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Teaching wave phenomena via biophysical applications DANIEL REICH, MARK ROBBINS, ROBERT LEHENY, STEVEN WONNELL, Johns Hopkins University — Over the past several years we have developed a two-semester second-year physics course sequence for students in the biosciences, tailored in part to the needs of undergraduate biophysics majors. One semester, "Biological Physics," is based on the book of that name by P. Nelson. This talk will focus largely on the other semester, "Wave Phenomena with Biophysical Applications," where we provide a novel introduction to the physics of waves, primarily through the study of experimental probes used in the biosciences that depend on the interaction of electromagnetic radiation with matter. Topic covered include: Fourier analysis, sound and hearing, diffraction - culminating in an analysis of x-ray fiber diffraction and its use in the determination of the structure of DNA - geometrical and physical optics, the physics of modern light microscopy, NMR and MRI. Laboratory exercises tailored to this course will also be described.

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