EEL 4458 Fundamentals of Photonics

1. Catalog Description - (3 credits) Review of electromagnetic fields and waves, energy bands in semiconductors, p-n junctions and optical properties of semiconductors. Fundamentals of optical modulators and waveguides, and photonic applications.

2. Pre-requisites - EEL 3396 and EEL 3472

3. Course Objectives - The student will learn the unique aspects of the propagation of light in physical media, learn to quantify and exploit where possible the effects of dispersion and nonlinearities, particularly optical amplification, and learn how to design an electrically modulated photonic system to meet specific performance requirements with regard to signal-to-noise ratio, dynamic range, and bandwidth.

4. Contribution of course to meeting professional component (ABET only – undergraduate courses) - 1.5 credits of Engineering Design, 1.5 credits of Engineering Science

5. Relationship of course to program outcomes (ABET only – undergraduate courses) - EE2, EE3, a, c, e, i

6. Instructor - Dr. Henry Zmuda
   a. Office location - 235 Larsen
   b. Office hours - TBD
   c. Telephone - 392-09990
   d. Email address - zmuda@ece.ufl.edu
   e. Web site - www.zmuda.ece.ufl.edu/

7. Teaching Assistants - TBD
   a. Office location -
   b. Telephone -
   c. Email address -
   d. Office hours -

8. Meeting Times and Location - Mon Wed Fri 3rd period, 330 LAR

9. Class/Laboratory Schedule - 3 class periods per week consisting of 50 minutes each

10. Material and Supply Fees - None

11. Textbooks and Software Required -
    a. Title - Integrated Photonics
    b. Author - Clifford Pollock and Michal Lipson
    d. ISBN Number - 1-4020-7635-5
12. Recommended Reading - None
   a. Title -
   b. Author -
   c. Publication date and edition -
   d. ISBN Number -

13. Course Outline -
   Introduction to Photonics
   Essential of Electromagnetic Fields for Optical Systems
   Planar Waveguides
   Dispersion
   Graded Index Waveguide
   Optical Fiber
   Detection and Noise
   Semiconductor Photodectors
   Electrical Modulation of Light
   Cavities

14. Attendance and Expectations - Cell phones and other electronic devices are to be silenced. No text messaging during class or exams.

Requirements for class attendance and make-up exams, assignments, and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

15. Grading - Homework - 50%; 10 Quizzes (lowest grade is dropped) - 80%, No final exam

16. Grading Scale -

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100</td>
</tr>
<tr>
<td>A-</td>
<td>90-92</td>
</tr>
<tr>
<td>B+</td>
<td>87-89</td>
</tr>
<tr>
<td>B</td>
<td>83-86</td>
</tr>
<tr>
<td>B-</td>
<td>80-82</td>
</tr>
<tr>
<td>C+</td>
<td>77-79</td>
</tr>
<tr>
<td>C</td>
<td>73-76</td>
</tr>
<tr>
<td>C-</td>
<td>70-72</td>
</tr>
<tr>
<td>D+</td>
<td>67-69</td>
</tr>
<tr>
<td>D</td>
<td>63-66</td>
</tr>
<tr>
<td>D-</td>
<td>60-62</td>
</tr>
<tr>
<td>E</td>
<td>0-59</td>
</tr>
</tbody>
</table>

“A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C-average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

17. Make-up Exam Policy - If you have a University-approved excuse and arrange for it in advance, or in case of documented emergency, a make-up exam will be allowed and arrangements can be made for making up missed work. University attendance policies can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx
Otherwise, make-up exams will be considered only in extraordinary cases, and must be taken before the scheduled exam. The student must submit a written petition to the instructor two weeks prior to the scheduled exam and the instructor must approve the petition.

18. Honesty Policy - All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

“...failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures (http://www.dso.ufl.edu/sccr/procedures/honorcode.php)

19. Accommodations for Students with Disabilities - Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

20. UF Counseling Services - Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
- Career Resource Center, Reitz Union, 392-1601, career and job search services.

21. Software Use - All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.