

# Çankaya University – ECE Department – ECE 376

2013 Spring Term

February 2013

**Experiment 2 : FM – PM Modulation**

**Experiment coded in MATLAB is given on the course webpage [ece373.cankaya.edu.tr](http://ece373.cankaya.edu.tr).**

1. Copy the experiment file into the directory of your name.
2. Run the file, observe the OPs, do not record anything yet. Try to follow what is intended and what is happening
3. Write a comment against each line in the form of % ..(Your Comment). Add lines if necessary.
4. Record in your lab notebook the different stages of the experiment, also drawing the different OPs, i.e. time waveforms, frequency spectrums etc. Label each OP with a title and along the axes. Include comments underneath each graph. Also show the overall operation in terms of block diagrams.
5. Explain why the FM waveform of  $m_1(t)$  and PM waveform of  $m_2(t)$  are the same.
6. Observe the FM spectrum for a sinusoidal modulating signal. Compare the spectral components against the values of Bessel Functions to be calculated using Matlab function `besselj(n,  $\beta_f$ )`, where  $\beta_f$  is the modulation index, whose definition is given on line 46 of the m file. Try to explain the difference if any. For this calculation, benefit from the lecture notes entitled, “ECE 376 AM\_FM\_Demodulation\_Jan\_2013\_HTE”.
7. Record the final version of the experiment file in your directory and on your diskette. Get a printout of the final version and paste it on a blank sheet of your experiment notebook.
8. Include your general comments