Abstract Submitted for the NWS08 Meeting of The American Physical Society

Junior/Senior Quantum Mechanics with Lab MARK BECK, Whitman College — I describe a new curriculum for a one semester upper-level undergraduate quantum mechanics course. The course presumes a basic exposure to Schrödinger's wave mechanics at the sophomore level. The course presents matrix mechanics in a manner similar to that in the text by Townsend [1], but uses photon polarization as an initial prototypical quantum system rather than using spin-1/2 particles. This is done partly for conceptual simplicity, but it is done primarily to make a connection to the laboratory component of the course. In the lab students perform 4 experiments, all of which involve studying the quantum mechanics of individual photons. The experiments are directly related to the course material, and include a demonstration of single photon interference and a test of local realism.

[1] J. S. Townsend, A Modern Approach to Quantum Mechanics, (University Science Books, Mill Valley, CA, 2000).

Mark Beck Whitman College

Date submitted: 15 Apr 2008

Electronic form version 1.4