University of Victoria Engineering

Faculty of Engineering

COURSE OUTLINE

ELEC 573 Engineering Design By Optimization II

Term – Spring 2017 (201701)

Instructor

Dr. Wu-Sheng Lu
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Office Hours

Days: Wednesdays
Time: 14:40 – 16:40
Location: EOW 427

Course Objectives

To learn fundamental theory, main stream contemporary methods and algorithms of constrained optimization. Applications of these algorithms to real-world problems in engineering and science will be an integral part of the course.

Learning Outcomes

Thorough understanding of the basic concepts and theory of constrained optimization; working knowledge of the methods and algorithms to be covered by the course.

Syllabus

Introduction and Basic Elements of Unconstrained Optimization Motivation and structure of constrained optimization problems.	3
Theory of Constrained Optimization Lagrange multipliers. First-order necessary conditions. Second-order conditions. Convexity. Duality.	8
Linear Programming General properties. Geometric interpretation of linear programs. Simplex methods. Interior-point methods. Examples and case studies.	6
Convex quadratic Programming (QP), SDP, and SOCP Active set methods. Interior-point methods. SDP algorithms. Second-order cone programming problems. Examples and case studies.	7
Concepts and Methods for General Convex Problems Subgradient and conjugate functions. L_1-L_2 minimization. Alternating direction method of multipliers.	7
Nonconvex Constrained Optimization Sequential convex programming method. Sequential QP programming. Convex-concave procedure (CCP). Examples and case studies.	7

A-Section: A01 / CRN 21215
Days: Tuesdays, Wednesdays & Fridays
Time: 1:30 – 2:20 pm
Location: DSB C126

Required Text

Title: Lecture notes to be posted.
Author: Wu-Sheng Lu

Assessment:

Assignments:	30 %	Due dates to be given in class
Project	30 %	Due on the same day as the final exam.
Final Exam	40 %	

Note:
Failure to pass the final exam will result in a failing grade for the course.

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Graduate Calendar.

http://web.uvic.ca/calendar2017-01/grad/academic-regulations/grading.html

Note to Students: Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the Chair of the Department by email or the Chair's Secretary to set up an appointment.

Accommodation of Religious Observance: http://web.uvic.ca/calendar2017-01/general/policies.html

Policy on Inclusivity and Diversity: http://web.uvic.ca/calendar2017-01/general/policies.html

Standards of Professional Behaviour: You are advised to read the Faculty of Engineering document Standards for Professional Behaviour, which contains important information regarding conduct in courses, labs, and in the general use of facilities.
http://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the entry in the current Graduate Calendar for the UVic policy on academic integrity.
http://web.uvic.ca/calendar2017-01/grad/academic-regulations/academic-integrity.html#

Equality: This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the Resource Centre for Students with a Disability located in the Campus Services Building.
The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

Course Lecture Notes
Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.