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COURSE OUTLINE

MATH 428/529: Discrete Optimization

Territory Acknowledgement

We acknowledge and respect the Lekwungen peoples on whose traditional territory the university stands and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day. The First Peoples House is a social, cultural and academic centre for Indigenous students at UVic and serves as a safe and welcoming place that encourages the building of community. More information can be found at <https://www.uvic.ca/services/indigenous/house/index.php>.

Course Information

Course Title Discrete Optimization.

Course Number and Section Math 428 Section A01 (undergraduate) and Math 529 Section A02 (graduate).

Unit Value 1.5

Contact Hours 3 hours of instruction per week.

Modality Lectures take place in-person and are streamed online for remote viewing.

Course Schedule Mondays and Thursdays at 1:00pm to 2:20pm in HHB 110 and online.

Pre-requisites for Math 428 Complete one of MATH 110 or MATH 211 and one of MATH 320 or MATH 322.

Calendar Description An introduction to linear programming and combinatorial optimization, with emphasis on combinatorial optimization problems and their algorithmic solutions.

Remote Participation This course is being offered for remote participation through the PIMS Network Wide Graduate Courses program. Graduate students from outside UVic can take the course for credit through the Western Dean's Agreement (WDA) or Canadian Association for Graduate Studies (CAGS).

Instructor Information

Instructor Jon Noel

Office Hours and Location As posted on Brightspace.

Contact Available by e-mail at noelj@uvic.ca at most times of day.



Course Assessment

Your final percentage grade will be computed according to the following scheme.

Assignments (6, only 5 count)	Written Project	Final Exam
50%, equally weighted	20%	30%

Percentage scores will be converted to letter grades according to the university-wide standard table <https://www.uvic.ca/calendar/future/undergrad/index.php#/policy/S1AAgoGuV?bc=true&bcCurrent=16%20-%20Grading&bcGroup=Undergraduate%20Academic%20Regulations&bcItemType=policies>.

Course Components

Assignments There are 6 assignments due every two weeks on Mondays: Sep 22, Oct 6, Oct 20, Nov 3, Nov 17, Dec 1. Links to the assignments will be posted on the course webpage <https://extremalcombinatorics.com/optimization>. Only 5 assignments will count, each worth 10% of your final grade. Normally, a student's best 5 assignments are counted toward their grade. If a student receives a 0 on an assignment due to an academic integrity violation, then this assignment will be included among their 5 assignments which count towards their grade.

Written Project The written project involves reading about a topic in discrete optimization or its applications which is not covered in the course but is related to the topics covered in the course and writing a summary. The source material for these projects may include sections or chapters of textbooks, research papers, etc. Graduate students enrolled in Math 529, including remote graduate students, are expected to present more substantial work on their written projects.

Final Exam The final exam will be a take-home test to be completed during the UVic exam period. Further details will be made available later.

Assessment Modality The assignments and final exam can be handwritten or typeset. They must be submitted online through Crowdmark. The written project must be typeset, preferably using L^AT_EX, and e-mailed directly to the instructor.

Course Materials

Course Webpage There is a webpage for the course containing a full schedule of the lecture topics, a link to the course notes and other relevant information about the course: <https://extremalcombinatorics.com/optimization/>.

Course Notes The official course notes are available at <https://extremalcombinatorics.com/optimization/notes/>.

Brightspace There is a Brightspace page which includes a link to a Zoom meeting and a YouTube livestream that can be used to attend the lectures remotely. Please check Brightspace frequently for updates: <https://bright.uvic.ca/>.

Crowdmark Assignments and the final exam will be submitted on the Crowdmark system: <https://app.crowdmark.com/sign-in/university-of-victoria>.

Recordings Classes will be recorded and recordings will appear on Echo360 (available through Brightspace) and YouTube. Students may be audible and visible in some of the Echo360 recordings. However, an effort will be made to avoid them being audible or visible in the YouTube recordings.

Course Policies

Class expectations Students are expected to attend lectures 3 hours per week in-person or online (or watch recordings asynchronously), read the course notes, work hard on assignment problems, study for the exams, discuss the course with others and come to office hours for help if they need it. Lecture attendance is not compulsory, but it is strongly recommended.

To successfully complete the course, students should demonstrate their ability understand standard concepts, results and proof methods in discrete optimization and use their knowledge to give complete and correct solutions to problems on the assignments and final exam. They should also read the source material for their written project carefully and write a coherent, well structured and informative project.

Essential Components Students are required to complete a written project and final exam and achieve a mark of at least 35% on each of them in order to receive a passing grade. If you do not submit the written project or final exam, then you may receive a grade of 'N.'

Retroactive withdrawals are available to students who are able to provide their Associate Dean with documentation showing that accident, illness, or affliction has prevented them from making a serious attempt at the course.

Missed or Late Work Only your best 5 out of 6 assignments will be counted towards your final grade. Therefore, you may miss one assignment without any penalty. Students should not expect any concessions to be made for additional late or missing assignments. Instances of additional late or missing assignments with justification will be dealt with on a case-by-case basis. Late assignments or projects without justification will be penalized at a rate of 10% per day. Missed assignments without sufficient justification count as 0. If you do not submit the written project or final exam, then you may receive a grade of 'N.' The policies on Academic Concessions in the undergraduate/graduate policies documents attached to this course outline apply to this course.

Teaching Technology The lectures will take place in a multi-access classroom (HHB 110) equipped with ceiling mounted cameras and microphones for the purpose of streaming to Zoom and YouTube. The room also has televisions and speakers to make remote participants visible and audible. The course will be taught primarily on chalkboard.

Disclaimer on Technology Used This course makes use of the UVic-approved technologies of Zoom, Crowdmark, Brightspace, Echo360 and Outlook.

The course webpage has been registered at WHC.ca, a Canadian company, and data on the webpage is stored on servers in Canada.

Data related to the YouTube livestreams may be stored outside of Canada. The YouTube livestream has been set up in a way to minimize the possibility that students will be visible or audible in order to avoid any personal information of students appearing. Please contact the instructor if there is any information that you would like to be removed and it will be addressed as soon as possible.

Grade Questioning Adding and recording mistakes in grading can be fixed at any time. Please bring questions about marking to the attention of the instructor within seven calendar days of when the work is returned to the class. The instructor reserves the right to not reconsider the grading of term work after the seven day notice period has expired.

Collaboration Discussing exercises with classmates, including assignment problems to be submitted for credit, is a useful and mathematically healthy practice. Collaboration on solving assignment problems is encouraged. I particularly encourage you to find ways to involve remote students in your collaborations. However, any work that you submit for marks, including solutions found during collaborative work, must be written independently, in your own words, and reflect your understanding. The written project and final exams are purely individual assessments and collaboration on them is not allowed. Please review the sections on academic integrity in the undergraduate/graduate policies documents attached to this course outline.

Use of private tutors and external resources (including generative AI) Students may use private tutors or external resources to help enhance their learning. Submitting, in whole or in part, the work of another person or drawn from an external resource (including AI tools) without explicit authorization from the course instructor is plagiarism, which is a violation of the Policy on Academic Integrity. All suspected violations of academic integrity policies will be investigated.

Attachments The policies in the undergraduate/graduate policies documents attached to this course outline are deemed to be part of this course outline.

