**CMPE 443 PRINCIPLES OF EMBEDDED SYSTEMS DESIGN**

**PRELAB #010 “UART”**

1. **Problem Definition**

In this prelab, you will use a potentiometer and serial communication. You can use your PRELAB9 code for getting the ADC values. You will send the ADC values to the PC (with the “\r\n“) at every 500ms. You will use interrupt for UART.

You can use various programs for showing the serial communication output. You can use Putty or a different alternative which is suitable for your OS.

<https://www.cyberciti.biz/hardware/5-linux-unix-commands-for-connecting-to-the-serial-console/>

Serial Communication configuration:

* 9600 Baud
* 8 Data Bits
* 1 Bit Stop
* No Parity

1. **UART**

* Which UART is connected to STM32 USB Virtual COM Port (VCP)? LPUART1
* Which pins are TX/RX?

TX: PG7 RX: PG8

* Enable Clock for Power Interface

RCC\_APB1ENR1 |= 1 << 28;

* Change the regulator mode to Low-power mode

PWR->CR1 |= 1 << 14;

* Make VDDIO2 valid

PWR->CR2 |= 1 << 9;

* Change the clock source of Low-power UART to SYSCLK

RCC\_CCIPR1 |= 1 << 10;

* Enable Clock for Low-power UART RCC\_APB1ENR2 |= 1;
* Enable Clock for GPIO RCC\_AHB2ENR |= 1 << 6;
* Change the functionality of the pin

GPIOG->MODER &= ~(1 << 14);

GPIOG->AFRL |= 0b1000 << 28;

* Change LPUART baud rate (BRR) for 9600 Baud rate

LPUART1->BRR = 0x1A0AA; // 4Mhz \* 256 / x = 9600

* Enable FIFO mode for UART LPUART1->CR1 |= 1 << 29;
* Enable Transmitter and Receiver for UART

LPUART1->CR1 |= 1 << 3; // TE

LPUART1->CR1 |= 1 << 2; // RE

* Enable Interrupt and LPUART

LPUART1->CR1 |= 1 << 5; // RXFNEIE: RXFIFO not empty interrupt enable

LPUART1->CR1 |= 1 << 7; // TXFNFIE: TXFIFO not full interrupt enable

NVIC\_ISER->ISER2 |= 1 << 2;

LPUART1->CR1 |= 1; // UE: LPUART enable

1. **Code**

In this prelab, you need to write code as described at the problem definition.

1. **Submission**

You will submit one zip file which contains this document and your project (all the files with the last configuration)

The naming of the zip file should be:

PRELAB<exp num>\_<StudentID>.zip

1. **Related Videos and Links**

UART:

<https://www.youtube.com/watch?v=EqMF-aEyLgQ>