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PH2501 -- Photonics
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Study Guide 4

Week 4 11/12 – 11/16	Homework due 11/20 (Tues)

READINGS: Quimby, Chapters 7 and 12

Ch. 7: Here the different ways of connecting one fiber to another are considered, including the *fusion splice*, the *fiber connector*, and the *fiber coupler*. The losses associated with these can be due to lateral, longitudinal, or angular misalignments. Simple expressions are given for estimating these losses for both multimode and single-mode fiber. To diagnose fiber losses, one can utilize destructive techniques such as the *cutback method*, or non-destructive techniques such as the *optical time-domain reflectometer (OTDR)*. This latter instrument is quite versatile, and can determine the location and magnitude of a splice loss or break in the fiber, as well as the uniform loss coefficient of any particular section of a fiber.

Ch 12: Not only must light be coupled from one fiber to another, it also must be coupled from some source into a fiber. We consider this coupling problem for three types of sources: a *point source*, an *extended source* obeying *Lambert's law* for the angular distribution of emitted light, and a *laser source*. For each of these, expressions are developed for the *coupling efficiency*.

PROBLEMS: Ch. 7: problems 2, 3, 7, 9, 10, 11, 12

Ch. 12: problems 3, 4, 5, 10