Syllabus for MATH 2513, Discrete Mathematical Structures, Sec. 002
Spring 2019

Lectures: Tue & Thu 10:30-11:45 a.m. in 224 PHSC

Class web page: http://www2.math.ou.edu/~npetrov/math2513_s19.html

Instructor: Prof. Nikola Petrov, npetrov@ou.edu, 1101 PHSC

Office Hours: Mon 2:30–3:30, Wed 10:30–11:30 (subject to change), or by appointment, in 1101 PHSC

Teaching Assistant: Emily Cowie, lecowie@ou.edu

Description from the Course Schedule: Prerequisite: MATH 2423 or MATH 2924 or concurrent enrollment. A course for math majors or prospective math majors. Provides an introduction to discrete concepts such as finite sets and structures, and their properties and applications. Also exposes students to the basic procedures and styles of mathematical proof. Topics include basic set theory, functions, integers, symbolic logic, predicate calculus, induction, counting techniques, graphs and trees. Other topics from combinatorics, probability, relations, Boolean algebras or automata theory may be covered as time permits.

Textbook: Richard Hammack, *Book of Proof*, 3rd edition, freely available at

> https://www.people.vcu.edu/~rhammack/BookOfProof/

Grading: Your grade will be based on the following:

Homework	20 %
Quizzes	7 %
Two midterm exams	20 % each
Participation	3 %
Final exam	30 %

Course grades will be assigned by calculating the total for each student in the class, listing the totals in rank order, and assigning grades according to a reasonable total needed for each letter. After each midterm exam, I will announce tentative grades, so by the middle of the course you will have a good idea of where you stand, and what is required for a given grade.

Tentative exam dates:

Midterm Exam 1	Tuesday, February 26, in class
Midterm Exam 2	Tuesday, April 16, in class
Cumulative Final Exam	Monday, May 6, 8–10 a.m.

No books, notes, or electronic devices of any kind may be used during exams. Do not make travel plans that prevent you from taking any of the tests or the final exam at the scheduled time. If you have a legitimate reason for missing an exam that can be documented independently of your testimony (e.g., via a note or phone call from a doctor or a parent), you must contact me prior to the exam, in order to make an alternative arrangement. I am very fastidious about such matters, so don't expect such arrangements unless you have a compelling excuse that meets the above conditions (especially the "prior notice" part).

Attendance: You are expected to attend all lectures, and you are responsible for all information given out during them. You are expected to arrive on time for the lectures, properly prepared and in good physical condition – in particular, adequately rested and up to date on the course material – so that you can maintain full concentration for the entire lecture. Your attendance and active participation in all class activities will be accounted for in the Participation category.

All electronic equipment should be turned off before the start of every lecture, and should remain off until the class is dismissed. Since learning calculus requires your full attention, activities such as *conversing with*

other students, eating, sleeping, reading a newspaper, listening to headsets, using computers, cell phones, or other electronic devices, are not allowed!

Homework: The homework assignments will be given on the class web site. Your homework solutions must be turned in at the beginning of class on the due date. Giving just an answer to a problem is not worthy any credit – you have to write a complete solution which gives your step-by-step reasoning and is written in grammatically correct English. Although good exposition takes time and effort, writing your thoughts carefully will greatly increase your understanding and retention of the material. Your lowest homework grade will be dropped.

The problems in your homework should be in the order listed in the assignment, sheets should be standard-size and should be stapled. No late homework will be accepted!

You are encouraged to discuss the homework problems with other students, but you should write up the solutions in your own words. Copying solutions from a solutions manual, from someone else's work, or from the Internet is a complete waste of time, as you will not learn the material adequately, and you will pay a heavy price on the exams.

It is absolutely essential to solve problems on a regular basis. After each class, start on the problems for the topic discussed. It is much more efficient to work a few problems at a time in many sessions, rather than all at once, as this will allow your mind to assimilate the ideas better. Please read your notes from the lectures and the textbook, paying special attention to the solved examples. The assigned homework problems are a bare minimum for most students to get a basic working knowledge of the required material, so I will also assign FFT ("Food for Thought") problems – problems that you should think about, but not turn them in with the regular homework. Being able to solve the FFT problems is essential for doing well on the exams. If you need more problems to practice, note that the odd-numbered problems have answers at the end of the textbook.

In all your work, neatness and clarity count. Part of mathematics is the ability to clearly communicate your solution to others. If the reader (e.g., myself, the grader, your fellow student) cannot read or understand your solution, you will invariably lose points. You should first work out the problems on scratch paper and then write out a final solution.

Please note that generally the grader and I will not spend time assessing a writeup beyond the point of the first fatal, unfixable flaw. Once a mathematical argument has gone off the rails and it is not clear if it can be fixed, the rest of the argument written is generally irrelevant. However, if it is fixable of if there are noteworthy ideas, we may give feedback if we so choose. Generally, however, you should not assume the work you did after the fatal flaw has been assessed as either correct or incorrect.

Homework: Short in-class pop quizzes will be given at random times. Each quiz will be worth four points, of which one point is for writing your name. Your lowest quiz grade will be dropped.

There will be no make-up quizzes! If you miss several quizzes due to a legitimate reason (see above), talk to me as soon as possible.

Some important dates:

(1) First day of classes: Monday, January 14.

(2) Last day to withdraw with an automatic W: Friday, April 12 for undergraduate students, and Friday, February 22, for graduate students.

(3) Petition to the Dean to drop courses (with a grade of W or F): Monday, April 15 – Friday, May 3 for undergraduate students, and Monday, April 1 – Friday, May 3 for graduate students.

(4) Spring break (no classes): March 16–24.

(5) Last day of classes: Friday, May 3.

Policy on W/I grades: Through the end of the sixth week of the semester, students can withdraw from the course with an automatic W. Between the seventh and tenth weeks of the semester, undergraduate

students can continue to withdraw with an automatic W, but graduate students must obtain the instructor's signature on the University's "drop form" to withdraw from the course, and along with the signature the instructor must indicate whether the student is passing or failing at the time of the withdrawal. After the tenth week of the semester, all students can only withdraw via petition to the Dean of their college. The petition process also requires the instructor's signature with a passing-failing indication at the time the petition is filed. Note that a "failing" indication on the petition means that even if the petition is approved the grade in the course will be weighted in the GPA as an F.

The grade of I is not intended to serve as a benign substitute for the grade of F, and is only given if a student has completed the majority of the work in the course at a passing level (for example everything except the final exam), the course work cannot be completed because of compelling and verifiable problem beyond the student's control, and the student expresses a clear intention of making up the missed work as soon as possible. Moreover, current OU policies require that instructors and the affected students execute a written "Incomplete Contract" before a grade of I can be given. The contract makes clear: (1) what work is to be made up; (2) when the make-up work must be completed (which cannot be more than one calendar year from the assignment of the I); and (3) *what alternative grade will be assigned if the make-up work is not completed.* If the make-up work specified in the contract is not made up within one calendar year, then the alternative grade specified in the contract will be entered on the student's transcript. Thus the I grade does not became permanent on the transcript if it is not made up within one year.

Academic Misconduct: All cases of suspected academic misconduct will be reported to the Office of Academic Integrity Programs as possible violations of University's Academic Integrity Code. If the violation is confirmed by the Academic Integrity Program's Office, the penalties can be quite severe, so the best advice is **Don't do it!** For more details on the University's policies concerning academic misconduct consult the link

http://integrity.ou.edu/students.html

This link also has information about admonitions (essentially warnings about potential misconduct for fairly minor infractions) and your rights to appeal charges of academic misconduct.

Students are also bound by the provisions of the *OU Student Code*, available at

https://www.ou.edu/content/dam/studentlife/documents/AllCampusStudentCode.pdf

Students with disabilities: The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the instructor as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in Goddard Health Center, Suite 166: phone 405–325–3852 or TDD (only) 405–325–4173.

Caminante, son tus huellas	Traveler, your footsteps
el camino y nada más;	are the road and nothing more;
caminante, no hay camino,	traveler, there is no road,
se hace camino al andar.	the road is made by walking.
Al andar se hace camino,	By walking the road is made
y al volver la vista atrás	and when we turn to look back
se ve la senda que nunca	we see the path that
se ha de volver a pisar.	will never be traveled again.
Caminante, no hay camino,	Traveler, there is no road,
sino estellas sobre la mar.	only tracks of foam on the sea.

From *Proverbios y Cantares*, Antonio Machado (1875–1939)

Comment. Acad. Sc. Tom. VIII. Tab. VIII. p. 128.

Fig. 1.