Textbook: [C&C] A. Bruce Carlson and Paul B. Crilly, Communication Systems: An Introduction to Signals and Noise in Electrical Communication, McGraw-Hill, 2010, 5th International edition. Call No. TK5102.5 C3 2010. ISBN: 978-007-126332-0.

Topics	[C&C]
1. Introduction to communication systems	
a. Problem statement	P. 2 (second-to-last paragraph)
b. C. E. Shannon	P. 23
c. Elements of communication systems	P. 3-5
2. Frequency-Domain Analysis	
a. Sinusoids or sinusoidal waveforms	P. 29
b. Phasors	P. 29-30
c. Euler's formula	P. 29
d. Definition of Fourier transform and the corresponding inverse	P. 44-45
i. f and omega	
e. "net area" property	P. 45
f. Indicator function	
g. Sinc function	P. 37 In [C&C], normalized version is used.
h. Rectangular Pulse and Sinc	P. 45-46
i. Unit impulse or Dirac delta function	P. 68-71, 76-77
j. Conjugate symmetry	P. 45
k. Time Delay	P. 55-56
l. Frequency Translation and Modulation	P. 58-59
m. Superposition	P. 55
n. Scale Change and Reciprocal spreading	P. 46, 56
o. Duality theorem	P. 52-53
p. Convolution	P. 62-64
q. Convolution theorem	P. 65-66
r. Parseval's theorem and Energy spectral density	P. 50-52
s. Cosine pulse	P. 59-60
t. Triangular pulse	P. 61-62
u. Uncertainty principle	
v. Band-limiting and time-limiting	P. 128-129
3. Modulation and Communication Channels	
a. Definition	P. 162 (First paragraph)
b. Multiplication by cosine	P. 164
c. Message bandwidth	P. 163 [C&C] uses W instead of B.
d. Modulation Benefits and Applications	p. 8-11
i. EM spectrum	
ii. Unlicensed bands	
iii. Atmospheric absorption	
iv. National radio quiet zone and the electrosensitives	
e. Impulse response, transfer function	P. 94, 96-98
f. Distortionless Transmission	P. 105
g. Signal distortion in transmission	P. 106-109

h. Memoryless nonlinear distortion	P. 114
i. Multipath distortion	Last paragraph on P 13 Figure 1.3-2 on P 14 Example 3.2-2 P 113
4. Amplitude/Linear Modulation	P. 162 Second part of Section 4.2
a. DSB-SC modulation	
i. Synchronous Detection by the product demodulator	First paragraph on p 195
b. Fourier series	In [C&C], the graphical representation is primarily done by using 1) one-sided or positive-freq. line spectra and 2) two-sided line spectra where the coefficients of the Fourier series are used directly as height of the lines. However, for us, we use the delta function to unify all the representation using Fourier transform.
i. Exponential Fourier series	P 35-36
ii. Fourier transform of periodic signal based on the coefficients in Fourier series	P. 72
iii. Parseval's Power Theorem	P 42
c. Classical DSB-SC Modulators	
i. Square Modulator	P. 180-181
d. Energy and Power	
i. Normalized signal energy	P. 43
ii. Rayleigh's Energy Theorem and the inner-product version	P. 50-52
iii. Time average	P. 34
iv. Inner-product	
v. Normalized power	P. 34 (no "d" though)
vi. Power of phasor	P. 42
vii. Power of sinusoid	P. 34
viii. Parseval's power theorem	P. 42 (as super position of average power)
ix. Power signal	P. 34
x. Energy Signal	P. 44
e. Instantaneous frequency	P. 208-209