

**Non-Linear PowerPoint as an aid in Learning Probability,
Random Processes, and Statistics**

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One of the challenges in learning probability, random processes, and statistics is that it can be difficult to keep track of the “big picture” when considerable attention to detail is required to learn the steps in performing the related calculations. An associated teaching challenge is to clearly present mathematical content, yet actively engage the students. Thus, while the constraints of a classroom environment (such as class size, limited time frame, etc) make it necessary to lecture, one must also find ways to make the lectures interactive. Our goal is to develop a set of interconnected non-linear PowerPoint presentations to encourage a flexible lecture style that is responsive to students’ learning needs, help students see the connections between topics, and provide a learner-driven resource for self-study and review. Our first version of the non-linear presentations was developed in spring 2005 through the support of a UT Austin Faculty And Student Teams for Technology (~FAST Tex) grant. The presentations were used for the first time in fall 2005 in BME 335, a sophomore-level biomedical engineering course on probability, random processes, and statistics, with a typical enrollment of 50-70 students. A mid-course survey indicated that 76% of the students reviewed the course notes in softcopy (*i.e.*, not print outs) “often” (46%) or “sometimes” (30%). About 58% also reviewed print outs of the notes “often” (41%) or “sometimes” (17%). By comparison, only 50% of the students reported that they read the assigned textbook “often” (17%) or “sometimes” (33%). Moreover, in reviewing the PowerPoint presentations on a computer, 50% reported that they navigated the notes using the hyperlinks “often” (30%) or “sometimes” (20%). These data provide encouraging evidence that course notes organized in a non-linear way using hyperlinks such as can be done in PowerPoint provide a valuable resource for self-study and review.