**Math 231 Discrete Math Spring 2019**

**CRN 22239 Monday, Wednesday 3:15 - 5:15 Grandview 110**

**Instructor:** Becky Plassmann

office: Grandview 219, Bend Campus

office phone: (541) 383 - 7726 (also use for messages)

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e-mail address: rplassmann@cocc.edu (notice: starts with r, then 2 s's, 2 n's)

I prefer that you use your COCC email when you write to me, and make sure you specify which class you are in. Make sure to fill in the subject line!

web: course information and grades on BlackBoard.

**Office hours:** This is when I’m guaranteed to be in my office. Just show up.

Office (Grandview 219) Tuesday, Thursday 1:00 - 3:30 pm.

Additional time is available by appointment -- or if you catch me in my office. You'll notice that I have provided both my office and home phone numbers. Please feel free to call me with questions; I'm a pretty good math coach over the telephone!

**Class Communication:** Please be sure that you know how to check your college e-mail and BlackBoard, and that you check them regularly. During the term I will post updated grades, any announcements that need to be made outside of class time, and copies of handouts, to BlackBoard or your COCC email.

**Required Texts:** Discrete Mathematics with Applications, Second Edition, Susanna S. Epp ISBN 0-534-94446-9

Here’s some important news about your textbook for Discrete Math – instead of having you buy a new (and expensive) book from the bookstore, I would like you to go online and find a copy of “Discrete Mathematics with Applications”, **Second Edition**, by Susanna S. Epp. It’s a good book, and you should be able to get it very inexpensively ($5 - $20).

ISBN 0-534-94446-9

Search any website that sells used books, such as ABE Books, Bookfinder, or Amazon, using this ISBN.

**Prerequisites**: You should have recently completed COCC's Math 112 or its equivalent with a grade of B- or better.

**KEEP AN ORGANIZED NOTEBOOK!**

**COCC Course Description:** Topics in the course will examine in detail the applied, real-world and theoretical mathematical implications of the mathematical concepts elementary logic and set theory, functions, direct proof techniques, contradiction and contraposition, mathematical induction and recursion, elementary combinatorics, basic graph theory, minimal spanning trees. The symbolic, numerical and graphical representations of the mathematical concepts will be expanded and explored. Emphasis will be on solving problems symbolically, numerically and graphically and understanding the connections among these methods in interpreting and analyzing results.

**COCC Learning Outcomes:**

1. Apply basic set operations.  
2. Negate compound and quantified statements and form contrapositives.  
3. Construct a direct proof (from definitions) of simple statements.  
4. Apply the Principle of Mathematical Induction.  
5. Construct indirect proofs by contraposition and contradiction.   
6. Construct explanations for solutions to counting problems.   
7. Utilize one or more algorithm for finding a shortest path or a minimal spanning tree in a connected graph.

**Learning Methods:** Material will be provided with in class activities, lecture, reading, handouts, and especially homework. You are responsible for all material covered in class and in the reading.

**Classroom behavior:** We are here to work and to learn. I will be here every day (unless I'm sick), prepared and excited to teach. I expect you to be at class on time, and to stay until the end, unless you have checked in with me beforehand. I expect us all to be respectful of the classroom environment and of everyone in the class. Specifically, we must all abide by the guidelines explained in the COCC Student Rights and Responsibilities Handbook. The most up-to-date version of this handbook can be found at:

<https://www.cocc.edu/policies/general-procedures-manual/student/student-rights-and-responsibilities.aspx>

Any violations of COCC’s student rights and responsibilities policies will be reported to Office of Student Life.

**Please do not use your cell phone, tablet, or computer during class for anything unrelated to the class.** Using your cell phone as your calculator is ok, but have the ringer turned off, and do not text during class -- it's too distracting for you, for me, and for your fellow students. Studies show that every time you check your phone, it can take up to twenty minutes to return to being focused on what you were doing! Remember that smart phones were actually designed to distract your attention. Students who bring their cell phones to class can have final grades that average one whole letter grade below their classmates.

**Questions?** If you have any questions or concerns about the class please bring them to my attention as soon as possible. I can only address issues that I know about, so please take the time to talk to me when needed. You are welcome to speak with me outside class, email me, or leave a note at my office. Also, you are welcome to consult Kathy Smith (541-383-7418), the mathematics department chair, at any time.

**Americans with Disabilities Statement:**  Students with documented disabilities who may need accommodations, who have any emergency medical information the instructor should know of, or who need special arrangements in the event of evacuation, should make an appointment with the instructor as early as possible, no later than the first week of the term. Students may also wish to contact the COCC Disability Services Office in the Barber Library, (541) 383-7583. <https://www.cocc.edu/departments/disability-services/>

**COCC Non-Discrimination Policy:** It is the policy of the Central Oregon Community College Board of Directors that there will be no discrimination or harassment on the basis of age, disability, sex, marital status, national origin, ethnicity, color, race, religion, sexual orientation, gender identity, genetic information, citizenship status, veteran status, or any other protected classes under Federal and State statutes in any educational programs, activities or employment. Persons having questions about equal opportunity and nondiscrimination should contact the Equal Employment Officer, c/o COCC's Human Resources office, (541) 383-7216.

**Title IX Statement:** Title IX protects people from discrimination based on sex in education programs and activities. This includes conduct such as: gender discrimination (includes males, females, transgender, gender identity, etc.), sexual harassment, sexual assault, stalking, intimate partner/relationship violence, bullying and cyberbullying, retaliation, the failure to provide equal opportunity in athletics, and discrimination based on pregnancy. Students having questions about Title IX should contact Alicia Moore, Dean of Student and Enrollment Services, (541) 383-7244, [amoore@cocc.edu](mailto:amoore@cocc.edu).

**Undocumented Students:** If you are an undocumented student, or if you know someone who is undocumented, be sure to check out resources available to you at COCC, including financial aid: <https://www.cocc.edu/departments/multicultural/latino/undocumented-student-resources/>

**Everyone is welcome -- we're glad you're here!**

**Evaluation**

**Homework:** It is extremely important that you do your homework thoroughly and well. Remember, the way to learn mathematics is by practicing it -- mathematics is very active, it's all about doing, not just listening. I will assign homework for you to try every day, and it will be due at 5:15 pm on the class day after the assignment. Please ask me about anything you don't understand -- either during or outside of class. Late homework will be accepted up to one week past the original due date, and will be penalized 20%.

* Write neatly and legibly; I will only grade problems I can read. Write your solutions so that *anyone* reading your paper can follow the flow of your solution. Organization is important, as is proper use of terminology and notation. If you use a spiral notebook, please cut off the ragged edges before turning in your papers.
* Copy the problem; for word problems, copy just the important information.
* Show your work. Justify all answers with supporting work. Objectives for this course include not only being able to do the mathematics correctly but being able to understand and effectively communicate your process.

**Quizzes:** We will also take quizzes during class -- in discrete math, there are several skills that we'll just have to memorize and practice. We will be doing quizzes during class to help you master these skills.

**Tests:** You will take tests in our normal classroom during our normal class times. Exams will be proctored. You will not be allowed to consult your notes or textbook during any exam, unless otherwise specified. You must show your work for full credit. There will be parts of some tests where you will not be allowed to use a calculator.

***If you are going to miss an exam you MUST make prior arrangements for making up that exam. Failure to make prior arrangements WILL result in a zero for that test.***

**Evaluation**: Your grade will be based on:

Homework: 30%

2 Exams plus the Final: 70%

**Grading Scale (measured in percents)**:

100 **A**  93 **A-**  90 **B+**  87 **B**  83 **B-**  80 **C+**  77 **C**  73 **D**  65 **F**

**Cheating or Plagarism** on any assignment or test will result in a zero being recorded for that item, and may result in an F for your final course grade. Cheating or plagarism will also be reported to the Office of Student Life.

**If you want to drop the class,** you must turn in a drop slip at the Boyle Center in Bend. If you don't formally drop the class, but just stop coming, you will still be responsible for a grade. After the first week, I cannot drop you from the class. After the seventh week, you'll need my signature to drop the class -- I'll almost certainly sign your drop slip, but I'll ask you to tell me about what went wrong, and what you can do differently next time you take the class.

**Ideas for Increasing Your Success in Math Class**

* **Attend every class**. Missing one class can put you two classes behind. Not only will you be behind the material covered in the class you missed, but you will have difficulty following the new material being covered when you get back. Take complete notes in class -- by taking notes, you will have a permanent record of the material covered in class.

**Attend class every day -- it's the FIRST thing you should do to succeed.**

* **Put your phone away** during class and when you’re studying, unless you're using it as part of your studying. When you allow distractions into your study time, you’re sabotaging your own learning.
* **Form a study group**. Get the phone numbers or emails of other students in the class and make a habit of contacting each other to compare homework questions and answers. Research shows that students who study **together** learn more effectively.
* **Set aside enough time to study**. You should be studying about two hours for every hour you spend in class. That's about eight hours a week for this class. Set aside regular study times, and stick with them! Some studying every day is the easiest way to learn.
* **Start studying as soon after class as possible**. This will allow you to work while the information from class is still fresh and will allow you time to get help when you need to.
  + First go over your notes and fill in any details and questions you missed during class.
  + Read the corresponding section of the textbook, or look up online resources that cover the same material. Some students like to read the text twice – once before the class covering that material, then again after the material has been discussed in class. Rework examples from class or work through examples in the corresponding section of the text. Do enough practice so that you're really confident that you understand the ideas.
  + Then do the written homework problems -- this is the part of your homework that gets graded. After you've done your homework, check it with the answer keys I've provided before you turn it in. Notice anything that needs to be fixed, and fix it. If it doesn't make sense, make sure you ask questions!
* **Do some of your studying on your non-class days**. This will help your brain understand that this information is important and something it needs to hold onto. Try to do some math studying – reviewing, homework, previewing future sections, organizing, at least 5 days a week.
* **Write out all homework as though your final grade depends on others being able to interpret and evaluate what you are capable of doing.** Practice makes permanent (not necessarily perfect), so your work should reflect what you want your brain to remember.
* **Do every assigned problem**. If you get stuck, you have several options:
  + Try a similar problem which has an answer provided – these are available in the textbook.
  + Ask a classmate or a member of your study group.
  + Come see me or e-mail me.
  + Make sure you get help before the next class – you want to be ready to learn the new material.
* **Do extra problems if you need extra practice.** Set aside part of your study time to go back and review old homework, especially any problems that you struggled with the first time through. There are a lot of problems in the textbook.
* **Look over the sections we will be covering BEFORE class**. In this way, you'll have a head start on understanding everything that's covered in class.
* **Remember that everyone can learn mathematics**. The most common mistakes leading to failure to learn are not giving yourself enough time to study and not asking enough questions -- come to office hours whenever you have questions!
* **Need more help?** Read the book Mastering Mathematics: How to be a Great Math Student by Richard Manning Smith. It's available in the bookstore, on reserve in the library, at the tutoring center, and in my office.
* **Remember that mathematics is much more than knowing any particular theorem or formula, or being able to solve any one kind of problem.**
  + Mathematics is about the process of problem solving -- of being able and willing to think about how to solve a problem when it's not clear where you should start.

* + Mathematics is about extending the understanding you have in order to propose and solve different, more interesting, or more difficult problems.
  + Mathematics is about being able to explain what you've done so that someone else can follow and understand your work.

**Tentative Schedule – Math 231 – Spring 2019**

**Week 1:** Must come to class every day to remain registered. Instructor's signature is required to add any class. Introduction to Logic.

**Week 2:**  Friday is the last day to receive 100% tuition refund. Tuition is due on Friday. Logic and Introduction to Proof.

**Week 3:**  No tuition refunds. Late registration fees begin. More about Proof, Introduction to Sets.

**Week 4:** Mathematical Induction, Recursion. Test 1 on Wednesday.

**Week 5:**  Mathematical Induction, Recursion.

**Week 6:**  Midterm grades are mailed on Tuesday to students earning a D, F, or W. It is your responsibility to drop any class you need to. Principles of Counting.

**Week 7:** Friday is the last day to add a class, or to change to audit. Friday is the last day to drop a class and have no entry on your transcript. More about Counting. Introduction to Graphs.

**Week 8:** Instructor's signature is required to drop any class. More about Graphs. Test 2 on Wednesday.

**Week 9:**  **Monday is a holiday -- Memorial Day.**  More about Graphs. Introduction to Trees.

**Week 10:** Wednesday is the last day to drop any class; you must have your instructor's signature. More about Trees. Review as needed.

**Finals Week:** There are no classes during finals week, only the final exam.

Official Exam Time: Monday, June 10, 3:15 - 5:15 pm.

The final exam will cover all of the material from this course, and will take two hours. Changing the time of your final exam requires my permission, and the permission of the mathematics department chair. Such permission will only be granted in extraordinary circumstances.