WORKSHEET — Request for a New Course

** Place your pointer on the underlined fields and start typing to fill in text, ** or use an X or a number
to fill in "check-box" or numbered fields.

Provide information requested below that is not contained in the syllabus. Please note the
guidelines in the boxes.

Number (if known): _ENGR 160V_ _X_ Undergraduate _ ___ Graduate _ ___ Professional

Title/subtitle: _Smartphones, Tablets, and Wireless Networks: Understanding Electronics and
Information Technology_

Effective: _Fall 2015_ (Quarter and Year)

Offered: _X_ Fall _ ___ Winter _ ___ Spring _ ___ Summer _ ___ Once Only _ ___ Other _

Instructor(s): ___

Hours per week per unit of credit may not be less than but may exceed those listed below.

• One unit for each hour per week (1:1) of colloquium, consultation, discussion, lecture, seminar, or workshop

• One unit for each three hours per week (1:3) of activity, clinic, extra reading, fieldwork, individual study, internship,
laboratory, practicum, research (scheduled and outside), screening, term paper, thesis, tutorial, written work, and similar
assigned problems

• One unit for each two to three hours per week (1:2-3) of studio

Units: _4_

Activities and hours per week: Indicate below the number of hours per week that students will spend in the activities
listed (leave blank those that do not apply).

<table>
<thead>
<tr>
<th>Activity</th>
<th>Internship</th>
<th>Seminar</th>
<th>Studio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinic</td>
<td>Laboratory</td>
<td>Term Paper</td>
<td>Thesis</td>
</tr>
<tr>
<td>Colloquium</td>
<td>Practicum</td>
<td>Tutorial</td>
<td>Workshop</td>
</tr>
<tr>
<td>Consultation</td>
<td>Research (outside)</td>
<td>Written Work</td>
<td>Other:</td>
</tr>
<tr>
<td>Discussion</td>
<td>Research (scheduled)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extra Reading</td>
<td>Screening (outside)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field</td>
<td>Screening (scheduled)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Prerequisite(s): _MATH 10A; and either CS 10 (or CS 10V) or EE 20 or ME 18_
Read the guidelines in this box before writing the Catalog description.

Write the description in the present tense and limit it to 50 words (do not count grading information, repeatability information, or a list of E-Z subtitles). If possible, do not use complete sentences. However, use sentences that contain more than a list of items or topics.

Examples:
Instead of "This course will introduce students to the history of . . .," use one of the following formats:
   Introduces the history of . . .
   An introduction to the history of . . .
   Introduction to the history of . . .

Instead of "Functions, equations, and graphs," use a format similar to one of the following examples:
   Explores functions, equations, and graphs . . .
   Topics include functions, equations, and graphs . . .
   A study of functions, equations, and graphs . . .


Grading:

<table>
<thead>
<tr>
<th></th>
<th>X Letter Grade or petition for Satisfactory/No Credit (S/NC)</th>
<th>Letter Grade only</th>
<th>In Progress (IP)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>_ Letter Grade or S/NC; no petition required</td>
<td></td>
<td>S/NC only</td>
</tr>
</tbody>
</table>

The statements selected below will be added to the Catalog description by the Catalog office:

Grading statement (if required):
   _ Satisfactory (S) or No Credit (NC) grading is not available.
   _ Graded Satisfactory (S) or No Credit (NC).
   _ Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination.
   _ May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.
   _ May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.
   _ Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade.
   _ Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade.
   _ Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade.
   _ Other: ___

Repeatability statement (if required):
   _ Course is repeatable.
   _ Course is repeatable to a maximum of ___ units.
   _ Course is repeatable as content changes.
   _ Course is repeatable as content changes to a maximum of ___ units.
   _ Course is repeatable as topics change.
   _ Course is repeatable as topics change to a maximum of ___ units.
   _ Other: ___

If the course is repeatable, may a student take more than one section of the course in a single quarter? _ Yes _ No

Cross-listing statement: Cross-listed with ___

Credit statement (to limit credit when course content overlaps):

Credit is awarded for only one of ___

Other ___

Breadth statement (for CPAC, ETST, FVC, HASS, or WMST courses only): ___
Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.
Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.
Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.
See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences.
Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.
Other: __________

If the course content overlaps or duplicates the content of another course, describe the overlap or duplication: __________

If the course affects degrees, minors, and/or programs, list the affected degrees, etc. and explain how they are affected: __________

If the course affects the prerequisites and/or descriptions of other courses, list the affected courses and explain how they are affected: __________

**Justification** for establishing the course (insert or attach):

This course is needed because it will be used as part of the MSOL online degree program that the BCOE and the ECE department intend to offer. This V version of the course involves the following six components: a) a course management system, e.g., UCR's iLearn (BlackBoard) system, which UCR has been using for many years and with which most UCR faculty are already familiar; b) for online consultation with TAs and faculty, a web-based meeting system that includes shared desktop, audio, and possibly video communication. c) Remotely available online video recordings of classroom lectures (e.g., Flash 7.0+) with accompanying presentation graphics (e.g., PowerPoint slides). d) Remotely proctored exams, for which we will initially follow UCLA's policies and protocols. e) Lectures are online and would be a direct 1:1 "contact" as in a regular course. For the consultation, faculty members should be available for 1 hour/week to interact with the student via Skype (or other). f) In the evaluation, homework and other assignments are submitted via e-mail (or within iLearn). All exams are proctored. For remotely proctored exams, UCR intends to initially follow UCLA's policies and protocols.

*Syllabus* (insert or attach and include the information below): __See attached________

**Course requirements** (e.g., term papers and examinations)

If an activity selected above under "Activities and Hours" does not involve faculty contact (e.g., extra reading, individual study, and outside research), describe the activity and explain how it will be evaluated.

If one of the activities selected above is consultation hours, explain how these hours will be implemented and monitored.

For further information about course guidelines, see the General Rules and Policies Governing Courses of Instruction at senate.ucr.edu/committees/courses/guidelines.pdf
ENGR 160V  Introduction to Engineering Optimization Techniques  Syllabus

Instructor:

Dr. Hamed Mohsenian-Rad  
Assistant Professor, Department of Electrical Engineering  
Office: WCH 436  
Email: hamed@ee.ucr.edu

Course Purpose:


Number of Hours:

Three hours lecture and one hour discussion.

Textbook:


Course Topics:

- Introduction to Optimization [Chapters: 1 and 2] [Number of Hours: 3]:
  - Design Variables, Design Constraints, and Objective Function  
  - Different Classifications of Optimization Problems  
  - Single-Variable and Multi-Variable Optimization  
  - Engineering Applications of Optimization: Chemical and Mechanical Processes,  
    Circuit Design, Network Flow Problems, Supply Chain Management, etc.

  [Discussion Session: Formulating example optimization problems in engineering.]

- Linear Programming [Chapter: 3] [Number of Hours: 6]:
  - Standard form of a Linear Programming Problem  
  - Geometry of Linear Programming Problems  
  - Simplex Method  
  - Engineering Applications of Linear Programming

  [Discussion Session: Using MATLAB to Solve Linear Programming Problems]
• Nonlinear Unconstrained Optimization [Chapters: 5 and 6] [Number of Hours: 9]
  o Elimination and Interpolation Methods
  o Direct Search Methods
  o Indirect Search (Descent) Methods
  o Gradient, Steepest Descent, and Newton Methods
  o Engineering Applications of Nonlinear Unconstrained Optimization

  [Discussion Session: Using MATLAB to Solve Nonlinear Unconstrained Problems]

• Nonlinear Constrained Optimization [Chapter 7] [Number of Hours: 9]:
  o Sequential Linear Programming
  o Feasible Directions Methods
  o Penalty Functions Methods
  o Gradient Projection Methods
  o Engineering Applications of Nonlinear Constrained Optimization

  [Discussion Session: Using MATLAB to Solve Nonlinear Constrained Problems]

Prerequisites:

MATH 10A; and either CS 10 (or CS 10V) or EE 20 or ME 18

Grading (Percentage):

  Homework – 15%
  MATLAB Assignment* - 10%
  Midterm Exam: 25%
  Final Exam – 50%

* The MATLAB assignments are submitted during the discussion sessions.