1. Pre-requisites: General Physics

2. Course Objectives: Biophotonics is the science of generating and harnessing light (photons) to image, detect and manipulate biological materials. The goal of this course is to provide an introduction to the principles of optics and lasers, the basics of biology, the interaction of light with cells and tissues, and the applications of various optical imaging and sensing techniques in biomedicine. This course is highly interdisciplinary and is suitable for graduate and upper-level undergraduate students. This course is also designed to bring together students with various engineering or physics backgrounds.

3. Guest Lecturers:
   Dr. Lei Xiao (Shands Cancer Center)
   Dr. James Crawford (Department of Pathology)
   Dr. Huabei Jiang (Department of Biomedical Engineering)

4. Lab: Two lab tours (50 minutes each). One lab tour is focused on optics, and the other tour on biological sample preparation and microscopic imaging.

5. Textbooks and Software Required
   a. Title: Introduction to Biophotonics
   b. Author: Paras N Prasad
   c. Publication date and edition: May 2003
   d. ISBN number: 0-471-28770-9
   Note: Class notes will be developed mainly based on the above book.

6. Recommended Reading

7. Course Outline (provide topics covered by week or by class period)
   Week 1   Introduction; and Fundamentals Light And Matter
   Week 2   Principles of Lasers, Current Laser Technology and Nonlinear Optics
   Week 3   Light-Matter Interactions and Photobiology
   Week 4   Bioimaging: Principles of Optical Microscopy
Week 5     Basics of Biology
Week 6     Fluorescence Microscopy
Week 7     Confocal Microscopy; Diffusion Optical Tomography
Week 8     Multiphoton Microscopy; Nonlinear Optical Imaging
Week 9     Optical Coherence Tomography
Week 10    MEMS And MEMS-Based Bioimaging
Week 11    Bioimaging Applications: Cellular, Tissue and In Vivo Imaging
Week 12    Optical Sensors: Fiber-Optic Sensors and SPR Biosensors
Week 13    Laser Tweezers
Week 14    Teraherz Spectroscopy and Imaging

8. Grading
   Homework                          20%
   Lab                                5%
   Exams (2 exams, 25% each)         50%
   Project                           25%

9. 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.

10. Accommodation 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.

11. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
   - University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
   - SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
   - Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
   - Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

12. 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.