ECE 520.651 Random Signal Analysis

Homework # 1

Due 9:00 AM on Tuesday, September 15, 2009.

Read pages 1-22 from Prof. Papamarcou's notes before starting this homework.

1. Problem **1.10** from Stark and Woods.
2. Problem **1.13** from Stark and Woods.
3. If a field $\mathcal{F}$ contains sets A and B, show that $\mathcal{F}$ also contains the sets $A \setminus B$ and $A \triangle B$.
4. Show that if a collection $\mathcal{F}$ of subsets of Ω is closed under complementation and *countable* unions, it is also closed under *countable* intersections.
5. Let $\mathcal{F}$ be a σ-field of subsets of Ω and fix a set $B \in \mathcal{F}$. Show that $\mathcal{G} = \{A \cap B : A \in \mathcal{F}\}$ is a σ-field of subsets of B.

   $\mathcal{G}$ is called the "*restriction of* $\mathcal{F}$ to B," or "$\mathcal{F}$ *restricted to* B."

Read Chapters **1** and **2** from Stark and Woods after finishing this homework.