sets posted on the course website, due January 30, February 13, and March 5. Please focus on clarity of presentation and communication in your writeups. The writeup may be submitted via e-mail or in a physical copy during class.
The problems will come from Stanley and various other sources. The solutions are almost certainly available online, but please make every effort to do them yourselves. Working in groups is encouraged, but each person should write up and submit the problems independently.

Presentations: At the end of the semester a number of classes will be devoted to student presentations. The presentations will last 80 minutes (a full class period) and they will be either:

1. Exposition of a topic in combinatorics not discussed in the semester, or
2. Presentation of a research paper in combinatorics.

The first part of this assignment is a written proposal, due March 24, giving an outline of what you would like to present. I will return notes and suggested modifications. The presentations themselves will take place on the last n sessions of the semester.

Grading: The course grade will be composed as follows: 60% Problem Sets, 40% Presentation. Attendance is expected, but is not part of computing the grade.

Tentative Readings Schedule:

Week of	Tuesday	Thursday
January 13	EC 1.1	EC 1.9
January 20	EC 1.2	EC 1.3-1.4
January 27	EC 1.5	EC 1.8
February 3	BLL 1.1-1.3	BLL 1.4
February 10	BLL Appendix 1	EC 1.10
February 17	EC 2.1-2.2	EC 2.3
February 24	EC 2.4	EC 2.5
March 2	EC 2.6	EC 2.7
March 9	Spring Break	Spring Break
March 16	EC 3.1	EC 3.2
March 23	EC 3.3	EC 3.4-3.5
March 30	EC 3.6	EC 3.7-3.8
April 6	EC 3.9-3.10	EC 3.11
April 13	Student Presentations	Student Presentations
April 20	Student Presentations	Student Presentations

Student Accessibility Services: In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodation due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. If you have not yet contacted SAS, and would like to request accommodations or have questions, you can look online at www.fau.edu/sas, call (561)297-3880 or visit their office in SU (80) Room 133. All services are confidential.

Academic Integrity: FAU does not tolerate cheating, plagiarism, or academic dishonesty. You can consult the University's Code of Academic Integrity here: http://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf. These standards will be upheld in this class. If you work with your classmates, please make a note of it. Any cases of academic dishonesty may be referred to the Office of Student Conduct.

Religious Accommodation Policy Statement: In accordance with rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices and beliefs with regard to admissions, registration, class attendance, and the scheduling of examinations and work assignments. For further information, please see Academic Policies and Regulations.

University Approved Absence Policy Statement: In accordance with rules of the Florida Atlantic University, students have the right to reasonable accommodations to participate in University approved activities, including athletic or scholastics teams, musical and theatrical performances and debate activities. It is the students responsibility to notify the instructor at least one week prior to missing any course assignment.

Counseling and Psychological Services: Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to utilize FAUs Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to http://www.fau.edu/counseling/