Instructor: M. Stanley

Office Hours: 4:30–6 p.m., Tuesdays and Thursdays in MH316, while classes are in session.

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Email: maurice.stanley@sjsu.edu

Class website: http://www.math.sjsu.edu/~stanley/42/42.html


Prerequisites: Math 19 (with a C or better); more generally, eligibility for Math 30 or 30P.

Grading: There will be nine homework assignments to turn in, two class-length exams during the term, and a final exam. *Use of calculators, computers, notes, or other aids will not be allowed on exams.* You will get the the higher of two grades calculated as follows. The first grade is given by

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
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<tbody>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>First exam</td>
<td>28%</td>
</tr>
<tr>
<td>Second exam</td>
<td>28%</td>
</tr>
<tr>
<td>Final exam</td>
<td>34%</td>
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</tbody>
</table>

The second grade is calculated using this same formula after replacing the minimum of your first midterm, second midterm, and homework grades. If one of the midterm grades is lowest, it is replaced by the weighted average of your grades on the other midterm and the final exam. If your homework grade is lowest, it is replaced with the weighted average of your two midterm and final exam grades. The weighting of exam scores in these averages is the same as the above contributions to final grades.

Here is the spreadsheet formula that will be used:

\[
\text{max}(0.28\times nx1 + 0.28\times nx2 + 0.10\times nhw + 0.34\times nf, \\
\quad \text{if } (nx1 = \text{min}(nx1, nx2, nhw), \\
\quad \quad 0.28\times (0.45\times nx2 + 0.55\times nf) + 0.28\times nx2 + 0.10\times nhw + 0.34\times nf, \\
\quad \quad \text{if } (nx2 = \text{min}(nx1, nx2, nhw), \\
\quad \quad \quad 0.28\times (0.45\times nx1 + 0.55\times nf) + 0.28\times nx1 + 0.10\times nhw + 0.34\times nf, \\
\quad \quad \quad \quad 0.28\times nx1 + 0.28\times nx2 + 0.10\times (0.31\times nx1 + 0.31\times nx2 + 0.38\times nf) + 0.34\times nf))))
\]

where \( nx1, nx2, nhw, \) and \( nf \) are, respectively, “normalized” scores on the each of the two midterms, the homework, and the final exam. After each exam I will work out a “normalized” grade scale. A perfect score is worth 100; the lowest A is worth 90; the lowest B, 80; and
Intermediate scores are distributed linearly in these intervals. For example, if the lowest A on an exam is a raw score of 25 points and the lowest B is 21, then a raw score of 23 corresponds to a normalized score of 85. It is these normalized grades that will be weighted in the above formula to calculate final grades.

The two midterm exams and the final will consist of problems similar to those in the homework. The final exam will be comprehensive, though it will emphasize material covered after the second exam, since that material will not have appeared on earlier exams. The final exam will be in our usual class room, Section 9 (3:00 class) on Thursday, December 14, 2:45 till 5:00 pm; Section 11 (7:30 class) on Thursday, December 14, from 7:45 till 10:00 pm.

The homework assignments will be posted on the class web site. Each homework assignment will count 20 points. Of these, 5 points will be awarded for apparent completeness of the work. The remaining 15 points will be given for spot graded problems. After dropping your lowest homework score, the total of your remaining nine scores will be assigned grades as follows:

- \( A \): 140–160 points
- \( B \): 120–140 points
- \( C \): 100–120 points
- \( D \): 80–100 points
- \( F \): fewer than 80 points

\textbf{No late homework will be accepted.}
\textbf{No make-up exams will be given.}
\textbf{There is no extra credit.}

The way you will learn the material in this class is by \textit{working} the homework problems. This is a three unit course, so \textit{you should expect to devote a minimum of nine hours per week to Math 42.}

Heroes of the Internet have posted complete solutions to all of the homework problems. You can get a perfect score on the homework problems by simply copying them and turning them in. This will earn you a solid 10% in the course. \( C^- \)'s begin at 70%. Only by working the problems yourself will you learn the subject. When you do the homework, imagine that you will have to be able to solve similar problems quickly on an exam, without being able to look at examples in the text, and without even knowing which section of the text the problems are from. If you can’t, do more similar problems till you can.

After the calculation described above, final grades are given by the following scheme:

- \( A \): 91–100
- \( A^- \): 90–90.99
- \( B^+ \): 89–89.99
- \( B \): 81–88.99
- \( B^- \): 80–80.99
- \( C^+ \): 79–79.99
- \( C \): 71–78.99
- \( C^- \): 70–70.99
- \( D \): 60–69.99
- \( F \): < 60

One final rule in calculating final grades is that a passing course grade (\( C^- \) or better) requires a grade of \( C^- \) or better on at least one exam.

An \( A \) is an excellent grade; a \( B \) is a very good grade; a \( C^- \) is a barely passing grade.
Workshops: Taking a Math 42 workshop, a section of Math 42W, is not required, but it is highly recommended. There is no better place to get help with the homework. As yelled above, the homework is key to doing well in the class. Statistically, students who take a workshop do better in Math 42. To enroll in a section of M42W, attend the one you want, and get an add code from the “facilitator”.

Learning objectives: Successful students should be able to do the following:

1. Translate English sentences to and from propositional and predicate logical languages.
2. Apply the formal semantics of these languages to determine the truth values of formulas in these languages.
3. Formalize arguments in natural language as deductions in these formal languages.
4. Recognize and classify logical errors in reasoning.
5. Describe methods of mathematical proof.
6. Construct elementary direct proofs, proofs by contradiction, and indirect proofs.
7. Construct elementary proofs by ordinary mathematical induction, strong induction, structural induction, and by appeal to the well-ordering principle.
8. Determine the truth of statements and provide proofs regarding naive set theory.
9. Determine the truth of statements and provide proofs regarding elementary number theory.
10. Determine the truth of statements and provide proofs regarding abstract functions, binary relations, elementary graph theory, and Boolean algebras.
11. Demonstrate the ability to perform calculations using the Euclidean algorithm and Chinese Remainder Theorem.
12. Demonstrate basic ability in counting permutations and combinations and in the use of the Pigeon Hole Principle.

General information.

SJSU classes are designed so that in order to be successful, it is expected that students in a 3 unit class, such as Math 42, will spend a minimum of 9 hours per week participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at [http://www.sjsu.edu/senate/docs/S12-3.pdf](http://www.sjsu.edu/senate/docs/S12-3.pdf)

I encourage you to talk to other students about the homework problems, seek help in a workshop, seek help in the Math Lab, and seek help through Peer Connections. Searching on line for help, or asking for help in forums is not as good, because the help does not have the same context as the course, so is less reliably useful in it. In any case, even if you got ideas for it elsewhere, your homework write-up must be your own. All exams are taken without help or aids, so it is important to really understand the homework problems.

For information about accommodations for disabled students and academic integrity responsibilities for SJSU students refer to the official Math Department greensheet online at [http://www.sjsu.edu/math/courses/greensheet/](http://www.sjsu.edu/math/courses/greensheet/).