

Math 216-01, 216-02 – Discrete Structures
Fall 2021 Syllabus

Information below is subject to change. Students will be notified of any changes.

DISCRETE STRUCTURES

3 credits. Course Prerequisite: MATH 108 with a C or better, or MATH 140, 171, 172, 182, or 202 or concurrent enrollment. Discrete mathematics, trees, graphs, elementary logic, and combinatorics with application to computer science. Recommended preparation: Programming course.

INSTRUCTOR: Prof. Alexander Panchenko.

Email: panchenko@wsu.edu Use “MATH 216” as the subject of the email.

Office: Neill 329.

The best way to contact the instructor is during office hours. Please expect a delay of 1 – 2 business days for a response to any email. Before you hit send on your email, ask yourself if the question can be answered by looking at the syllabus or discussion boards on Blackboard. You can save yourself a lot of time by looking there first. Remember that the Math Learning Center is available for virtual help with questions on math concepts we discuss in this course.

TA: The TAs are still being assigned. Their contact information & office hours will be updated soon.

MEETING TIMES

Section 01 meets M, W, F 9:10-10:00 in SPARK 335.

Section 02 meets M, W, F 14:10-15:00 in TODD 311.

INSTRUCTOR OFFICE HOURS

M, W, F 3:15-5:00 and by appointment. Office hours are held in person in Neill 335. Zoom meeting are possible upon request.

If you are unavailable during the posted office hours but would like to meet, email the instructor to set up an appointment for another time. Use “MATH 216” as the subject of the email and include your availability in your email request (please send 2-3 available meeting times).

REQUIRED MATERIALS & TECHNOLOGY

Textbook: Discrete Mathematics with Applications, by Epp, 5th Edition © 2020.

- Wi-fi, internet and computer access.

You will submit written homework by taking pictures or scans of your work to submit online. You will access lecture videos, class notes and complete other coursework using Canvas. This means you will need a reliable computer and wi-fi. See the “technology issues” section below for more technology information and resources.

Recommended technology: camera or scanner to take pictures of work to submit online (this can include a smart phone or other device which can be used to take a picture).

COURSE DESCRIPTION

This course will go through a lot of topics. We will start with basic logic, and expand that to formal statements, arguments, then proofs. This will then be applied to number theory, counting and probability, set theory, and graph theory.

EXPECTATIONS OF STUDENT EFFORT

Students are expected to attend all class meetings, and complete any assignments required for the day. Outside of class students can expect to spend about 9 hours per week engaged in the following types of activities: reading, listening/viewing media, discussion, completing assignments and reviewing instructor feedback, studying for and completing assessments, etc. Students are expected to complete all assignments on time, when not possible, contact me as early as possible. Students are expected to take care of all potential technical issues as soon as possible. (See Technology Issues below).

Late HW submission policy: you will receive no credit for assignments which are more than 7 days past due. Exceptions are made by permission of the instructor. This permission must be requested in writing within the 7 days of the due date. The permission will be granted rarely in cases of major health and family emergencies.

You are expected to attend and actively participate in each scheduled class period. It is recommended that you attend the class meetings to increase your chance of success! Reading assigned materials prior to each class, taking good notes during class, asking relevant questions, and working through problems when asked to do so are just a few ways you can actively participate in class.

LEARNING OUTCOMES

Students will be able to:

- Understand and apply simple logical statements, predicates, quantified statements, and arguments.
- Understand elements of number theory, rational numbers, divisibility, sequences.
- Expand upon arguments to create proofs of several types: including cases, indirect proofs, and mathematical induction proofs.
- Understand set theory, probability theory, equivalence relations and applications.
- Understand and apply ways of counting the number of elements in a set from a description of the set.
- Analyze graphs: discover various paths through them and types of graphs.

GRADE COMPOSITION

Comprehensive Final Exam	36 Modules (5 pts each, drop 6)	100 points	25 %
Written Homework	13 HW (10 pts each, drop 3)	100 points	30 %
Weekly Surprise Quiz	10 points each, offered in class only, no makeup		5 %
Midterm exams	2 written in-class exams	200 points	40 %
	Total:		100%

Final Letter Grades

91% – 100%	A	72% – 76.99%	C
89% – 90.99%	A-	69% – 71.99%	C-
86% – 88.99%	B+	67% – 68.99%	D+
83% – 85.99%	B	60% – 66.99%	D
80% – 82.99%	B-	0% – 59.99%	F
77% – 79.99%	C+		

The grade cut-offs may be changed (slightly) based on the actual group performance at the discretion of the instructor.

MIDTERM EXAMS

Two 50 min long in-class written exams. The exams are open book, open notes. However, electronic devices are not allowed. The coverage is based on the Schedule. The dates of the midterms are

Midterm 1: Friday, Sept. 24.

Midterm 2: Friday, Oct. 29.

FINAL EXAM

2 hour long written comprehensive exam offered during the Finals week in accordance with the WSU Final exam schedule on Thursday, 12/16 8:00-10:00. Room TBA.

If you have a time conflict with any exam, let the instructor know as soon as possible but no later than one week prior to the scheduled exam. Please note that if you have access center accommodations for exams, you must notify your instructor as soon as possible to make further arrangements.

SCHEDULE

The course schedule can be found in the Canvas course space. The schedule may change periodically to reflect the pace of the course as we progress through the semester. Refer to it often to stay updated on the course coverage and assignment deadlines. All times are in Pacific Standard Time. Students are encouraged to refer to the WSU academic calendar often to be aware of critical deadlines throughout the semester. The WSU academic calendar can be found at this website:

<http://registrar.wsu.edu/academic-calendar>.

WRITTEN HOMEWORK

Written homework assignments will be posted on Canvas and are due by 11:59pm on the assigned due dates. Check the schedule for deadlines. Written homework will be submitted electronically using Canvas.

It is your responsibility to double check that all your images have been uploaded correctly and oriented upright for full credit. You will get penalized if your image is too blurry, too dark, upside down or sideways. It is important that you upload your work for a particular problem in the space provided for that problem and not in the space for another problem. Do not use email to submit the homework to the instructor or TA. Late assignments which are more than 7 days past due are not accepted. Show all your work toward your solution. An answer with no work shown will receive a score of 0 points. Each homework grade is found by taking the percentage you earned and multiplying it by 10 points. The best 11 written homework scores will be included in your final grade.

To complete your homework, you can do either of the following:

- Use a clean piece of paper to work through the problems, writing your solutions by hand. Show all work! You may scan your work and save it as a pdf or take a picture of your written work and upload your image to Canvas
- Use a stylus pen and tablet to write out your responses and submit screenshots of your work to upload to Canvas. Show all work!

Before you start any homework assignment, review your notes and read the book. There is a lot of notation in this book, and the only way to get familiar with it is to read and practice. If you get stuck on a homework problem, do a problem that is similar to it, as some answers are in the back of the book. Not every section for which there is work will be covered in class. This is deliberate—you will be expected to read and understand these sections of the book yourself.

SURPRISE QUIZ

Will be offered in class approximately once a week without prior announcement. The quiz will be focused on proof writing and cover about a week of current material. No make-ups are possible, except in cases of a documented major emergency.

INCOMPLETE GRADE

You must complete at least 75% of all course material to request an incomplete. University policy (Academic Regulation 90): states that Incompletes may only be awarded if: "the student is unable to complete their work on time due to circumstances beyond their control".

STUDY ASSISTANCE AND TUTORING OPPORTUNITIES

Successful students make use of available resources, so don't struggle when help is just a few steps away. We want you to succeed, we're here for you, and our tutoring services are completely FREE.

The Math Learning Center (MLC) will continue to offer virtual tutoring via Zoom this semester. You can find current information on how to connect with a tutor on our website: <http://www.math.wsu.edu/studyhalls/welcome.php>

In addition to virtual tutoring, the MLC will also host a forum where students can post questions to be addressed by our MLC tutors as well as provide an opportunity to connect with other students taking the same course. Visit <https://mathlab.math.wsu.edu/phpBB3> and create an account to start connecting with our tutors. (Note: This is a monitored forum. Please read the guidelines posted on the forum before posting.)

Come see me during office hours! I am here to help you. It is my goal to see you succeed in this class and future classes.

ENGLISH WRITING LAB

Writing proofs is more of a writing exercise than a math exercise. WSU does provide a writing lab to assist: <https://writingprogram.wsu.edu/undergraduate-writing-center/>. They may not be able to help with the math, but they can help with the clarity.

TECHNOLOGY ISSUES

Don't wait until the last minute to complete online homework or access your course materials online. Technology fails so give yourself time to troubleshoot the problem and still meet the deadlines or work ahead when you can. You should be prepared with a backup plan. For each class meeting and assignment, some things to consider include:

- What would I do if the wi-fi failed?
- Does my printer have enough ink and paper?
- Are there certain times of the day that your internet speeds up or slows down?
- Are your devices fully charged?
- Are there other devices you can use if the current one fails?

For technical issues that are WSU related, try getting help from <https://its.wsu.edu/csd>. I am here to answer your math questions, however I am not a technical support person.

STUDENT RESOURCES

Check these resources for assistance with technology needs such as computers or internet access:

- Financial assistance to cover technology costs, including broadband costs: <https://www.studentcare.wsu.edu/student-resources/financial-assistance/> and see link to Student Emergency Fund.
- The Chromebook loaner program will continue in fall 2021. To apply, visit: <http://itsforms.wsu.edu/Laptop/LaptopLoaner.aspx>
- Cougs Online Toolkit: <https://its.wsu.edu/cougs-online-toolkit/>
- Wi-fi access:
 - Drive-in wi-fi statewide map: <https://www.commerce.wa.gov/building-infrastructure/washington-state-drive-in-wifi-hotspots-location-finder/>
- Specialty equipment/software (e.g. drawing and annotation tablets, Adobe Creative Cloud, study rooms and pods) – available in-person in SPARK.

ACADEMIC INTEGRITY

Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) will receive a zero on the assignment or exam, and will not have the option to withdraw from the course pending an appeal, and will be reported to the Office of Student Conduct.

- Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of the definitions of cheating: <http://app.leg.wa.gov/WAC/default.aspx?cite=504-26-010>. If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding.
- No form of cheating will be tolerated in this class. If caught cheating on any assignment or test, you and any other students involved will be given a zero on the assignment or test. Depending on the severity of the incident, you may also fail the course with no option to withdraw (see above). You will be reported to the Office of Student Conduct.
- I reserve the right to request an oral examination of any student, over any item. There will be some time given to schedule the oral exam but the exact nature of the questionable item(s) will not be shared. The grade for the oral exam will replace the grade for the questionable item(s), whether it improves or lessens the existing score. Failure of the student to meet in a reasonable time will score a zero on the questionable item(s).
- All course documents are copyrighted. It is prohibited for any student to copy, distribute or put online any course materials, including but not limited to lecture notes, assignments, exams, solution keys, etc. You cannot post the homework or any course materials on a website such as Chegg.com or similar sites.
- If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at

communitystandards.wsu.edu. Make sure you submit your appeal within 21 calendar days of the faculty member's decision.

WSU SAFETY MEASURES

Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the “Alert, Assess, Act,” protocol for all types of emergencies and the “Run, Hide, Fight” response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able). Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI’s Run, Hide, Fight video and visit the WSU safety portal. Full details can be found at <https://provost.wsu.edu/classroom-safety/>

WSU REASONABLE ACCOMMODATIONS STATEMENT

Reasonable accommodations are available for students with documented disabilities or chronic medical or psychological conditions. If you have a disability and need accommodations to fully participate in this class, please visit your campus’ Access Center/Services website to follow published procedures to request accommodations. Students may also contact their campus offices to schedule an appointment with a Disability Specialist. All disability related accommodations are to be approved through the Access Center/Services on your campus. It is a university expectation that students visit with instructors (via email, Zoom, or in person) to discuss logistics within two weeks after they have officially requested their accommodations.

For more information contact a Disability Specialist :

- Pullman, WSU Global Campus, Everett, Bremerton, and Puyallup: 509-335-3417 [Access Center](https://www.accesscenter.wsu.edu) (<https://www.accesscenter.wsu.edu>) or email at access.center@wsu.edu

COVID-19 POLICY AND STATEMENT

(Academic Regulation 72): Students are responsible for ensuring that they attend all class meetings and complete all in-class and out-of-class work as assigned by the instructor. Students are also responsible for communicating with the instructor as soon as possible should they need to be absent. Students should email the instructor from their WSU email address to notify the instructor of a long-term absence.

Students are expected to abide by all current COVID-19 related university policies and public health directives, which include wearing a cloth face covering, physically distancing, self-attestations, and sanitizing common use spaces. All current COVID-19 related university policies and public health directives are located at <https://wsu.edu/covid-19>. Students who do not comply with these directives may be required to leave the classroom; in egregious or repetitive cases, students may be referred to the Center for Community Standards for university disciplinary action.

POLICY PROHIBITING DISCRIMINATION AND HARASSMENT

(Executive Policy 15): This policy expresses WSU’s commitment to maintaining an environment free from discrimination, including sexual harassment. This policy applies to all students, faculty, staff, or others having an association with the University. Discrimination, including discriminatory harassment, sexual harassment, and sexual misconduct (including stalking, intimate partner violence, and sexual

violence) is prohibited at WSU (See WSU Policy Prohibiting Discrimination and Harassment (Executive Policy 15) and WSU Standards of Conduct for Students (WAC Code 504-26)). If you feel you have experienced or have witnessed discriminatory conduct, you can contact the WSU Office of Civil Rights Compliance & Investigation (CRCI) and/or the WSU Title IX Coordinator at 509-335-8288 to discuss resources, including confidential resources, and reporting options. (Visit crci.wsu.edu for more information). Most WSU employees, including faculty, who have information regarding sexual harassment or sexual misconduct are required to report the information to CRCI or a designated Title IX Coordinator or Liaison. Visit [https://crci.wsu.edu/reporting- requirements/](https://crci.wsu.edu/reporting-requirements/) for more information.

ACCOMMODATION FOR RELIGIOUS OBSERVANCES OR ACTIVITIES

Washington State University reasonably accommodates absences allowing for students to take holidays for reasons of faith or conscience or organized activities conducted under the auspices of a religious denomination, church, or religious organization. Reasonable accommodation requires the student to coordinate with the instructor on scheduling examinations or other activities necessary for course completion. Students requesting accommodation must provide written notification within the first two weeks of the beginning of the course and include specific dates for absences. Approved accommodations for absences will not adversely impact student grades. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the period of absence. Students who feel they have been treated unfairly in terms of this accommodation may refer to Academic Regulation 104 - Academic Complaint Procedures. See also Rule 82.

SEVERE WEATHER POLICY

For severe weather alerts, see: <http://alert.wsu.edu/> and <https://oem.wsu.edu/emergency-procedures/severe-weather/>. In the event of severe weather affecting university operations, guidance will be issued through the alert system.

STUDENTS IN CRISIS – PULLMAN RESOURCES

If you or someone you know is in immediate danger, DIAL 911 FIRST!

Student Care Network: <https://studentcare.wsu.edu/>

Cougar Transit: 978 267-7233

WSU Counseling and Psychological Services (CAPS): 509 335-2159

Suicide Prevention Hotline: 800 273-8255

Crisis Text Line: Text HOME to 741741

WSU Police: 509 335-8548

Pullman Police (Non-Emergency): 509 332-2521

WSU Office of Civil Rights Compliance & Investigation: 509 335-8288

Alternatives to Violence on the Palouse: 877 334-2887

Pullman 24-Hour Crisis Line: 509 334-1133