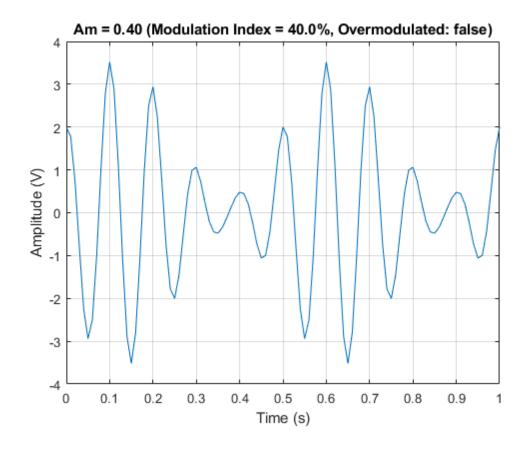
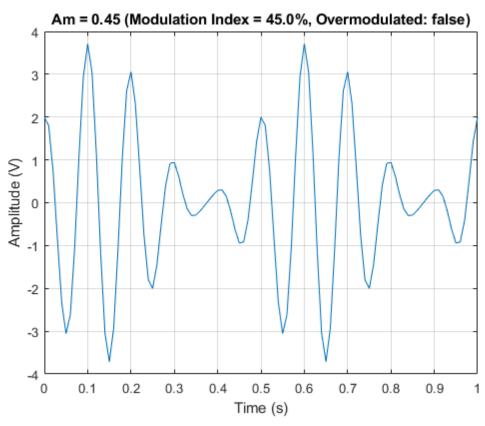
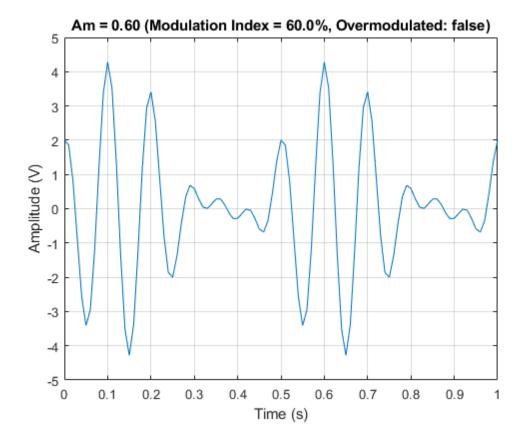
```
clc; clear; close all;
fc = 10;
                % Carrier frequency (Hz)
Ac = 2;
               % Carrier amplitude (V)
fm = 2;
           % Modulating frequency (Hz)
mu_sens = 2;  % Amplitude sensitivity (V/V)
fs = 100;
              % Sampling frequency (Hz)
            % Sampling time
% Number of samples
ts = 1/fs;
n = 2000;
t = (0:n-1)*ts; % Time vector
Am values = [0.4, 0.45, 0.6];
for i = 1:length(Am_values)
   Am = Am_values(i);
   % Modulation index calculation
    beta = mu_sens * Am / Ac * 100;
    is_overmodulated = beta > 100;
    m_t = Am * sin(2*pi*fm*t);
   % AM signal
    s_t = Ac * (1 + mu_sens * m_t) .* cos(2*pi*fc*t);
    figure;
    plot(t, s_t);
   title(sprintf('Am = %.2f (Modulation Index = %.1f%%, Overmodulated: %s)', ...
        Am, beta, string(is_overmodulated)));
    xlabel('Time (s)');
    ylabel('Amplitude (V)');
    xlim([0 1]);
    grid on;
end
```







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