EE696: 5G Wireless Standards Design **EE Dept. IITK**

MATLAB Assignment-2

5G Transceiver Implementation -I *May. 2023*

You have to implement the following in MATLAB. We will provide the MATLAB codes for LDPC encoder and decoder.

1. Transmit chain which will
   - Generate a transport block (TB) of size 20496 and append TB-CRC
   - Segment the TB and calculate and append the CB-CRC (implement the segmentation from the standard)
   - LDPC encoding for all the segmented code blocks
2. Receive chain which will
   - Perform LDPC decoding for each segmented code block
   - Validate and remove the CB-CRC for each code block
   - Concatenate the segemented decoder code blocks
   - Show that the transmit and receive code block match

Regarding the MATLAB code:

- File LDPC_test.m is the main file which calls both LDPC encoder and decoder functions. This file also does BPSK modulation and demodulation which are required for the LDPC decoder to work.
- Executing this file should show you "errors= 1×0 empty double column vector" message. It implies that LDPC decoder is decoding data correctly and there are 0 errors.

You are all set. Happy coding.

Please follow these Coding instructions:

- Properly comment your code.
- The code should execute and generate the desired output.
- Your submission should be self-contained (should include all the files required for running it).
- Avoid hard-coding the values of the variables for specific configurations. The code should be generic.

Please follow these submission instructions.

- Deadline is 4th of June, 11:59 pm.

- All codes should be in one .zip/.rar folder. Please do not submit separate files.
- Upload your properly commented in the portal. Name your code as rollno.zip.
- Please submit one final zip file.
- Please do not mail your file to me.

Please also read this carefully.

- Each one of you have to individually do all the reading and MATLAB assignments. You can discuss with your friends but you will have to completely write your own code.