Assignment 1: A Simple Data Link Layer Protocol

Use the RS232 (or Wi-Fi, or Socket) to setup a simple link layer protocol between two computers. The protocol fulfills the following tasks:

1. Read the small jpeg file umdlogo.jpeg or other files in a binary format using the transmitter computer.
2. Pack the bit stream of the file into many I-frames with sizes of 1024bit (or in other sizes) payload.
3. Each frame contains a header of *01111110*.
4. Each frame has a frame counter (1Byte).
5. Each frame attach with a CRC check by using a divisor *110101*.
6. At the receiver computer, realize frame synchronization (find the header) and CRC check.
7. Use stop and wait automatic repeat request (ARQ) for error control.
8. Use the timer to control the ARQ.
9. The ACK is without CRC and instead use a simple repeat diversity by extending to 1 Byte.
10. Write the receiver bit stream to a file in binary format and show it.
11. Generate random errors during the propagation and use it to validate the CRC functionality.
12. Demonstrate your project in lecture.

Other suggestions
1. Use the data rate greater than 19.2Kbps to save the transmission time.
2. Use a build-in test frame to realize the function before actually transfer the jpeg file.
3. Be sure to use a *null modem cable* to connect two computers
4. Working in groups or individually is both accepted. However, no more than two students are within one group.