

Spring 2022

## OPSE 410-002: Biophotonics

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# Advance Optics and Biophysics Applications

Optical Science and Engineering (OPSE 410) Spring 2022  
Professor Benjamin Thomas, Department of Physics

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**Synopsis of this course:** A quantitative view of selected optical concepts of biophysics and optical instruments used for medical applications. The course will give you a chance to learn about the use of optics in biology related fields. The course is organized as a series of lectures and lab work. Extinction, optical absorption spectroscopy, differential optical absorption spectroscopy and other optical methodologies will be used to probe material related to biology.

## Text (optional):

- “Physics in Biology and Medicine,” Paul Davidovits (3rd Edition, paperback and e-book, ISBN-13: **978-0123694119**).
- “Quantitative Biomedical Optics: Theory, Methods, and Applications” Irving J. Bigio, Sergio Fantini (Cambridge Texts in Biomedical Engineering) 1st Edition

## Assessment Plan:

Final grade on the basis of the following assignments and weighting:

Lab. reports / Homework	30 %
Quiz, oral participation	10 %
Oral presentation	10 %
Common exam	20 %
Final exam	30 %

Translate % values into letter grades with the standard physics department scale as follows:

F: <40; D: 40-50; C: 50-60; C+: 60-69; B: 69-75; B+: 75-82; A: >82

**Outcomes plan:** Students will learn about:

1. the basics of optics and interactions between light and biological matter
2. How common optical instruments used in the medical field work
3. Optical methodologies to probe and study tissues

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