SHRI VENKATESHWARA UNIVERSITY

Syllabus

DIPLOMA

(Electronic & Communication Engineering)
V SEMESTER
(Three Years Programme)

(w.e.f. 2019-20)

SCHOOL OF ENGINEERING & TECHNOLOGY

SEMESTER- V

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	PEC -501	Embedded Systems	3	0	0	20	10	30		70		100	3
2	PEC-502	Mobile and Wireless Communication	3	0	0	20	10	30		70		100	3
3	PEC-503	Control System and PLC	2	0	0	20	10	30		70		100	2
4	PEC-504	Microwave and RADAR	3	0	0	20	10	30		70		100	3
5	PEC - 505	Electric circuits and network	2	1	0	20	10	30		70		100	3
6	PEC -511	Embedded Systems Lab	0	0	2				10		15	25	1
7	PEC-512	Mobile and Wireless Communication Lab	0	0	2				10		15	25	1
8	PEC-513	Control System and PLC Lab	0	0	2				10		15	25	1
9	PEC-514	Microwave and RADAR Lab	0	0	2				10		15	25	1
10	PEC -515	Summer Internship-II	0	0	0				50			50	3
11	PEC-516	Project Phase -I	0	0	4				50		50	100	2
												750	22

Summer Internship-II (6weeks) after IVth Sem

Course Code	:		*PEC-501*
Course Title	:		Embedded Systems
Number of Credits	:		3 (L: 3, T: 0, P: 0)
Prerequisites	:		NIL
Course Category	:		PC

Course Content:

Unit I -Embedded C basics operators for Arduino

Familiarizing with the Arduino IDE.

Sketch designing for Arduino

Communication interface using serial port

Basic understanding of the code with boolean operations, pointer access operations, bitwise operations, compounded operations.

Unit II - Embedded C control structure blocks

Looping mechanism – for, do and while.

The branching operations based on conditions expression

Unit III Introduction to Arduino Mega

Arduino Mega specifications including power ratings, digital and analog peripherals.

Difference between the C language and Embedded C language

Arduino Mega Ports, Pins, Digital and Analog Peripherals

Unit IV Communication with Arduino

Different communication modules available with their real-life application

Communication interface

SUGGESTED LEARNING RESOURCES:

S. No.	Title of Book	Author	Publication
1.	Arduino Projects For Dummies (For Dummies Series)	Kennedy George; Davis Bernard; Prasanna SRM	Wiley (5 July 2013) ISBN : 978-1118551479
2.	Make: Getting Started With Arduino - The Open Source Electronics Prototyping Platform	Massimo Banzi and Michael Shiloh	Shroff/Maker Media; Third edition (27 December 2014) ISBN : 978-9351109075

SUGGESTED SOFTWARE/LEARNING WEBSITES:

a. https://www.arduino.cc/reference/en/

b. https://learn.adafruit.com/category/learn-arduino

Course code		PEC-502
Course Title	:	Mobile and Wireless Communication
Number of Credits	:	3 (L: 3, T: 0 P: 0)
Prerequisites	:	NIL
Course Category	:	PC

Course Content:

Unit I - Overview of Cellular Systems

   Evolution 2g/3G/4G/5G

   Cellular Concepts – Frequency reuse, Cochannel and Adjacent channel Interference

Unit II - Wireless propagation

   Link budget, Free-space path loss, Noise figure of receiver

   Multipath fading, Shadowing, Fading margin, Shadowing margin

Unit III Antenna diversity, wireless channel capacity and MIMO

Unit IV Overview of CDMA , OFDM and LTE

SUGGESTED LEARNING RESOURCES:

S. No.	Title of Book	Author	Publication
1	Wireless Communications – Principles and Practice	T. S. Rappaport,	(2nd edition) Pearson ISBN 9788131731864
2	Modern Wireless Communications	Haykin & Moher	Pearson 2011 (Indian Edition) ISBN : 978-8131704431

Course Code	:	PEC-511
Course Title	:	Embedded Systems Lab
Number of Credits	:	1 (L: 0, T: 0 P: 2)
Prerequisites	:	NIL
Course Category	:	PC

Course Content:

SUGGESTED PRACTICALS/ EXERCISES

The practical in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency.

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
1.	Built-in LED state control by push button sketch implementation	I	02*
2.	Built-in LED blinking sketch implementation	I	02
3.	Built-in LED blinking by toggling states based on binary operation	I	02
4.	Built-in LED state control by user interface through serial port	I	02*
5.	User interface for boolean operation and bit wise operation through serial port	I	02
6.	User interface for compounded operation through serial port	I	02
7.	Looping mechanism to check the state of pin and if change print its status on serial port	II	02
8.	Controlling multiple LEDs with a loop and an array	II	02
9.	Use a potentiometer to control the blinking of an LED	III	02*
10.	Uses an analog output (PWM pin) to fade an LED.	III	02
11.	Servo Motor Control using PWM	III	02
12.	Temperature sensor interfacing and sending its reading over serial port	IV	04
13.	I2C light sensor interfacing and sending its reading over serial port	IV	04*
	Total		30

SUGGESTED LEARNING RESOURCES:

S. No.	Title of Book	Author	Publication
1.	Arduino Projects For Dummies (For Dummies Series)	Kennedy George; Davis Bernard; Prasanna SRM	Wiley (5 July 2013) ISBN : 978-1118551479
2.	Make: Getting Started With Arduino - The Open Source Electronics Prototyping Platform	Massimo Banzi and Michael Shiloh	Shroff/Maker Media; Third edition (27 December 2014) ISBN : 978-9351109075

SUGGESTED SOFTWARE/LEARNING WEBSITES:

c. https://www.arduino.cc/reference/en/

d. https://learn.adafruit.com/category/learn-arduino

Course Code	:	**PEC-512**
Course Title	:	Mobile and Wireless Communication Lab
Number of Credits	:	1 (L: 0, T: 0, P: 2)
Prerequisites	:	NIL
Course Category	:	PC

Course Content:

SUGGESTED PRACTICALS/ EXERCISES

The practical in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency.

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
1.	To understand the cellular frequency reuse concept to find the co-channel cells for a particular cell.	I	04
2.	To understand the path loss	II	04
3.	Understand the path loss with shadowing	II	04

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
4.	Understanding the Flat fading	II	04
5.	Understanding the Frequency selective fading	II	04

6.	Understanding the Multipath channel for the following objectives
	   1. No Fading
	   2. Flat Fading
	   3. Dispersive Fading
		II	04

7.	To simulate a dipole antenna (λ, $\lambda/4$, $\lambda/2$, $3\lambda/2$) for a particular frequency using 4NEC2	III	04

8.	Perform following experiments using CDMA trainer kit
	   1. PSK modulation and demodulation experiment
	   2. Bit synchronization extraction experiment
	   3. Error correction encoding experiment
		IV	04

	Total		**32**

REFERENCES/SUGGESTED LEARNING RESOURCES:

S. No.	Title of Book	Author	Publication
1	Wireless Communications – Principles and Practice	T. S. Rappaport,	(2nd edition) Pearson ISBN 9788131731864
2	Modern Wireless Communications	Haykin & Moher	Pearson 2011 (Indian Edition) ISBN : 978-8131704431