MAD 4203 – INTROD TO COMBINATORICS   FLORIDA INT'L UNIV.
INFORMATION SHEET (Aug. 22nd, 2023)                                     FALL 2023

INSTRUCTOR:  Prof. Ram,   Office hours: 12:45pm-1:45pm & 3:30pm-4:45pm Tu &Th.

Prof Ram's homepage: <http://faculty.fiu.edu/~ramsamuj/>  Prof Ram's e-mail: ramsamuj@fiu.edu

Ram’s Zoom ID: 722 280 1561.

LA hours (tentative): Michael ILYIN 6pm-8pm MWF, via Zoom. *Meeting ID:  812 959 4200*

PREREQUISITE: Discrete Math (MAD 2104) & Calculus II (MAC 2312) – C grades or better.
A student needs to know PROOFS to succeed in this course and MAD 3305 is also very useful.

TEXTBOOK:  Introductory Combinatorics (5th. ed.) by Richard Brualdi (Prentice-Hall, 2010)

SYLLABUS: Below are the relevant sections for about 94% of the course.
             1. Permutations & Combinations on sets:  Ch.2 Sec. 1, 2, 3, 4, 5.

             2. Permutations & Combinations on multi-sets: Ch.4 Sec. 1, 2.
             3. The Binomial Coefficients & its uses:          Ch.5 Sec.  1, 2, 3, 4, 5.
             4. Inclusion-Exclusion Principle & its uses:        Ch.6 Sec.  1, 2, 3, 4, 5.
             5. The Pigeon-Hole Principle & its uses:        Ch.3 Sec.  1, 2, 3.
             6. Difference Equations & their uses: Ch.7 Sec.  1, 2, 3.
             7. Generating Functions & their uses:    Ch.7 Sec.  4, 5, 6, 7.
             8. Special Counting Sequences & their uses      Ch.8 Sec.  1, 2, 3.

EXAM & ATTENDANCE POLICIES:

 1. For each exam you are required to bring your Student ID and a blank blue exam booklet.

 (8"x11" available from FIU bookstore). No notes, calculators or cellphones are allowed.

 2. A make-up test for Exam #1 will be given - only if there is a verifiable case of illness or

 emergency. If you miss Exam #2 for one of the same reasons that test will be discounted,

 your grade will be calculated out 260, & you won’t be eligible for an INCOMPLETE grade.

 3. Any misconduct will be reported and dealt with according to the Code of Student Conduct.

 4. Sanctioned religious holidays can be accommodated with early notification (1st wk classes).

 5. FIU uses an Early Alert System – if an alert is submitted, you must contact your advisor.

 Attendance is mandatory. FIU will give you an automatic F for less than 60% attendance.

SCHEDULE OF EXAMS: No calculators, cell-phones, or notes are allowed in the exams.
Test #1      (**100** points):    THURSDAY**,    OCT.    05th,**  11:00am - 12:15pm
Test #2      (**100** points):    TUESDAY**,    NOV.    21st,**     11:00am - 12:15pm
Final Exam (**160** points):    THURSDAY**,    DEC.    07th, 09:45am - 11:45pm\***
**Attendance & class participation** (**40** pts): **3** pts is deducted for each absence or missed exam.

\* The final exam will be comprehensive – please note the time is earlier than the regular class.

GRADING SCHEME:  The grades will be assigned as indicated below.

 F        D        D       D      C      C       C+       B-       B        B+      A-        A
 |            |         |         |         |          |         |          |           |          |          |           |        |
 0%     48      52       56     60      64      68       72       76       80       85       90     100%

 0 188pts 240pts 288pts 320pts 360pts 400pts

HOLIDAYS:  Mon. Sep. 4th (LabD), Fri. Nov 10 (VetD), Thu-Sat Nov.23rd-25th (ThGD).
DEADLINES: For add/drop (no liability) Aug. 28th; for DR/WI grade (no refund) Oct. 30th.

**DETAILS FOR GETTING EXEMPT FROM AN EXAM & FOR GETTING AN “IN” GRADE.**

1. The first (and most important) rule at FIU is that each professor should treat every student in the same uniform way - unless we get documentation from an independent authority (such as the FIU Health Clinic, the FIU DRC, or an MD (medical doctor), etc.) or from a supervisor of the professor (such as the Division Chair-person, the Department Chair-person, or the Dean of the relevant College, etc.) to do otherwise. If the professor does not abide by this first rule, they can be fired.

2. So if a student is not feeling physically or mentally well before an exam, they should contact the FIU Health Clinic, or the FIU Counselling & Psychological Services (see below for the links), or your doctor – and get an a signed letter that specifically says: ”***Ms. X (or Mr. Y) is medically unable to take any exam on such and such a day. Please excuse Ms. X (or Mr. Y) from taking this exam on this specific day***.” *We are not authorized to know of the specific medical condition you may have*.

3. If this is the first exam in the course, the professor will attempt to give the student a make-up exam (if the student is able to take such an exam before the DR deadline) - so that the student can be have some feed-back about their performance before the deadline for getting a DR grade). Because of time constraints it is not possible to give a make–up exam for the last in-semester test before the final exam.

4. In order to get an “IN” grade (in which just the final exam needs to be completed during the next semester), a student must complete more than 50% of the graded material (i.e., the first two exams) and earn a passing grade so far. So if a student was exempted (for any of the reasons above) from the second exam, then that student does not qualify for an “IN” grade. Also if the student does not have a passing a grade when the first two exams are averaged, then that student does not qualify for an “IN” grade. This is an FIU rule – and all professors have to abide by it. We have to fill out a form and provide the documentation before any ”IN” grade can be entered.

5. If you missed the first test in the semester for an allowable, legitimate, verifiable reason you may be able to take a make-up exam as long as you provide adequate documentation and notify the professor at within two hours of the scheduled exam time. You must take the make-up test on the first opportunity you get to return to school. The allowable reasons are restricted to medical emergencies, traffic accidents in which your car becomes non-functional on your way to the exam, and deaths in the immediate family (parents, siblings, or children). We are not allowed to give make-up tests for work related issues. As always you must provide documentation. If you’re exempted from the 2nd exam, you will not get a make-up; your other scores will instead be used (with their corresponding weights) to produce your final grade – but in this case, please remember that you won’t qualify for an IN grade.

6. So please go & seek whatever medical treatment you may need- and get the necessary documentation - instead of telling the professor just a few minutes before the exam that you are unable to take it. Our hands are tied – we have to get documentation before we can give any make-up exam or exempt you from an exam. And if we give make-up exams or exemptions without documentation we can be fired and even be sued. If you have any questions about this matter, please contact the Math Division Director or the Math Undergraduate Program Director. Below are two useful links if you are not feeling well.

A. https://studentaffairs.fiu.edu/health-and-fitness/student-health/

B. <https://studentaffairs.fiu.edu/health-and-fitness/counseling-and-psychological-services/>

MAD 4203 - INTROD TO COMBINATORICS FLORIDA INT'L UNIV.

HOMEWORK SHEET FIFTH EDITION

NEW TEXT BOOK: Introductory Combinatorics (Fifth Edition) by Richard A. Brualdi

 (Prentice Hall Inc., an imprint of Pearson, 2010)

FOR ANSWERS: See Prof. Ram's webpage http://faculty.fiu.edu/~ramsamuj

Solutions to HW Problems: Ch.2&4 (p.1-20) Ch.5&6 (p.21-36) Ch. 3 (p.37-50)

 Ch.7 (p.51-75) Ch.8 (p.76-84)

Ch.2 Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 27, 28

 30, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 47, 48, 49. (5th ed.)

Ch.4 Nos. 1, 2, 4, 6, 7, 8, 9 (5th ed.)

Ch.5 Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15, 16, 18, 19, 23, 24, 25, 29

 30, 31, 35, 36, 37, 39, 40, 41, 42. (5th ed.)

Ch.6 Nos. 1, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, (22, 23 maybe). (5th ed.)

Ch.3 Nos. 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 23. (5th ed.)

Ch.7 Nos. 1, 2, 3, 4, 6, 8, 9, 12, 13, 14, 15, 18, 19, 20, 22, 24, 25, 26, 27, 28,

 31, 32, 33, 34, 35, 36, 38, 42, 43, 44, 46, 47, 48. (5th. ed.)

Ch.8 Nos. 1, 6, 7, 8, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 26, 27, 31. (5th ed.)

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OLD TEXT BOOK: Introductory Combinatorics (Fourth Edition) by Richard A. Brualdi

 (Prentice Hall Inc., 2004)

Ch.3 Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 20, 28,

 30, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44. (4th ed.)

Ch.4 Nos. 1, 2, 4, 6, 7, 8, 9 (4th ed.)

Ch.5 Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15, 16, 18, 19, 23, 24, 25, 27

 31, 38, 39, 40, 41. (4th ed.)

Ch.6 Nos. 1, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 18, 21. (4th ed.)

Ch.2 Nos. 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 23, 27. (4th ed.)

Ch.7 Nos. 1, 2, 3, 4, 6, 8, 9, 12, 13, 14, 15, 16, 19, 23, 24, 25, 26, 27, 28, 29,

 30, 31, 32, 36, 37, 38, 40, 42. (4th. ed.)

Ch.8 Nos. 1, 6, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 26. (4th ed.)