



KONGU ENGINEERING COLLEGE

(Autonomous)

PERUNDURAI, ERODE – 638060



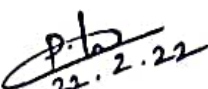
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

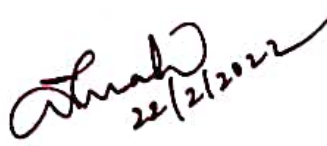
Date: 22.02.2022

CIRCULAR

The following courses are approved by Curriculum and Development Cell (CDC) for this semester (2021-2022 even). The students may enroll themselves based on their willingness to attend the course. The courses will start from March 2022 onwards.

S.No.	Course Code	Name of the One credit course
1.	18VAC81	ASIC design using Cadence
2.	18VAC69	Real time project development using Image Processing and Machine Learning
3.	20VC015	Modeling and deployment Onto SoC using MATLAB and SIMULINK
4.	20VC024	Biomedical Systems and Wearable Medical Services
5.	18VAC88	System Design using MSP430 microcontroller and Code Composer Studio
6.	18VAC89	Industrial communication standards and measurements
7.	18VAC90	Long range technology for IoT application using LORA WAN
8.	20VC025	Long range technology for IoT application using LORA WAN
9.	18VAC91	QCA design for digital Electronics


22.2.22
Faculty Incharge


22/2/2022
HOD / ECE

Kongu Engineering College, Perundurai, Erode- 638060.
Department of ECE

Date: 28.05.2022

One Credit Course

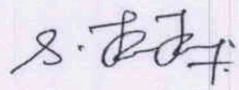
Department of Electronics and Communication Engineering is conducting an one credit course on **Industrial Communication, Standards and Measurements** in association with industrial experts from M/s. Elmack Engg Services, Chennai. The industrial sessions are organized in the Communication System Design Lab, department of ECE during 27.05.2022 & 28.05.2022. On behalf of the ECE department, we thank the industry experts who have shared their knowledge with the participants.

Details of the industrial experts:-

1. ~~Mr.~~ Raghuraman. DY

RF Application Engineer

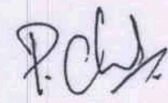
Elmack Engg Services Pvt Ltd. Chennai



2. Mr. P.Chellaperumal

Sales Engineer

Elmack Engg Services Pvt Ltd. Chennai



N. D. J. 28/5/22
Faculty incharge

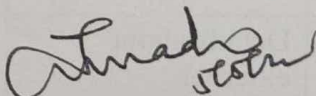
 KONGU ENGINEERING COLLEGE (Autonomous) PERUNDURAI – 638060 INTERNAL QUALITY ASSURANCE CELL	Approval for Value Added Course (One/Two Credits)		 CERT No.:99-100-20788 ISO 9001 : 2015

Academic Year: 2021-22 EVENSEMESTER

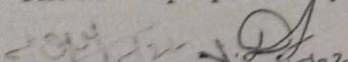
DEPARTMENT OF ECE

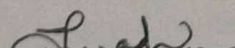
Date:05.05.2022

1.	Academic Year	:	2021-22	Semester : EVEN			
2.	Course Title	:	Industrial Communication, Standards and Measurements	Credit(s): One			
3.	Type of Course	:	Updated Course				
	• If "Already offered course",	:	Course Code:	Version:			
4.	Course Coordinator(s)	:	1. Dr.V.Dinesh, Associate Professor/ECE 2. Dr.J.Vijayalakshmi, Associate Professor/ECE				
5.	Course offered by	:	Internal faculty & External experts				
6.	Name and designation of external resource persons	:	1. Mr. Kabilan, Application Engineer Elmack Engg Services Pvt Ltd, Chennai 2. Mr. Raghuraman RF Application Engineer Elmack Engg Services Pvt Ltd, Chennai				
7.	Details about external organization	:	Annexure				
8.	Course fee for external experts		Max. number of students/Batch		Course fee / student		
	-		30		Rs.300/-		
9.	No. of days	Period		No. of hours		Venue/ Meet ID	
		From	To	Lecture	Practical		Total
	11	15.01.22	15.05.22	10	20	30	Communication System Design lab, Department of ECE
10.	Pre-requisites for offering the course	:	Nil				
11.	Course offered to	:	Programme		Branch	Year/Semester	
		:	B.E		ECE	III Yr/VI Sem	
12.	Course Main	:	Day 1	Introduction to RF communication, Transmission systems –			

Contents		standards, Performance evaluation of RF communication systems,		
	Day 2	Troubleshooting-RF communication systems, Calibration of industrial RF equipments, Modulation and Demodulation of Mobile signals using VSA tool.		
	Day 3	Introduction to Impedance matching techniques		
	Day 4	Power Spectral estimation using Spectrum analyzer		
	Day 5	Design and analyze of microstrip line, Power divider, coupler and mixer		
	Day 6	Design and analyze reconfigurable antenna, rectangular waveguide and Horn antenna		
	Day 7	Principles of doppler shift in radar communications		
	Day 8	Measurement of speed, rotation, contact less vibration measurements using Radar,		
	Day 9	Transmission and reception of video signal using satellite trainer kit.		
	Day 10	Test		
		Assignment		
13.	Course Outcomes	: After completing the course the student will be able to: • calibrate and troubleshoot the industrial RF communication systems and summarize the knowledge of the satellite and radar communication principles. • evaluate and test the performance of RF equipments and standards • analyze the performance of RF circuits and antenna for wireless communication		
14.	Course Assessment (Min. 2)	: S. No.	Type	Max. Marks
		1.	Objective Questions	50
		2.	Laboratory assessment	50
			Total	100 Marks
15.	Verified that the content of this course is not offered to students partially/fully in regular curriculum of respective programme of the student. Certify that the course content, credits and grade are approved in the BOS meeting or approved by internal BOS members and will be ratified in the next BOS meeting			 (Signature of the HoD after verification)
16.	Any other details	: -		

The above proposal may kindly be approved.


 Course co-ordinator(s)


 HOD

ChiefCoordinator/Academic

Encl:

1. Copy of the syllabus of the course
2. Financial proposal from the external organization (if any)

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Annexure

I. Name of the Industry & Experts:

1. Mr. Kabilan,

Application Engineer

ElmackEngg Services Pvt Ltd, Chennai

2. Mr. Raghuraman

RF Application Engineer

ElmackEngg Services Pvt Ltd, Chennai

II. Need for the Industry participation:

- The company will bring advanced equipment which are not available in our college to give hands on exposure.
- M/s.ElmackEngg Services, Chennai will deliver the following contents:
 1. Hands on training in RF communication systems using VSA tool with RF source and Spectrum Analyzer
 2. Testing and calibration of industrial RF and microwave equipment using VNA

Kongu Engineering College, Perundurai-638060
Department of Electronics and Communication Engineering

INDUSTRIAL COMMUNICATION, STANDARDS AND MEASUREMENTS

Session Schedule

S.No	Name of the topic	No.of Hours	Handled By
1.	Introduction to RF communication	2	Mr. Kabilan Application Engineer Elmack Engg Services Pvt.Ltd
2.	Transmission systems -standards	2	Mr. Kabilan Application Engineer Elmack Engg Services Pvt.Ltd
3.	Performance evaluation of RF communication systems	2	Mr. Kabilan Application Engineer Elmack Engg Services Pvt.Ltd
4.	Troubleshooting-RF communication systems	2	Mr. Raghuraman Application Engineer Elmack Engg Services Pvt.Ltd
5.	Calibration of industrial RF equipments	2	Mr. Raghuraman Application Engineer Elmack Engg Services Pvt.Ltd
6.	Introduction to Impedance matching techniques	2	Dr.V.Dinesh
7.	Power Spectral estimation using Spectrum analyzer	2	Dr.V.Dinesh
8.	Modulation and Demodulation of Mobile signals using VSA tool.	2	Mr. Raghuraman Application Engineer Elmack Engg Services Pvt.Ltd
9.	Design and analyze of microstrip line	2	Dr.V.Dinesh/ Dr.J.Vijayalakshmi
10.	Design and analyze Power divider, coupler and mixer	2	Dr.V.Dinesh/ Dr.J.Vijayalakshmi
11.	Design and analyze rectangular waveguide.	2	Dr.V.Dinesh/ Dr.J.Vijayalakshmi
12.	Design and analyze horn antenna	2	Dr.V.Dinesh/ Dr.J.Vijayalakshmi
13.	Design and analyze reconfigurable antenna	2	Dr.V.Dinesh/ Dr.J.Vijayalakshmi
14.	Principles of doppler shift in radar communications and measurement of speed, rotation, contact less vibration using Radar..	2	Dr.V.Dinesh/ Dr.J.Vijayalakshmi
15.	Transmission and reception of video signal using satellite trainer kit.	2	Dr.V.Dinesh/ Dr.J.Vijayalakshmi

Course Coordinator

HoD/ECE

Dr. J. Vijayalakshmi.

Dr. V. Dinesh.

18VAC89 - INDUSTRIAL COMMUNICATION, STANDARDS AND MEASUREMENTS

L	T	P	Credit
1	0	2	1

Preamble To understand the characteristics of passive microwave components and antenna. To acquire knowledge in the industrial standards and measurements of RF equipment's, satellite and radar systems.

Unit - I RF circuits, Standards and Measurements & Satellite, Radar Communication 10

RF circuits, Standards and Measurements : Introduction to RF communication- transmission systems -standards- Performance evaluation of RF communication systems- - Troubleshooting-RF communication systems- Calibration of industrial RF equipments- Introduction to Impedance matching techniques. Satellite, Radar Communication: Principles of doppler shift in radar communications.

List of Exercises / Experiments:

1. Power Spectral estimation using Spectrum analyzer
2. Modulation and Demodulation of Mobile signals using VSA tool.
3. Design and analyze of Microstrip line.
4. Design and analyze of Power divider and coupler
5. Design and analyze of mixer.
6. Design and analyze of Rectangular waveguide.
7. Design and analyze of Horn antenna
8. Design and analyze of Reconfigurable antenna.
9. Measurement of speed, rotation, contact less vibration using Radar.
10. Transmission and reception of video signal using Satellite trainer kit.

Lecture:10 , Practical:20 , Total:30

REFERENCES:

1. David M. Pozar, "Microwave Engineering – Theory and Techniques", 1st Edition, Wiley (Higher Education), New Delhi, India 2020.
2. www.radar-tutorial.eu/index.en.html
3. VSA Tool

COURSE OUTCOMES:

On completion of the course, the students will be able to

		BT Mapped (Highest Level)
CO1	calibrate and troubleshoot the industrial RF communication systems and summarize the knowledge of the satellite and radar communication principles.	Understanding (K2)
CO2	evaluate and test the performance of RF equipments and standards	Applying (K3), Precision (S3)
CO3	analyze the performance of RF circuits and antenna for wireless communication	Analyzing (K4), Precision (S3)

Mapping of COs with POs and PSOs

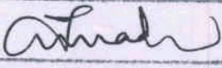
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	1	2		1	1		1	2	1	2	2
CO2	3	3	1	2	2	1		2		1	2	1	2	2
CO3	3	2	3	3	3	1	1		2	1	2	1	2	2

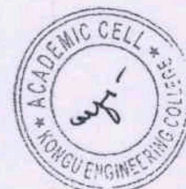
1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
Objective Questions (50 Marks)	20	30	20	30			100
Laboratory Assessment (50 Marks)		20	50	30			100

19/4


 Signature of the Chairman
 Head of Studies - **ECE**



Kongu Engineering College, Perundurai, Erode-638060.
Department of ECE
One credit course on Industrial Communication Standard and Measurements
List of Participants

Contact 9894577815
9659343425

Course Coordinator Dr. V Dinesh
Dr. J Vijayalakshmi

S.No	Roll No	Name of the Student	18-04-2022	21-04-2022	25-04-2022	29-04-2022	04-05-2022	10-05-2022	21-05-2022	31-05-2022	26-05-2022	27-05-2022	28-05-2022						19-06-2022	Present hours	Absent	Total present	Attendance percentage
1	19ECR020	BARATH RAJ S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30			
2	19ECR066	JAYASUDHA K	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	26	4	30	86.67
3	19ECR088	KRISHNA N	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	26	2	28	86.67
4	19ECR093	LOGESH P	A	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28	2	30	93.33
5	19ECR105	MOHAMMAD SHAMUDDH J	A	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	0	30	30	100.00
6	19ECR104	MOHAMMAD ASFAQ M	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	26	4	30	86.67
7	19ECR111	NANDHINI S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	0	30	100.00
8	19ECR112	NANDHINI R	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28	2	30	93.33
9	19ECR113	NANTIAKUMARAN S	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28	2	30	93.33
10	19ECR114	NAVTEEN M	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	0	30	100.00
11	19ECR116	NAVEENA PRIYA M	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	0	30	100.00
12	19ECR118	NIRMAL RAJ	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	26	4	30	86.67
13	19ECR124	POOJA V G	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	24	6	30	80.00
14	19ECR125	POOVENTHAN D	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28	2	30	93.33
15	19ECR133	RAGUL R	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28	2	30	93.33
16	19ECR135	RAJA KUMARAN R	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	22	2	24	73.33
17	19ECR136	RAJESH R	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	24	6	30	80.00
18	19ECR139	RAMYA T	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	10	0	30	100.00
19	19ECR140	RANJITH R	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	26	4	30	86.67
20	19ECR141	RAVI KUMAR P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	0	30	100.00
21	19ECR142	RITHIKA S	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28	2	30	93.33
22	19ECR144	RIYAZUR RAZAK N	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28	2	30	93.33
23	19ECR145	ROHITH M P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28	2	30	93.33
24	19ECR146	ROHIT KUMAR P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	24	6	30	80.00
25	19ECR148	RUBINI T	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	26	4	30	86.67
26	19ECR151	SAHASRA V	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	26	4	30	86.67
27	19ECR152	SANDEEP P K	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	26	4	30	86.67
28	19ECR155	SANJAI R	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	26	4	30	86.67
29	19ECR158	SANJAY E	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28	2	30	93.33
30	19ECR159	SANJAY R	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	24	6	30	80.00
31	19ECR161	SANJITH KUMAR S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28	2	30	93.33
32	19ECR165	SARAN V T	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	26	4	30	86.67
33	19ECR166	SARAN KUMAR N	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	0	30	100.00
34	19ECR205	THARANIDHARAN	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28	2	30	93.33
35	19ECR206	THARUNISH P S S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	26	4	30	86.67

Signature

KONGU ENGINEERING COLLEGE, PERUNDURAI – 638060
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

One credit course on **Industrial Communication, Standards and Measurements**

Duration: 21.06.2022

Class: III ECE

Total No of Hours conducted: 30

Mark Sheet

S.No.	Roll Number	Name of the participant	MCQs Test (50 marks)	Test - Simulation (50 marks)	Mark out of 100
1	19ECR020	BARATH RAJ S	42	48	90
2	19ECR066	JAYASUDHA K	38	45	83
3	19ECR088	KRISHNA N	34	46	80
4	19ECR093	LOGESH P	ABSENT		
5	19ECR104	MOHAMMAD SHAHID H J	38	45	83
6	19ECR105	MOHAMMAD ASFAQ M	ABSENT		
7	19ECR111	NANDHINI S	36	46	82
8	19ECR112	NANDHINI R	36	45	81
9	19ECR113	NANTHAKUMARAN S	42	48	90
10	19ECR114	NAVEEN M	24	46	70
11	19ECR116	NAVEENA PRIYA M	38	45	83
12	19ECR118	NIRMAL RAJ	34	40	74
13	19ECR124	POOJA V G	40	46	86
14	19ECR125	POOVENTHAN D	34	46	80
15	19ECR133	RAGUL R	32	42	74
16	19ECR135	RAJA KUMARAN R	34	45	79
17	19ECR136	RAJESH R	38	45	83
18	19ECR139	RAMYA T	40	47	87
19	19ECR140	RANJITH R	38	45	83
20	19ECR141	RAVI KUMAR P	34	45	79
21	19ECR142	RITHIKA S	42	46	88
22	19ECR144	RIYAZUR RAZAK N	36	45	81
23	19ECR145	ROHINTH M P	42	45	87
24	19ECR146	ROHIT KUMAR P	30	45	75
25	19ECR148	RUBINI T	42	45	87
26	19ECR151	SAHASRA V	42	46	88
27	19ECR152	SANDEEP P K	36	44	80
28	19ECR155	SANJAI R	36	45	81
29	19ECR158	SANJAY E	34	44	78
30	19ECR159	SANJAY R	30	45	75
31	19ECR161	SANJITH KUMAR S	32	44	76
32	19ECR165	SARAN V T	42	45	87
33	19ECR166	SARAN KUMAR N	36	40	76
34	19ECR205	THARANIDHARAN	38	46	84
35	19ECR206	THARUNISH P S S	32	45	77


 Coordinator 24/6/22


 HOD/ECE 24/6/22