COURSE OUTLINE
ELEC 403/503 Engineering Design by Optimization
Summer 2014

Instructor
Dr. Wu-Sheng Lu
Phone: 721-8692
E-mail: wslu@ece.uvic.ca
URL: http://www.ece.uvic.ca/~wslu

Office Hours
Days: Wednesdays
Time: 14:00 – 16:00
Location: EOW 427

Lectures
Section(s):
ELEC 403: A01 (30287), A02 (30288)
ELEC 503: A01 (30324)
Days: Tuesday, Wednesday, Friday
Time: 12:30 – 13:20
Location: ECS 124

Labs
Location: ELW B326

<table>
<thead>
<tr>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>B01</td>
<td>Wednesday 15:00 – 17:50</td>
</tr>
<tr>
<td>B04</td>
<td>Wednesday 15:00 – 17:50</td>
</tr>
<tr>
<td>ELEC 403 Lab</td>
<td>starts on May 28, Wednesday</td>
</tr>
</tbody>
</table>

Required Text
Title: Practical Optimization: Algorithms and Engineering Applications
http://www.ece.uvic.ca/~optimization/
Author: A. Antoniou and W.-S. Lu
Publisher: Springer
Year: 2007

Assessment
Assignments: 10%
Labs (ELEC403) 15%
Labs & Project (ELEC503) 15%
Mid-term 20% Date: July 8, Tuesday, 12:30 – 13:20 in ECS 124
Final 55%

Note: Failure to complete all laboratory requirements will result in a grade of N being awarded for the course.

Due dates for assignments:
Assignment 1: May 14
Assignment 2: May 23
Assignment 3: May 30
Assignment 4: June 13
Assignment 5: June 24
Assignment 6: July 8
Assignment 7: July 18
The final grade obtained from the above marking scheme will be based on the following percentage-to-grade point conversion:

<table>
<thead>
<tr>
<th>Passing Grades</th>
<th>Grade Point Value</th>
<th>Percentage for Instructor Use Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>9</td>
<td>90 – 100</td>
</tr>
<tr>
<td>A</td>
<td>8</td>
<td>85 – 89</td>
</tr>
<tr>
<td>A-</td>
<td>7</td>
<td>80 – 84</td>
</tr>
<tr>
<td>B+</td>
<td>6</td>
<td>77 – 79</td>
</tr>
<tr>
<td>B</td>
<td>5</td>
<td>73 – 76</td>
</tr>
<tr>
<td>B-</td>
<td>4</td>
<td>70 – 72</td>
</tr>
<tr>
<td>C+</td>
<td>3</td>
<td>65 – 69</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>60 – 64</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>50 – 59</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Failing Grades</th>
<th>Grade Point Value</th>
<th>Percentage for Instructor Use Only</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>0</td>
<td>35 – 49</td>
<td>Fail, conditional supplemental exam. (For undergraduate courses only)</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
<td>0 – 49</td>
<td>Fail, no supplemental.</td>
</tr>
<tr>
<td>N</td>
<td>0</td>
<td>0 – 49</td>
<td>Did not write examination, Lab or otherwise complete course requirements by the end of term or session; no supplemental exam.</td>
</tr>
</tbody>
</table>

The rules for supplemental examinations are found on page 80 of the current 2013/14 Undergraduate Calendar.

<table>
<thead>
<tr>
<th>Term in which E Grade Was Obtained</th>
<th>Application Deadline for Supplemental Exam</th>
<th>Supplemental Exam Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>First term of Winter Session (Sept – Dec)</td>
<td>February 28 in the following term</td>
<td>First week of following May</td>
</tr>
<tr>
<td>Second term of Winter Session (Jan – Apr)</td>
<td>June 30 in the following term</td>
<td>First week of following September</td>
</tr>
<tr>
<td>Summer Session (May – Aug)</td>
<td>October 31 in the following term</td>
<td>First week of following January</td>
</tr>
</tbody>
</table>

Deferred exams will normally be written at the start of the student's next academic term; i.e., approximately 4 months following the deferral of the exam.

**Course Description**

1. **Course Objectives**
   
   To understand fundamental principles and basic algorithms for unconstrained optimization problems encountered in engineering analysis and designs.

2. **Learning Outcomes**
   
   Ability to analyze and formulate a typical engineering analysis/design problem as an optimization problem; and apply appropriate algorithm(s) to obtain and evaluate an optimal solution to the problem at hand.

3. **Syllabus**

   **Basic Principles**
   
One-Dimensional Optimization (Line Search) ............................................................... 7

Basic Multi-Dimensional Gradient Methods ............................................................... 7

Conjugate Direction Methods .................................................................................... 3

Quasi-Newton Methods ............................................................................................ 6

Case Studies ............................................................................................................. 6

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 ECE Chair by email or the ECE Chair's secretary to set up an appointment.

Accommodation of Religious Observance
See http://web.uvic.ca/calendar2014/GI/GUPo.html

Policy on Inclusivity and Diversity
See http://web.uvic.ca/calendar2014/GI/GUPo.html

Standards of Professional Behaviour
You are advised to read the Faculty of Engineering document Standards for Professional Behaviour at http://www.uvic.ca/engineering/current/undergrad/index.php#section0-25 which contains important information regarding conduct in courses, labs, and in the general use of facilities.

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult http://web.uvic.ca/calendar2014/FACS/UnIn/UARE/PoAcI.html for the UVic policy on academic integrity.

Plagiarism detection software may be used to aid the instructor and/or TA's in the review and grading of some or all of the work you submit.