MATHEMATICS 669: Combinatorics I (Section 1001)  
Spring 2018 Semester  
8:30 – 9:45 p. m. Tuesday & Thursday  CBC C115

Instructor: Dr. Robinette  
Office: CDC 920 (Central Desert Complex building 9, room 920)  
Office Hours: 11:50 – 1:00 Tuesday & Thursday  
Office Phone: (702) 895–0363  
E-mail Address: michelle.robinette@unlv.edu

Text: Introductory Combinatorics, Fifth edition by Richard A. Brualdi

Learning Objectives: 1. Understand and be able to apply the general counting methods for permutations and combinations; 2. Recognize and apply inclusion-exclusion principle; 3. Be able to state and to prove each of the counting principles; 4. Be able to prove combinatorial identities with combinatorial proofs; 5. Understand and apply generating functions; 6. Be able to use series to solve counting problems with generating functions; 7. Solve recurrence relations; 8. Know special sequences such as the Catalan numbers and Stirling numbers and their applications; 9. Understand defining properties of block designs and their constructions; 10. Use permutation and symmetry groups for counting problems applying Burnside’s Theorem and Pólya’s counting formula; 11. Be able to state and prove Burnside’s Theorem.

Notes: Note sheets are available from my website http://faculty.unlv.edu/robinette/robinette.html  
Print your own copy before you come to class. We fill these out together in class. If you miss class, then you are expected to get the notes from one of your classmates. I will not provide notes for days you are absent.

Exams: There will be three 75-minute exams, worth 100 points each. The dates of these exams are February 13, March 13, and April 26.

Homework: Regular assignments will be made. You are to work all problems. A subset of these will be collected and graded each week (on Thursday you will be given the problems that are due to hand in for grading on the next Tuesday). Homework assignments are due at the beginning of class and late homework earns the score of zero. Your homework score will be scaled to 100 points at the end of the semester (for example, if there were 12 homework assignments, worth 10 points each, and you earn 100 out of the possible 120 points available, then your homework score for your final grade would be (100/120) · 100 = 83.3.

Final Exam: The final exam, worth 100 points, will be given on Thursday, May 10, 2018 from 8:00 – 10:00 a. m.

Grading: There are 500 points available in this course coming from your final exam score, your three exam scores, and your homework score. Final grades for the course are based on the following percentage scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>[90, 100]</td>
</tr>
<tr>
<td>B+</td>
<td>[84, 90)</td>
</tr>
<tr>
<td>B</td>
<td>[78, 84)</td>
</tr>
<tr>
<td>C+</td>
<td>[72, 78)</td>
</tr>
<tr>
<td>C</td>
<td>[66, 72)</td>
</tr>
<tr>
<td>D+</td>
<td>[60, 66)</td>
</tr>
<tr>
<td>D</td>
<td>[50, 60)</td>
</tr>
<tr>
<td>F</td>
<td>[0, 50)</td>
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</tbody>
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Grades of A–, B–, C–, and D– may be given in borderline cases, where class attendance and class participation will be determining factors.
Attendance: You are expected to attend class regularly. You are responsible for all the material presented and all announcements made on days you are absent.

Additional Miscellaneous Policies

Academic Misconduct—Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility, and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling at UNLV assume the obligation to conduct themselves in a manner compatible with UNLV’s function as an educational institution. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the Student Academic Misconduct Policy (approved December 9, 2005) located at: https://www.unlv.edu/studentconduct/student-conduct.

Classroom Conduct—Students have a responsibility to conduct themselves in class and in the libraries in ways that do not interfere with the rights of other students to learn or of instructors to teach. Use of electronic devices such as pagers, cellular phones, or recording devices, or potentially disruptive devices or activities, are permitted only with the prior explicit consent of the instructor. The instructor may rescind permission at any time during the class. If a student does not comply with established requirements or obstructs the functioning of the class, the instructor may initiate an administrative drop.

Classroom Surveillance—Nevada Revised Statutes (State Law) 396.970 Surrpentitious electronic surveillance on campus; exceptions. [Effective January 1, 2017.]

1. Except as otherwise provided in subsection 2, it is unlawful for a person to engage in any kind of surreptitious electronic surveillance on a campus of the System without the knowledge of the person being observed.

2. Subsection 1 does not apply to any electronic surveillance:
   (a) Authorized by a court order issued to a public officer, based upon a showing of probable cause to believe that criminal activity is occurring on the property under surveillance;
   (b) By a law enforcement agency pursuant to a criminal investigation;
   (c) By a peace officer pursuant to NRS 289.830;
   (d) By a uniformed peace officer of the Nevada Highway Patrol Division of the Department of Public Safety pursuant to NRS 480.365;
   (e) Which is necessary as part of a system of security used to protect and ensure the safety of persons on the campus; or
   (f) Of a class or laboratory when authorized by the teacher of the class or laboratory.

(Added to NRS by 1993, 2138; A 2015, 575, 3668, effective January 1, 2017) 

Copyright—The University requires all members of the University Community to familiarize themselves with and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you, nor assume any responsibility for employee or student violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: http://library.unlv.edu/provost/copyright.

Disability Resource Center (DRC)—The UNLV Disability Resource Center (SSC-A 143, http://drc.unlv.edu/ 702-895-0886) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Final Examinations—The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: http://www.unlv.edu/registrar/calendars.

Incomplete Grades—The grade of I—Incomplete—can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student’s control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving “I” grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not receive credit for the course and must do not register for courses during the following semester. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Library Resources—Students may consult with a librarian on research needs. Subject librarians for various classes can be found here: https://www.library.unlv.edu/contact/librarians_by_subject. UNLV Libraries provides resources to support students’ access to information. Discovery, access, and use of information are vital skills for academic work and for successful post-college life. Access library resources and ask questions at https://www.library.unlv.edu. 

Rebelmail—By policy, faculty and staff should e-mail students’ Rebelmail accounts only. Rebelmail is UNLV’s official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students’ e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu. Emailing within WebCampus is acceptable.

Religious Holidays Policy—Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor within the first 14 calendar days of the course for fall and spring courses (excluding modular courses), or within the first 7 calendar days of the course for summer and modular courses, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit: http://catalog.unlv.edu/content.php?coid=68&noid=531.

Transparency in Learning and Teaching—The University encourages students to use a transparency template to discuss with their instructors how assignments and course activities benefit student success: https://www.unlv.edu/sites/default/files/page_files/27/TILT-Framework-Students.pdf

Tutoring and Coaching—The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit http://www.unlv.edu/asc or call 702-895-3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of SSC A (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TBE second floor.

UNLV Writing Center—One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC 3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student’s Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. More information can be found at: http://writingcenter.unlv.edu.