Review for Mid-term Exam 1:

1. The nature of electromagnetic radiation and electromagnetic spectrum.
   *Lecture 1, Eqs.[1.2]-[1.5]; Table 1.2,*

2. Main radiometric quantities: flux (or irradiance) and intensity (or radiance).
   *Lecture 1, Eqs.[1.6]-[1.10]*

3. Polarization
   *Lecture 2*

   *Lecture 2, Eqs.[2.10.1-2.12];[2.14-2.18], Lab 1*

   *Lecture 2, Eqs. [2.19-2.24], Table 2.1, Lab 1*

   *Lecture 3, Eqs. [3.5-3.8], [3.10-3.13], Lab 2*

7. Absorption spectra of radiatively active atmospheric gases.
   *Lecture 3, Lab 2*

8. The Beer-Bouguer-Lambert (extinction) law.
   *Lecture 4, Eqs.[4.1-4.4]*

   *Lecture 4, Eqs.[4.5-4.8]*

10. Molecular (Rayleigh) scattering. Rayleigh scattering phase function. Scattering cross section of air molecules and optical depth due to molecular scattering
    *Lecture 4, Eqs.[4.18-4.22], [4.26-4.27]*

    *Lecture 4, Eqs.[4.46-4.54], Lab 3*
12. Effective (total) optical properties of an atmospheric layer consisting of gas and particulates (aerosols and/or cloud particles).

   Lecture 4, Eqs. [4.55]-[4.59]

13. Remote sensing using the direct solar radiation. Retrievals of aerosol optical depth and water vapor from ground-based remote sensing (AERONET).

   Lecture 4, Eqs. [4.62]-[4.67], Lab 3


   Lectures 5, Eqs. [5.3]


   Lectures 5, Eqs. [5.9] and [5.13]


   Lecture 5, Eqs. [5.16-5.17]

17. Principles of ocean color retrievals.

   Lecture 5

18. Principles of aerosol retrievals from passive remote sensing in the visible and near-IR.

   Lecture 6, Lab 5