Date- 14/02/2025   *Duration: 3 hours*

Activity 01: Generate EPWM1 with 50KHz frequency and use ADC to vary PWM duty ratio (use voltage divider and 3.3 volt on launchpad) and run the buck converter.

Activity 02 - Generate EPWM2 with 50 KHz where EPWM2 is in sync with EPWM1 (EPWM2-Slave and EPWM1-Master). Use EPWM2 to generate SOC for ADC. Adjust sampling instance such that you can sample the average value (i.e. middle of the rising edge or falling edge of inductor current when running buck converter) Verify by viewing EPWM in oscilloscope.

Activity 03 – Include the discretised PI controller code, use saturator to limit the output of PI controller between 0.2 & 0.8. Run the buck converter.

Activity 04- Run the buck at fixed duty ratio (0.5). Measure output voltage. Now in close loop code, give this V_{out} as reference & make the saturation limits close to the fixed duty i.e. if duty is 0.5 limits are (0.45, 0.55). Tune K_p and K_i such that duty ratio settles at 0.5.

Activity 05 – Adjust the sensor gain, K_p, K_i values and perform average current control of buck converter.