Semester	VI	Course Title	Advanced Communication and Embedded System Lab	Course Code	18ECL67
Teaching Period	50 Hours	L – T – P -TL*	0– 0 – 3– 3	Credits	2
CIE*	40 Marks	SEE*	60 Marks	Total	100 Marks

CREDITS- 02

Course Objectives:

- Understand the design, application and practical implementation of various Digital Modulation techniques
- Understand the challenges in practical implementation of Microwave Communication Systems
- Understand the ARM Cortex M3 instruction set and learn programming for various applications in Assembly and C language.
- Program ARM Cortex M3 using software tool to interface I/O with external devices for embedded system applications.

PART-A

1.Time Division Multiplexing and De multiplexing of two band limited signals

2.Amplitude Shift Keying Modulation and Demodulation

3.Frequency shift keying Modulation and Demodulation

4.Phase Shift Keying Modulation and Demodulation

5.Differential Phase Shift Keying Modulation and Demodulation

6.Quadrature Phase Shift Keying Modulation and Demodulation

7.Measurement of frequency and power in a microwave test bench using Klystrone

8.Study of Propagation loss, Bending loss and Measurement of Numerical Aperture in OFC

9.Determination of coupling and isolation characteristics of a microstrip directional coupler

10.(a) Measurement of resonance characteristics of a microstrip ring resonator and determination of dielectric constant of the substrate.

(b) Measurement of power division characteristics of a microstrip 3 dB power divider.

11.Study Of Dipole Antenna Radiation Pattern (Simple Dipole and Folded Dipole antenna)

12.To find the Gain and Directivity of Yagi-Uda Antenna, Dipole antenna and Patch antenna

Part-B
EMBEDDED SYSTEM LAB
Laboratory Experiments:
Note: Conduct the following experiments on an ARM CORTEX M3 evaluation board to learn Assembly and C language programming using evaluation version of Embedded 'C' & Keil uvision-5 tool/compiler.
1. Programming
1. To multiply two 16 bit binary numbers.
2. To find the sum of first 10 integer numbers.
3. To find the number of 0's and 1's in a 32 bit data.
4. To determine whether the given number is even or odd
5. To write data to RAM
2. INTERFACE
6. Interface a LED, Relay and Buzzer using switches.
7. Display the Hex digits 0 to F on a 7-segment LED interface, with an appropriate delay.
8. Interface and Control the speed of a DC motor.
9. Interface a Stepper motor and rotate it in clockwise and anti-clockwise direction.
10. Interface a DAC and generate Triangular and Square waveforms.
11. Display "Hello world" message using internal UART.
12. Demonstrate the use of an external interrupt to toggle an LED ON / OFF.
13. Interface a 4x4 keyboard and display the key code on 7-segment LED interface / LCD.
14. Interface a SPI ADC IC to convert the analog input signal to digital output signal.
Course Outcomes: • Measure the parameters of microstrip devices-directional coupler, microstrip ring resonator and power divider. • Construct the experimental setup to find out propagation loss, bending loss and numerical aperture • Demonstrate the of types of digital signals ASK,PSK and FSK signals • Understand the 16bit/32bit instruction set of ARM Cortex M3 and write the assembly and C language program using software tool for various applications. • Develop ARM Cortex M3 programs and its library functions using software tool to interface I/O with external devices for embedded system applications.