Title:
Lectures on "Basics on light-atom interaction, laser cooling and trapping" by Philippe W. Courteille from IFSC-USP, Brazil

Abstract:
Cold atomic clouds represent an ideal platform for studies of basic phenomena of light-matter interaction. The invention of powerful cooling and trapping techniques for atoms led to an unprecedented experimental control over all relevant degrees of freedom to a point where the interaction is dominated by weak quantum effects. This course reviews the foundations of this area of physics, emphasizing the role of light forces on atomic motion. Collective and self-organization phenomena arising from a cooperative reaction of many atoms to incident light will be discussed. The course is addressed to graduate students and requires basic knowledge of quantum mechanics and electromagnetism at the undergraduate level. It is divided into 5 lectures complemented by exercises proposed at the end of each lecture. The script of the course is available on the website http://www.ifsc.usp.br/~strontium/Publication/Scripts/LightAtomsLecture.pdf.