**Course Outcomes** [Related ME Program Outcomes in Brackets]

1. Provide a thorough knowledge of optical phenomena and important optical devices. [A1, A2, A4]
2. Develop the ability to utilize a variety of calculation methods for optical design and analysis. [A3, A4, A5]
3. Use the acquired knowledge and calculation skill to design (synthesize) new optical systems. [A2, A3, A5]

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**Geometrical Optics** (5 wks)
1. Fundamentals
2. Imaging Systems
3. Matrix Methods
4. Aberrations
5. Fiber Optics
6. Photometry
7. System Design

**Physical Optics** (8 wks)
1. Maxwell Equations
2. Wave Propagation
3. Fresnel Equations
4. Interference
5. Diffraction
6. Polarization
7. Scattering
8. Physical optics effects on optical design

**Modern Optics** (2 wks)
1. Laser Systems
2. Holography

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**Revision Date:** 2/05/2013
1. **COURSE NUMBER AND TITLE:** ME 58700 Engineering Optics

2. **CREDITS AND CONTACT HOURS:** 3 credits
   Lecture – 3 days per week for 50 minutes for 16 weeks

3. **COURSE COORDINATOR OR INSTRUCTOR:**
   G. B. King

4. **TEXTBOOK:**
   Pedrotti, Pedrotti, and Pedrotti, *Introduction to Optics*, 3rd ed,

5. **SPECIFIC COURSE INFORMATION:**
   a. **Catalog Description:** Fundamentals of geometrical and physical optics as related to problems in engineering design and research. Characteristics of imaging systems; properties of light sources; optical properties of materials. Diffraction, interference, polarization, and scattering phenomena as related to optical measurement techniques. Introduction to lasers and holography. Typically offered in spring.
   b. **Prerequisites:** First Semester Senior Standing or Higher
   c. **Status:** Elective

6. **SPECIFIC GOALS FOR THE COURSE**

   a. **Course Outcomes:**
      [Related ME Program Outcomes in Brackets]
      1. Provide a thorough knowledge of optical phenomena and important optical devices. [A1, A2, A4]
      2. Develop the ability to utilize a variety of calculation methods for optical design and analysis. [A3, A4, A5]
      3. Use the acquired knowledge and calculation skill to design to (synthesize) new optical systems. [A2, A3, A5]

   b. **Related ME Program Outcomes:**
      [Related ABET Outcomes Listed in Brackets]
      A1. Engineering Fundamentals;   B3. Prof/Ethical Responsibility;
      A3. Experimental Skills;       B5. Life-Long Learning;
      A4. Modern Engr Tools;         C1. Leadership,
      A5. Design Skills;             C2. Global Engineering Skills;
      A6. Impact of Engr Solns;      C3. Innovation;
      B1. Communication Skills;      C4. Entrepreneurship
      B2. Teamwork Skills

7. **LIST OF TOPICS:** See following page.

PREPARED BY: G. B. King

REVISION DATE: February 5, 2013