

# EN330 – Probability and Statistics with Ocean Applications

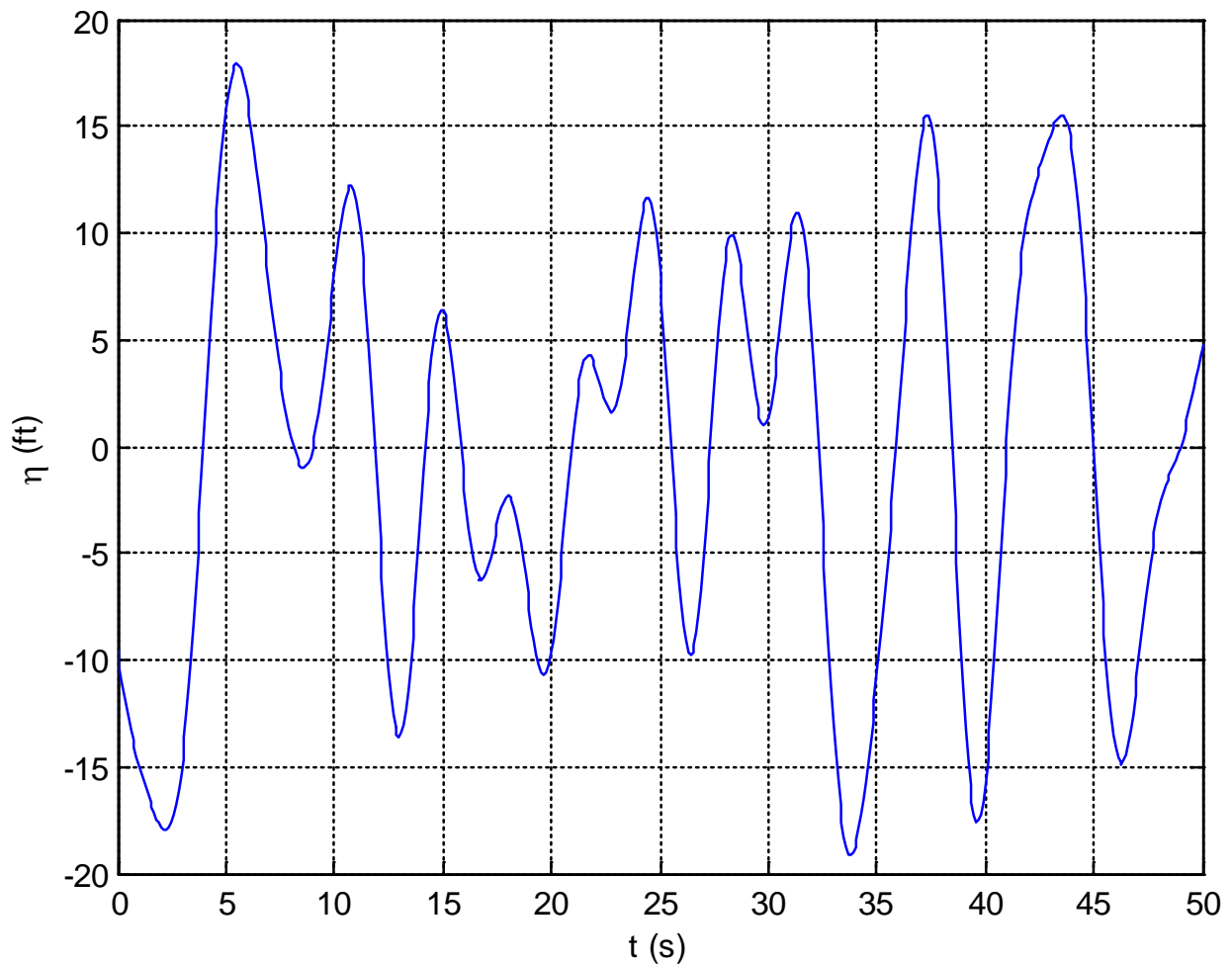
## Analysis of Random Processes

### Practice of Basic Skills

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1. Given the water surface elevation data below, find:

- $\overline{H}$
- $H_s$
- $H_{rms}$
- What is the relationship between the statistics for  $\eta$  and  $H$ ?



- What probability distribution does the water surface elevation ( $\eta$ ) follow?
- What probability distribution does wave height ( $H$ ) follow?
- If  $H_{rms} = 12$  ft, what is the probability of  $H > 24$  ft?

5. If  $\sigma = 4$  ft, what is the probability of  $-4 \text{ ft} < \eta < 4 \text{ ft}$ ?
6. Data are acquired over a period of 120 s at a sampling rate of 20 Hz.
  - a. What is the lowest frequency component that can be resolved?
  - b. What is the highest frequency component that can be resolved?
7. Given the wave energy spectrum below taken during storm conditions in the Gulf of Mexico, find:
  - a.  $m_0$
  - b.  $H_s$
  - c.  $\sigma$
  - d. What frequency and period has the largest contribution to the wave energy?
  - e. An offshore platform is placed in this area of the G of M. What deck elevation is required so that the deck is above the water surface 99.9% of the time in these conditions?

