

ECE 53800 Digital Signal Processing I

Homework 1

Due Date for On-Campus Students: Turn in printout on Friday, 5 October 2018

Due Date for Off-Campus Students: Due by e-mail on Oct. 5.

Note 1: This homework is worth $15/3=5$ points of your final grade.

Note 2: The goal of this Matlab homework is to exercise you on the practical applications of discrete-time cross-correlation. An additional goal is to get you started on using Matlab.

Problem. 2.65. pp. 144-145 of the Proakis and Manolakis Textbook.

Corrections:

- (c) Plot $r_{yx}(\ell)$ NOT $r_{xy}(\ell)$.
- (e) Repeat parts (b), (c), and (d) for the signal sequence ...
- (f) Repeat parts (b), (c), and (d) for a sequence of period ...

General Information.

Deliverables for this project include 21 plots. But you are welcome to give me 27 plots. You have three different plots for each of three different PN sequences, for each of three different noise variances. So that would seem to $3 \times 3 \times 3 = 27$ plots but the sequence $x[n]$ does not change with noise variance, so there are only 21 distinct plots. BUT you are welcome to give me 27 plots.

Each plot should be clearly labeled, and should be accompanied by a brief explanation. The collection of plots and accompanying explanations should be put together in a cohesive manner in the form of a very brief report. Don't go overboard – this is simply a homework, **not** a project. Append source code to the report.

You may use any Matlab command you like in solving these problems. Each student is expected to do his/her own work and each must turn in his/her own report. Again, your write-up for this homework should be in the form of a very brief report. Handwriting is acceptable but please be sure it is legible. Your report should include:

- Answers to all questions posed including mathematical development where necessary.
- The 21 (or 27) plots and explanations.