IV SE	POOJYA DODDAAPPA APPA COLLEGE OF ENGINEERING, KALABURAGI B.E. in Electronics &Instrumentation Engineering Scheme of Teaching and Examination 2021-2022 Outcome Based Education (OBE) and Choice Based Credit System(CBCS) (Effective from the academic year 2021-2022) V SEMESTER (ELECTRONICS AND INSTRUMENTATION ENGINEERING)												
Sl.	Course	and Course	Course Title		Teachi	ing Ho	ours/We	ek		Exami	nation		
No Code		Code		Teaching Department	Theory/ lecture	Tutorial	Practical/ Drawing	Self-study	Duration in Hours	SEE Marks	CIE Marks	Total Marks	Credits
					L	Т	Р	S					
1	PC	21EI41	Process Measurement Techniques and Instrumentation	EIE	3	0	0	0	3	50	50	100	3
2	PC	21EI42	Signal Conditioning Circuits	EIE	3	0	0	0	3	50	50	100	3
3	PC	21EI43	Network Analysis	EIE	3	0	0	0	3	50	50	100	3
4	PC	21EI44	Microcontroller and Embedded Systems	EIE	3	0	0	0	3	50	50	100	3
5	HSMS	21KAK45 21KAN45	Samskrutika Kannada Balake kannada	HU	2	0	0	0	1.5	50	50	100	1
6	AEC	21EIAE46A	Organic Farming: Horticulture	EIE	2	0	0	0	2	50	50	100	2
7	AEC	21EIAE46B	Signal Conditioning Lab Using Multi SIM	EIE	0	0	2	0	3	50	50	100	1
8	UHV	21UHV46C	Universal Human Value-II	EIE	2	0	0	0	2	50	50	100	1
9	PC	21EIL41	Signal Conditioning Circuits Lab	EIE	0	0	2	0	3	50	50	100	1
10	PC	21EIL42	Microcontroller Lab	EIE	0	0	2	0	3	50	50	100	1
11	PC	21EIL43	Verilog Lab	EIE	0	0	2	0	3	50	50	100	1
			То	tal						550	550	1100	20

Course Title: 1	Course Title: Process Measurement Techniques And Instrumentation						
Course Code	21EI41	CIE: 50					
Number of Lecture Hours/Week	03 Hrs.(Theory)	SEE: 50					
Total Number of Lecture Hours :42	Credits: 03	SEE Hours: 03					
Prerequisite: Transducers	and Instrumentation						
 Course Objectives 1.To enable the studen implement those to me 2.To impart knowledge level, flow. 3.To enable the studen implement in head flo 4.To make the students techniques. 	nts to know various temperature measuring devices easure that parameter. about various instruments for measuring different par ts to understand the concepts of Bernoulli's theorem ow meters. understand various concepts of temperature and pressu	and how to rameters like and how to re measuring					
1	Teaching Hours						
Pressure Measurement sensing elements; Burdo Measurement of pressure transducer. Inductive transducer; LV Dynamic response of pro- Gauge.	Module IPressure Measurement: Introduction. Manometers, problems. pressure sensing elements; Burdon tube, bellows, diaphragms, problems, and capsules. Measurement of pressure by potentiometer transducer, strain gauge transducer.10 HrsInductive transducer; LVDT. capacitive transducer. Dynamic response of process measuring system. Bridgman Gauge, McLeod						
	Module II						
Module II Temperature Measurement: Introduction, classification of temperature measuring Devices, Electrical methods of temperature measurement RTD- Introduction, materials used, constructional details, linear approximations, quadratic approximations, measurement of resistance of thermometers, salient features of RTDs. Thermistor- introduction, construction, characteristics, applications of thermistors. Thermocouples; principle, construction, characteristics, measurement of output of thermo couple, series and parallel connection, compensation techniques- reference junction, lead wire. Installation of thermocouple. problems associated with thermocouples.							
Level measurement: It liquid level measurement pressure transducer, buo Liquid level measurement	Module III ntroduction, classification of liquid level detectors, ent using force transducer, mercury manometer, yancy method. ent by resistive, inductive and capacitive methods,	08 Hrs					

Liquid level by ultra	sonic method, float level differential pressure method.							
	Module IV							
Flow measurement techniques. Flow venturimeter, orific Electromagnetic flo Anemometer.	ht: Introduction, flow characteristics. flow measuring measurement methods; variable head flow meters- ce plate, flow nozzle, pitot tube. rotameters. ow meters, Turbine flow meter, Anemometers, Laser	08 Hrs						
	Module V							
Hotwire anemometer, hot film transducer, vortex meter, ultrasonic flow meter, Nutating disk meter, rotary vane meter, lobed impeller flow meter, flow visualization methods. Measurement of liquid level by ultrasonic method.								
Question paper pat	ttern:							
Total ten questions	Total ten guestions will be asked. Two from each module. The student has to answer five							
questions, selecting	at least one from each module.							
Text books:	Text books:							
1. Mechanical measu	1. Mechanical measurement & instrumentation-A.K. Sawhney.							
Reference Books:`								
1. Measurement syst	tems- E.O.Doeblin.							
2. Instrumentation D	Devices & System-Rangan, Mani & Sharma.							
Course outcomes:								
On completion of the	he course, the student will have the ability to:							
Course CO # C	Course Outcome (CO)							
Code 21EI41 CO1	values the energy of various areas and and	nothoda ard						
$\begin{bmatrix} 21 \text{L}141 \\ 3 \end{bmatrix} \begin{bmatrix} \text{COI} \\ 3 \end{bmatrix} \begin{bmatrix} \text{E}_{1} \\ 3 \end{bmatrix}$	ifferent transducers	nemous and						
	Associate different temperature measuring devices							
	escribe unterent temperature measuring devices.							
CO3 D	Describe the various techniques for level measurement.							
CO4 D	Demonstrate the knowledge of various techniques for flow me	easurement.						
CO5 E. m	explain the operation of various pressure and strain methods.	neasurement						

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3											3	1	
CO2	3	2	2										3	1	
CO3	2	1	2										2	1	
CO4	2	2	1										2	1	
CO5	2	1	1										2	1	

Course Title: Signal Conditioning Circuits								
Course Code	21EI42	CIE: 50						
Number of	03 Hrs.(Theory)	SEE: 50						
Lecture Hours/Week		~						
Total Number of Lecture	Credits: 03	SEE						
Hours : 42		Hours: 03						
Prerequisite: Basic Electronics.								
Course Objectives								
This course will enable the stude	ents to							
• Define and describe Op Amp,	basic concepts, characteristics and specifications							
• Gain knowledge about Linear	and nonlinear applications of Op-amp.							
• Design and develop circuits lik	te, amplifiers, filters, Timers to meet industrial requirements.							
• Get a firm grasp of basic princ	iples of op-amp							
Modules								
Module I								
Introduction to Operational Amplifiers: Introduction, Block schematic of an Op-amp, Power								
supply connections, Characteris	tics of an Ideal OP-AMP, Inverting Amplifier, Non-inverting							
Amplifier, Voltage follower, Di	fferential Amplifier, CMRR. (Relevant problems).							
Operational Amplifier Charact	eristics: DC characteristics – Input bias current, Input offset							
Erroquoney response. Slow rate	Dial output offset voltage, Thermal drift. AC characteristics –	09 Uma						
Basic On-amp applications: Sec	r SAA. ale changer/Inverter Summing amplifier: Inverting summing	00 1115						
amplifier. Non-inverting Summ	ing amplifier. Subtractor, Instrumentation Amplifier.							
	Module II							
Operational Amplifier Applicat	ions: $V - I$ and $I - V$ converter, Op-amp circuit using diodes,							
sample and hold circuit, Differe	ntiator and Integrator.							
Comparator and waveforms	generator: Comparator, Regenerative comparator (Schmitt	08 Hrs						
Trigger), Astable mutivibrate	or, Monostable multivibrator and Triangular waveform							
generator. Phase shift oscillator,	Wien bridge oscillator. (Relevant problems).							
	Module III							
Voltage Regulators: Introducti	on, Series Op-amp regulator, IC voltage regulators, 723							
general purpose regulators, switching regulator.								
Active inters. First and Second order LPF, First and Second orders HPF, Band Pass Filters, Band Reject filters. (Design examples)								
Band Reject Inters. (Design exa	mpies) Modulo IV							
555 Timer: Description of Functional Diagram Monostable operation Applications of								
Monostable Multivibrator: Frequency Divider. Astable operation. Applications of Astable								
Multivibrator: Phase Locked L	oops: Basic Principles, Analog phase Detector/comparator,							
Voltage controlled oscillator,	PLL applications: Frequency Multiplication/Division, FM	08 Hrs						
demodulation.								

Data Acquisi	tion Syste	ems: Types of instrumentation systems. Components of analog data								
acquisition sy	tion syste									
acquisition system, Digital data acquisition system.										
Deta Convert	stelli, Dig	that uata acquisition system.								
Data Convert	lers: Digit	at to Analog Converters: Basic DAC techniques, weighted Resistor								
DAC, $\mathbf{K} = 2\mathbf{K}$		DAC, DAC 0800 (Data sneet: Features and description only).	10 11							
Analog to Di	gital Con	verters: Functional diagram of ADC, Flash ADC, Counter type ADC,	10 Hrs							
Successive approximation ADC, Dual slope ADC. ADC 0809 (Data sheet: Features,										
specifications	specifications and description only), DAC/ADC specifications.									
Question pap	per patter	m:								
Total ten que	estions wi	ill be asked. Two from each module. The student has to answer five	e questions,							
selecting at le	east one fr	om each module.								
Text Books										
1. "Linear Int	tegrated C	Circuits", D. Roy Choudhury and Shail B. Jain, 4th edition, Reprint 201	0, New Age							
International.	(Module	-1,2,3,4 & 5)								
2. "Op - Amp	s and Lin	ear Integrated Circuits", Ramakant A. Gayakwad, 4th edition, PHI (Mod	lule-3)							
3. "A course	in Electr	ical & Electronic Measurements & Instrumentation", A K Sawhney, I	Dhanpat Rai							
Publications,	19th editi	on, 2011.(Module-5)								
Reference bo	ooks:									
Reference Bo	oks: 1. "C	Operational Amplifiers and Linear Integrated Circuits", Robert. F. Cougl	hlin & Fred.							
F. Driscoll, P	HI/Pearso	n, 2006								
Course outco	omes:									
On completion	on of the	course, the student will have the ability to:								
Course	CO #	Course Outcome (CO)								
Code										
21EI42	CO1	Design and develop basic op-amp circuits.								
•	CO2	Design and develop op-amp circuits to meet the practical applications.								
•	CO3	CO3 Design regulator circuits and filter circuits.								
•	CO4 Describe the operation and applications of 555 timer and PLL.									
(CO5	Apply data acquisition system components and implement the op-amp electronic gadgets	circuits in							

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3		3	2								2	3	2	
CO2	3		2	2								1	3	2	
CO3	3		-	2								1	3	2	
CO4	2		3	1								1	2	2	
CO5	3		3	2								1	3	2	

Course Title: Network Analysis							
Course Code	21EI43	CIE: 50					
Number of	03 Hrs.(Theory) + 02 Hrs.(Tutorial)	SEE: 50					
Lecture Hours/Week		CEE					
Hours :42	Credits: 03	Hours: 03					
Prerequisite: Basic Electrica	l Engineering.						
 Course Objectives 1. To import the knowledge of production of circuits. 2. To understand the basic concept of electrical laws. 3. Make the students to understand the behavior of circuits. 4. To implement the Laplace transform for Electrical circuits. 							
Modules							
Module I Basic concepts-I: Ideal, practical and dependent sources, source transformation, star to delta to star transformation, network reduction techniques, mesh and super- mesh analysis for DC, AC and dependent circuits.							
 Basic concepts -II: Nodal and super-node analysis for DC, AC and dependent source circuits. Network topology: Graph of a network, concept of tree and Co tree, incidence matrix, tie set and cut set schedule, formation of equilibrium equation in matrix form matrix of deality. 							
	Module III						
Network theorems: Super theorem ,Thevenin's theorem theorem.	position theorem, reciprocity theorem, Millman's n, Norton's theorem and Maximum power transfer	08 Hrs					
	Module IV						
Transient behavior and init switching conditions and t conditions in RL, RC and RL	tial conditions: Behavior of electrical elements under heir representation, evaluation of initial and final <i>C</i> circuits for or DC and AC excitation.	08 Hrs					
	Module V						
Two port network: Definiti	ons of Z, Y, H, ABCD of parameters, modeling with						
these parameters and the relationship between this parameter sets.							
impulse response and waveform synthesis.							
Question paper pattern: Total ten questions will be asked. Two from each module. The student has to answer five questions, selecting at least one from each module.							
Text Books: 1. M.E. Van Valkenburg " ne	twork analysis ".PHI/Person education						
2. Roy Choudhary," network and Systems ", new Age International Publications.							

Reference	Books:									
1. "Engine	ering circu	uit analysis", Hayt, Kemmerly and Durbin TMH publication.								
2. "Networ	2. "Network analysis and synthesis", Franklin F,Kuo, Wiley International edition.									
Course Ou	Course Outcomes:									
On comple	etion of tl	he course, the student will have the ability to:								
Course	urse CO # Course Outcome (CO)									
Code										
21EI43	CO1	Classify the types of sources, Perform network analysis using mesh & loop								
		technique and network reduction techniques to electrical circuits.								
	CO2	Implement and analyze the electric circuit using Nodal and Network								
		Topology techniques								
	CO3	Co-relate and compose the electrical circuit using Network theorem for								
		analysis.								
	CO4	Examine the Transient behavior of the electrical circuits and determine the								
		initial and final condition of circuits.								
	CO5	Analyze the circuit using two port network concept and Laplace transform.								

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3										2	3	3	
CO2	3	3										2	3	3	
CO3	3	3										2	3	3	
CO4	3	3										2	3	3	
CO5	3	3										2	3	3	

Course	e Title: Microcontroller and Embedded Systems						
Course Code	21EI44	CIE: 50					
Number of Lecture Hours/Week	03 Hrs (Theory)	SEE: 50					
Total Number of Lecture Hours: 42	Credits: 03	SEE Hours: 03					
Prerequisite: Microprocessor	"S						
 Course Objectives: 1. To understand the differences between Microprocessors and Microcontrollers. 2. To realize the architecture and features of typical microcontroller 8051 and PIC Microcontroller. 3. To learn the interfacing of real world input and output devices of 8051. 4. To study various hardware and software tools for developing applications. 5. To understand architecture, features and programming of typical PIC Microcontroller. 							
Modules							
Introduction to Microcontrollers: 8 bit microprocessors and microcontroller architecture and their comparison, Harvard and Von-Neumann architecture, RISC and CISC architecture. Survey of microcontroller family. Intel 8051 microcontroller architecture, features Pin diagram, memory organization, 8051 register banks and special function registers. Program counter, stack and stack pointer. Flag bits and program status word (PSW) register.							
Addressing Modes of 805 instruction. Data exchange, arithmetic operations, jump Assembly language program	Module II 1: Instruction set of 8051, stack and stack related of rotate and swap operation, incrementing, decrementing, and call instruction, Call and returns Subroutines. ming of 8051.	08 Hrs					
Assembly language programming of 8051.Module IIIInterfacing and case studies: Interfacing of LCD, 7 Segment display, Interfacing of8051 with 8 bit ADC and DAC, interfacing of key board, Interfacing of 8051 withPC through RS232. Speed control of DC motor, temperature controller, relayinterfacing with external memory.							
Module IV							
memory organization and types, stack, program counter, Program status word, data pointer, watch dog timer, sleep mode, Oscillator and clock for fetch and execute sequence.							
	Module V						
Instruction Set and their literal and control operat incrementing, decrementing	Features : Byte oriented, bit oriented instruction and ions. Data exchange, rotate and swap operation, g, arithmetic operations, jump and call instruction	08 Hrs					

Assembly language programming,

Question paper pattern:

Total ten questions will be asked. Two from each module. The student has to answer five questions, selecting at least one from each module.

Text books:

- 1. Mohammed Ali Mazidi and Janice Gillispie Mazidi, "The 8051 Microcontroller and Embedded Systems", Pearson Education Asia, New Delhi, 2003.
- 2. MICROCHIP PIC Micro mid-range MCU family reference manual.

Reference Books:

- 1 "Microprocessors and Microcontrollers", B. P. Singh, Galcotia Publications (P) Ltd, Fristedition, New Delhi, 1997.
- 2. Embedded Controller Handbook, Intel Corporation, USA.
- 3. Design of PIC Microcontrollers, J. B. Peatman, PH Engg, 2008.

Course outcomes:

On completion of the course, the student will have the ability to:

Course	CO #	Course Outcome (CO)
Code		
21EI44	CO1	Explain the basic concept of microprocessor and microcontroller family
		with comparison.
	CO2	Describe the knowledge of Addressing modes of 8051
	CO3	Illustrate the concept of interface of 8051 with different devices.
	CO4	Demonstrate the architecture of PIC16F877 microcontroller
	CO5	Develop assembly language program for arithmetic, logical and various special operations of both 8051 and PIC Microcontroller16F877.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1											3		
CO2	2	2	3	1									2	2	
CO3	2	3	2	1									2	2	
CO4	3	1	2	1									3		
CO5	2	3	2	2									2	2	

Course Title: Samskrutika Kannada						
Course Code	21KAK45	CIE: 50				
Number of Lecture Hours/Week	02 Hrs (Theory)	SEE: 50				
Total Number of Lecture Hours: 28	Credits: 01	SEE Hours: 1.5				

Prerequisite: Humanities and Social Sciences (H.S.S)

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯಮಸ್ತಕ

(ಕನ್ನಡ ಮಾತೃಭಾಷೆಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ)

(ಕನ್ನಡಿಗರಿಗಾಗಿ - for Kannadigas - Common to all branches)

[As per Outcome Based Education (OBE) and Choice Based Credit System (CBCS) scheme]

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:

- ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡದ ಜೊತೆಗೆ ಕ್ರಿಯಾತ್ಮಕ ಕನ್ನಡವನ್ನು, ಕನ್ನಡ ಸಾಹಿತ್ಯ, ಸಂಸ್ಕೃತಿ ಮತ್ತು ನಾಡು ನುಡಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
- ಕನ್ನಡದಲ್ಲಿ ತಾಂತ್ರಿಕ ವಿಜ್ಞಾನಗಳ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಹಲವಾರು ವಿಷಯಗಳನ್ನು ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
- ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ, ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

ಪರಿವಿಡಿ

ಭಾಗ – ಒಂದು ಲೇಖನಗಳು ಕನ್ನಡ ನಾಡು, ನುಡಿ ಮತ್ತು ಸಂಸ್ಕೃತಿಗೆ ಸಂಬಂಧಿಸಿದ ಲೇಖನಗಳು ೧. ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ : ಹಂಪ ನಾಗರಾಜಯ್ಯ ೨. ಕರ್ನಾಟಕದ ಏಕೀಕರಣ : ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ – ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯ ೩. ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ – ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ ಮತ್ತು ಪ್ರೊ. ವಿ. ಕೇಶವಮೂರ್ತಿ * ಭಾಗ – ಎರಡು ಕಾವ್ಯ ಭಾಗ (ಆಧುನಿಕ ಪೂರ್ವ)

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೪. ವಚನಗಳು : ಬಸವಣ್ಣ, ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯ,
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ಜೇಡರ ದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ.

- ೫. ಕೀರ್ತನೆಗಳು : ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ ಪುರಂದರದಾಸ ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೆ – ಕನಕದಾಸ
- ೬. ತತ್ವಪದಗಳು : ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು ಶಿಶುನಾಳ ಷರೀಫ ಶಿವಯೋಗಿ – ಬಾಲಲೀಲಾ ಮಹಾಂತ ಶಿವಯೋಗಿ

2. ಜನಪದ ಗೀತೆ : ಬೀಸುವ ಪದ, ಬಡವರಿಗೆ ಸಾವ ಕೊಡಬೇಡ

ಭಾಗ – ಮೂರು

ಕಾವ್ಯ ಭಾಗ (ಆಧುನಿಕ)

೮. ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ : ಡಿ.ವಿ.ಜಿ.

೯. ಕುರುಡು ಕಾಂಚಾಣಾ : ದ.ರಾ. ಬೇಂದ್ರೆ

೧೦. ಹೊಸಬಾಳಿನ ಗೀತೆ : ಕುವೆಂಪು

೧೧. ಹೆಂಡತಿಯ ಕಾಗದ : ಕೆ.ಎಸ್. ನರಸಿಂಹಸ್ವಾಮಿ

೧೨. ಮಬ್ಬಿನಿಂದ ಮಬ್ಬಿಗೆ : ಜಿ.ಎಸ್. ಶಿವರುದ್ರಪ್ಪ

೧೩. ಆ ಮರ ಈ ಮರ : ಚಂದ್ರಶೇಖರ ಕಂಬಾರ

೧೪. ಜೋಮನ ಮಕ್ಕಳ ಹಾಡು : ಸಿದ್ದಲಿಂಗಯ್ಯ

ಭಾಗ – ನಾಲ್ತು

ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿ ಪರಿಚಯ, ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ

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೧೫. ಡಾ. ಸರ್ ಎಂ ವಿಶ್ವೇಶ್ವರಯ್ಯ – ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ : ಎ ಎನ್ ಮೂರ್ತಿರಾವ್

೧೬. ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ

೧೭. ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ : ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ

ಭಾಗ – ಐದು

ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ

೧೮. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ : ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ

೧೯. 'ಕ' ಮತ್ತು 'ಬ' ಬರಹ ತಂತ್ರಾಂಶಗಳು ಮತ್ತು ಕನ್ನಡದ ಟೈಪಿಂಗ್*

೨೦. ಕನ್ನಡ – ಕಂಪ್ಯೂಟರ್ ಶಬ್ದಕೋಶ*

೨೧. ತಾಂತ್ರಿಕ ಪದಕೋಶ : ತಾಂತ್ರಿಕ ಹಾಗೂ ಪಾರಿಭಾಷಿಕ ಕನ್ನಡ ಪದಗಳು*

* (ಅಧ್ಯಾಯ 3, 19, 20 ಮತ್ತು 21 ಇವುಗಳು ವಿತಾವಿ ಯದಿಂದ ಪ್ರಕಟಿತ " ಆಡಳಿತ ಕನ್ನಡ "

ಮಸ್ಕಕದಿಂದ ಆಯ್ದ ಲೇಖನಗಳು - ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ ಮತ್ತು ಪ್ರೊ. ವಿ. ಕೇಶವಮೂರ್ತಿ.



Course Title: Balake Kannada					
Course Code	21KAN45	CIE: 50			
Number of Lecture Hours/Week	02 Hrs (Theory)	SEE: 50			
Total Number of Lecture Hours : 28	Credits: 01	SEE Hours: 1.5			
Prerequisite: Humanities and Social Sciences (H.S.S)					

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯಪುಸ್ತಕ

baLake Kannada Text Book for VTU

(Common to B.Arch, B.Plan and B.E/B.Tech of all branches) [As per Outcome Based Education (OBE) and Choice Based Credit System (CBCS) scheme]

Course Learning Objectives:

The course will enable the non Kannadiga students to understand, speak, read and write Kannada language and communicate (converse) in Kannada language in their daily life with kannada speakers.

Table of Contents

Introduction to the Book

Necessity of learning a local langauge:

Tips to learn the language with easy methods.

Easy learning of a Kannada Language: A few tips

Hints for correct and polite conservation

Instructions to Teachers for Listening and Speaking Activities

Key to Transcription

Instructions to Teachers

Part – I Lessons to teach and Learn Kannada Language

Lesson – 1	ವೈಯಕ್ತಿಕ, ಸ್ವಾಮ್ಯಸೂಚಕ/ಸಂಬಂಧಿತ ಸಾರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ
	ಪದಗಳು - Personal Pronouns, Possessive Forms, Interrogative words
Lesson – 2	ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು
	ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು - Possessive forms of nouns, dubitive question and Relative nouns
Lesson – 3	ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು
	Qualitative, Quantitative and Colour Adjectives, Numerals
Lesson – 4	ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು – ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ – (ಆ, ಅದು, ಅವು,
	అల్లి) Predictive Forms, Locative Case
Lesson – 5	ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು – Dative Cases, and
	Numerals
Lesson – 6	ಸಂಖ್ಯಾಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು - Ordinal numerals

and Plural markers

Lesson – 7	ನ್ಯೂನ / ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು ಮತ್ತು ವರ್ಣ ಗುಣವಾಚಕಗಳು							
	Defective / Negative Verbs and Colour Adjectives							
Lesson – 8	ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತು ಒತ್ತಾಯ ಆರ್ಥರೂಪ							
	ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು - Permission, Commands, encouraging and Urging words (Imperative words and sentences)							
Lesson – 9	ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು							
	ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು							
	Accusative Cases and Potential Forms used in General Communication							
Lesson – 10	"ಇರು ಮತ್ತು ಇರಲ್ಲ." ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು							
	ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು							
	Helping Verbs "iru and iralla", Corresponding Future and							
	Negation Verbs							
Lesson – 11	ಹೋಲಿಕೆ (ತರತಮ), ಸಂಬಂಧ ಸೂಚಕ ಮತ್ತು ವಸ್ತು ಸೂಚಕ							
	ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ							
	Comparitive, Relationship, Identification and Negation Words							
Lesson – 12	ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು							
	Different types of forms of Tense, Time and Verbs							
Lesson – 13	ದ್, -ತ್, - ತು, - ಇತು, - ಆಗಿ, - ಅಲ್ಲ, - ಗ್, -ಕ್, ಇದೆ, ಕ್ರಿಯಾ							
	ಪ್ರತ್ಯಯಗಳೊಂದಿಗೆ ಭೂತ, ಭವಿಷ್ಯತ್ ಮತ್ತು ವರ್ತಮಾನ ಕಾಲ ವಾಕ್ಯ ರಚನೆ							
	Formation of Past, Future and Present Tense Sentences with							
	Verb Forms							
Lesson – 14	ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮತ್ತು ರಾಜ್ಯದ ಬಗ್ಗೆ ಕುರಿತಾದ ಇತರೆ ಮಾಹಿತಿಗಳು							
	Karnataka State and General Information about the State							
Lesson – 15	ಕನ್ನಡ ಭಾಷೆ ಮತ್ತು ಸಾಹಿತ್ಯ -							
	Kannada Language and Literature							
Lesson – 16	ಭಾಷೆ ಕಲಿಯಲು ಏನನ್ನುಮಾಡಬೇಕು ಮತ್ತು ಮಾಡಬಾರದು							
_	Do's and Don'ts in Learning a Language							
Lesson – 17	PART - II							
	Kannada Language Script Part – 1							

Lesson – 18 PART - III Kannada Vocabulary List : ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು - Kannada Words in Conversation

Co	urse Title: Organic Farming: Horticulture							
Course Code	21EIAE46A	CIE: 50						
Number of Lecture Hours/Week	Number of Lecture Hours/Week02 Hrs.(Theory)SE							
Total Number of Lecture Hours :30Credits : 02SEE Hours: 02								
Prerequisite: None								
Course Objectives								
This course will enable the studen 1. 2. 3.	nts to							
	Modules	Teaching Hours						
	Module I	110015						
Organic Farming Concepts and P Organic Farming and Climate Ch	rinciples, Soil Preparation, Quality of soil, carbon, p^{H} , N_{2} etc ange, Importance of Horticultural Crops	06 Hrs						
	Module II							
Horticultural crops and Human Nutrition, Principles of Horticulture Crop Production, Selection of seeds, seedlings, climatic condition of a crop, Essential Plant Nutrients, their Deficiency Symptoms and Toxicities in Horticultural Crops								
Module III								
Organic and inorganic manures Principles of Compost Production	and their methods of application in horticultural crops, n, Vermicompost Production Technology	06 Hrs						
	Module IV							
Introduction to Pest and Disease J Farming, Weed Management in H Horticultural Crops	Management, Pest and Disease Management in Organic Iorticultural Crops, Harvesting, Handling and Storage of	06 Hrs						
	Module V	06Hrs						
Case studies of successful organic fareport writing.	rming, visit to a nearby organic farm/horticulture institute and							
Question paper pattern: Total ten questions will be aske selecting at least one from each n	ed. Two from each module. The student has to answer five nodule	e questions,						
Text books/References								
1. Organic Farming for Sustainable Agricultural Production, Dillip Kumar Swain, Department of Agricultural and Food Engineering, Indian Institute of Technology, Kharagpur (NPTEL Course Selected								
notes) 2. Basic Horticulture, Dr. S. K. Upadhyay, Dr. R.R. Sharma, Dr. Hare Krishna. Dr. Manish Srivastav, The secretary CBSE. Preet Vibar, Delhi								
3. Fundamentals of Horticulture, Dr. G. S. K. Swamy, Dr. J. Auxcilia, AgriMoon.Com								
Course outcomes:	Course outcomes:							
On completion of the course, th	e student will have the ability to:							

Course	CO #	Course Outcome (CO)
Code		
21EIAE46A	CO1	Appreciate the need, concept and components of organic farming.
	CO2	Understand the selection of seeds and its needs.
	CO3	Analyze the role of manures and their production
	CO4	Explain the damages due to pest and disease and their mitigation methods.
	CO5	Appraise the case studies and write a report on the successful stories of organic farming.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															

	Course 7	Fitle: Cours	e Title: Signal Condit	ioning Lab Using MULTISIM	
Course Code			2	1EIAE46B	CIE: 50
Number of Pr Hours/Week	actical		03 H	Irs.(Practical)	SEE: 50
			С	Credits: 01	SEE Hours: 03
Prerequisite:	Analog	and Digital	Circuits Theory		
Course Obje 1. To learn th 2. To underst 3. To use MU	ctives e linear and the ULTISIN	and non-lin fundamenta 1/ PSPICE	ear applications of op ls of ADC and DAC c software for circuit de	erational amplifiers. conversion techniques. sign.	
			Experiments: Using P		
1. To realize	using oj	p-amp an I	verting Amplifier and	Non- Inverting Amplifier.	
2. To realize	using o	p-amps i) S	umming Amplifier ii)	Difference amplifier.	
3. To realize	using o	p-amp an	nstrumentation Ampli	fier.	
4. To realize	using o	p-amps i) I	ifferentiator ii) Integra	ator	
5. To realize	using of	p-amps a F	Ill wave Precision Rec	ctifier.	
6. To realize	using of	p-amp an I	verting Schmitt Trigg	er.	
7. To design i) Butterw	and imp	olement usi II order Lo	ng op-amps v Pass Filter ii) Butte	rworth I &II order High Pass	Filter
8. To design	and imp	lement usi	ng op-amp an RC Phas	se Shift Oscillator.	
9. To realize	using of	p-amp an A	stable Multivibrator.		
10. To design	and imp	plement M	ono-stable Multivibrat	or using 555 timer.	
11. To design	and imp	plement an	8-bit Successive appro	oximation Analog to Digital C	onverter.
12. To design	and imp	plement 4-	it R-2R Digital to Ana	alog Converter.	
Course outco	omes:			1 1 010 /	
On completion	on of th $CO \#$	e course, t	ie student will have t	he ability to:	
Code	0	Course C			
21EIAE46B	CO1	Sketch/ troubleshe independe	draw circuit schem oot circuits containing nt sources.	atics, construct circuits, a op-amps, resistors, diodes, ca	analyze and apacitors and
	CO2	Relate to amp.	he manufacturer's data	a sheets of IC 555 timer and I	С µа741 ор-
	CO3	Realize an amplifiers	d verify the operation, Precision Rectifiers.	of analog integrated circuits l Oscillators using PSPICE.	ike
	CO4	Analyze t PSPICE.	ne performance of filte	ers, multivibrators, ADC and I	DAC using

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3						3	3			3	2	
CO2	2	2	3						3	2			2	2	
CO3	2	2	3						3	2			2	2	
CO4	3	2	3						3	2			3		
CO5	3	3	3						3	2			3		

Universal Human Values-II							
Course Code	21UHV46C	CIE: 50					
Number of Lecture	Number of Lecture						
Hours/Week 2Hrs (Tutorial)							
Total Number of							
Theory Hours : 14 Credits: 01							
Course Objectives:	· · · · · · · · · · · · · · · · · · ·						
 To facilitate the students to underst To facilitate the students in applyin lead an ethical life. 	and harmony at all the levels of human living, and live g the understanding of harmony in existence in their pro-	accordingly. ofession and					
	Modules	Teaching Hours					
Module IImplications Of The Right Understanding: Providing The Basis For Universal HumanValues And Ethical Human Conduct- Value In Different Dimensions Of Human living, Universal Values Naturally Emerging From The Right Understanding, Definitiveness Of Ethical Human Conduct, Identification Of Svatva Leading To Svatantrata And Svarajya, Development Of Human Consciousness, Implications Of Value-Based Living.							
Module IIBasis For The Holistic Alternative Towards Universal Human Order: Identification OfComprehensive Human Goal, Vision For The Holistic Alternative, Basis For HumanisticEducation And Humanistic Constitution, Universal Human Order And Its Implications.							
	Module III						
Professional Ethics In The Light Of Comprehensive Human God, Ensuring Professional Ethics-The Current Scenario Resolutions.	Right Understanding: Profession-In The Light Of Competence In Professional Ethics, Issues In , Inherent Contradictions And Dilemmas And Their	03 Hrs					
	Module IV						
Vision For Holistic Technologies, Production Systems And Management Models: The Holistic Criteria For Evaluation, A Critical Appraisal Of The Prevailing Systems, Learning From The Systems In Nature And Traditional Practices, Holistic Technologies And Systems- Typical Case Studies							
	Module V						
Journey Towards the Holistic Alternative- The Road Ahead: Appreciating The Need For Self-Exploration, Facilitating The Understanding Of Harmony At Various Levels, Steps For Evaluation At The Individual Level, Steps For Transition At The Level Of Family, Society And Profession, Promoting Mass Awareness And Moving Towards Humanistic Education, Evolving Holistic Models Of Living, Amending Policies, Programs And Social Systems In Tune With Comprehensive Human Goal, Is The Transition Too Difficult?, Concluding Remarks.							
Text Books: 1. The Text Book R.R Gaur, R Sangal Professional Ethics, Excel Books, New	, G P Bagaria, A Foundation Course In Human V Delhi, 2010, ISBN 978-8-174-46781-2.	alues And					

2. The teacher's manual R.R Gaur, R Sangal, G P Bagaria, A foundation course in Human Values and

professional Ethics – Teachers Manual, Excel books, New Delhi, 2010

Reference Books:

- 1. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
- 2. PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
- **3.** Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
- 4. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
- **5.** Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, limits to Growth, Club of Rome's Report, Universe Books.
- 6. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
- 7. A Nagraj, 1998, Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
- 8. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.
- 9. A.N. Tripathy, 2003, Human Values, New Age International Publishers.

Course outcomes: On completion of the course, the student will have the ability to:

Course Code	CO	Course Outcome (CO)						
	CO1	The students are able to visualize the co-relation between lack of human values						
		and the prevailing problems.						
	CO2	They are also able to visualize tangible steps and a roadmap for moving in the						
		cherished direction.						
2111HV/6C	CO3	The students are able to visualize an appropriate utilization of the knowled,						
210111400		their respective streams to ensure mutually enriching and sustainable systems.						
	CO4	The students are able to sincerely evaluate the course and the transformation						
		achieved in this process.						
	CO5	They are also able to make use of this understanding for moving towards happy						
		and prosperous life including an ethical conduct of their profession.						

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															

Course Title: Signal Conditioning Circuits Lab											
Course Code		21EIL41	CIE: 50								
Number of Practical Hours/Week		03 Hrs.(Practical)	SEE: 50								
		Credits: 01	SEE Hours: 03								
Prerequisite: Anal	og Electronic	es (16EI32)									
Course Objective This laboratory • Understand t • Realize and t • Implement fi • Realize the o functions	es y course enab he working o eest amplifier ltering circui p-amp circui	bles students to: if op-amp. as amplifier, inverter and scale changer and oscillator circuits for the given specifications ts for signal processing applications ts for the applications such as DAC, implement mather	matical								
List of Experiments											
1. Measure Op-am	p parameters	s such as offset voltage, CMRR, slew rate.									
2. Design and imp Voltage Follow	lement Inver er.	ting Amplifier, Non-Inverting Amplifier and									
3. Realize Full wa	ve Precision	rectifier using op.amp									
4. Design and imp		rworth Second order Low-pass filter									
5. Design and imp	lement Instru	rworth Second order High-pass filter									
7. Design Voltage	regulator usi	ing 723 IC.									
8. To design and in	mplement RC	C Phase shift oscillator									
9. Design and imp	lement astab	le and monostable multivibrator.									
10.To design and	implement W	ein bridge oscillator									
11.To design and	implement as	table multivibrator using 555 timer									
12.To design and	implement 4	bit R-2R DAC using discrete components.									
13.Implement 8-bi	it ADC using	ADC 0809 IC									
Course outcomes	the course	the student will have the chility to:									
Course CO #	<i>i course,</i> <i>i</i> Course O	utcome (CO)									
Code		· ·									
21EIL41 CO1	Measure v	various op amp parameters.									

CO2	Design and evaluate analog integrated circuits like Amplifiers, Oscillators
	and compare the experimental results with theoretical values
CO3	Design and evaluate analog integrated circuits like Precision Rectifiers and
	Filters and compare the experimental results with theoretical values
CO4	Design and implement voltage regulator and Data converters.
CO5	Design various multivibrators using timer.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3						3	2			3	2	
CO2	2	2	3						3	2			2	2	
CO3	2	2	3						3	2			2	2	
CO4	3	2	3						3	2			3		
CO5	3	3	3						3	2			3		

		Cor	urse Title: Microcontrollers Lab								
Course Cod	le		21EIL42	CIE: 50							
Number of Hours/Weel	Practical k		03 Hrs (Practical)	SEE: 50							
			Credits: 01	SEE Hours: 03							
Prerequisite	: Microp	processor Lab	b (16EI48)								
Course Ob To make stu 1. The opera 2. The vario 3. The move 4. The inter	jectives idents re ation of a bus logic ement, s facing o	alize arithmetic op al operations toring and tra f microcontro	peration like addition, subtraction, multiplica s like OR, AND etc. ansfer of data within the 8051 microcontrolle oller with various applications.	tion. er.							
1 Drogram	on 8 on	d 16 bit Arit	List of Experiments	Itiplication)							
1. Programs	s on log	ical operation	ninetic operations (addition, subtraction, ind	ntipilication)							
2. Flograms	 2. Programs on Logical operations (AND, UK, NUK) 3. Programs on transfer of data's 										
4 Programs	$\frac{1}{1}$ on usin	g of stack									
5. Programs	on usin	g specific ad	dress								
6. Programs	on stori	ng of data									
7. Interfacin	ng of 805	1 with LCD	display								
8. Interfacin	ng of 805	1 with DAC	and its applications								
9. Interfacin	ng of 805	1 with ADC	and its applications								
10. Interfaci	ing of 80	51 with DC	Motor to control its speed								
11. Interfaci	ing of 80	51 with step	per motor								
12. Interfaci	ing of 80	51 to genera	te quare waveforms								
13. Interfaci	ing of 80	51 to genera	te triangular wave forms								
14. Interfaci	ing of 80	51 to control	l the temperature								
Course out	comes:	h									
On comple Course	uon of t	ne course, th Course Ou	ne student will have the ability to:								
Code											
21EIL42	CO1	Develop the	e programs on various arithmetic operations.								
	CO2	Develop the	e program on various logical operations.								
	CO3	Apply the 8051.	programming techniques in developing spo	ecial operations of							

CO4	Apply programming techniques in developing and solving problems of microcontroller applications.
CO5	Perform interfacing of 8051 microcontroller.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2						3	3		2	3	3	
CO2	3	3	2						3	3		2	3	3	
CO3	2	3	3						3	3		2	2	3	
CO4	2	3	3						3	3		2	2	3	
CO5	2	3	3						3	3		2	2	3	

		Course Title: Verilog Lab										
Course Cod	e	21EIL43	CIE: 50									
Number of Practical He	urs/We	03 Hrs.(Practical)	SEE: 50									
		Credits: 01	SEE									
Prerequisite	: Digital	System Design (21EIE33)	Hours. 05									
Course Obj The cours 1. The ab 2. Know 1 3. Unders 4. Unders	jectives se should ility to c the diffe stand lib stand the	d enable the students to: ode and simulate any digital function in Verilog HDL. rence between synthesizable and non-synthesizable code. rary modeling, behavioral code and the differences between then differences between simulator algorithms.	1.									
5. Learn g	5. Learn good coding techniques per current industrial practices.											
1. Realizatio	on of a E	Boolean function using verilog code.										
2. Design of	f decode	r and encoder using verilog code.										
3. Design of	f multipl	exer and de multiplexer using verilog code.										
4. Design of	f code co	onverters using verilog code.										
5. Full adde	r and ful	ll subtractor design modeling using verilog code.										
6. Design of	f 8-bit A	rithmetic logic unit using verilog code.										
7. Verilog n	nodel for	r flip flops implementation.										
8. Design of	fripple	counter using verilog code.										
9. Implemen	ntation o	f universal shift register using verilog code.										
10.Verilog o	code for	realization of carry look ahead adder.										
11. Verilog	code to	detect a sequence.										
12.Verilog o	codes for	r interfacing and debugging.										
Course out On complet	comes: tion of t	he course, the student will have the ability to:										
Course Code	CO #	Course Outcome (CO)										
21EIL43	CO1	Write the Verilog programs to simulate Combinational circuits Dataflow, Behavioral description.	in									
	CO2	Describe sequential circuits like flip flops and counters in description and obtain simulation waveforms.	Behavioral									
	CO3	Synthesize Combinational and Sequential circuits on programm test the hardware.	able ICs and									
	CO4	Write the Verilog programs to detect sequence and ALU implementation of the sequence and ALU implementation of the sequence and ALU implementation of the sequence and the seque	nentation.									
	CO5	Interface the hardware to the programmable chips and obtain output.	the required									

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	3									3	3	
CO2	3	2	2	3									3	3	
CO3	3	2	2	3									3	3	
CO4	3	2	2	3									3	3	
CO5	3	3	2	3									3	3	