

## Permission Letter

From

P.Sivasankar Rajamani,  
Associate Professor,  
Department of ECE,  
K.S.R College of Engineering,  
Tiruchengode-637 215.

Date: 4.2.2020

Place: Tiruchengode.

To

The Principal,  
K.S.R College of Engineering,  
Tiruchengode-637 215.

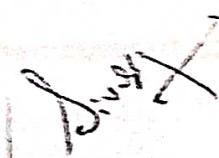
Respected Sir,

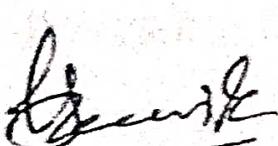
Submitted to the principal

Sub: Requisition to conduct Guest Lecture-Reg

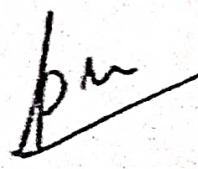
The ECE department has planned to conduct Guest Lecture on "Satellite Communication Systems" on 5.2. 2020.so we request you to grant permission to conduct the guest lecture on scheduled time.

Thanking You,

  
Yours sincerely,



HOD/ECE

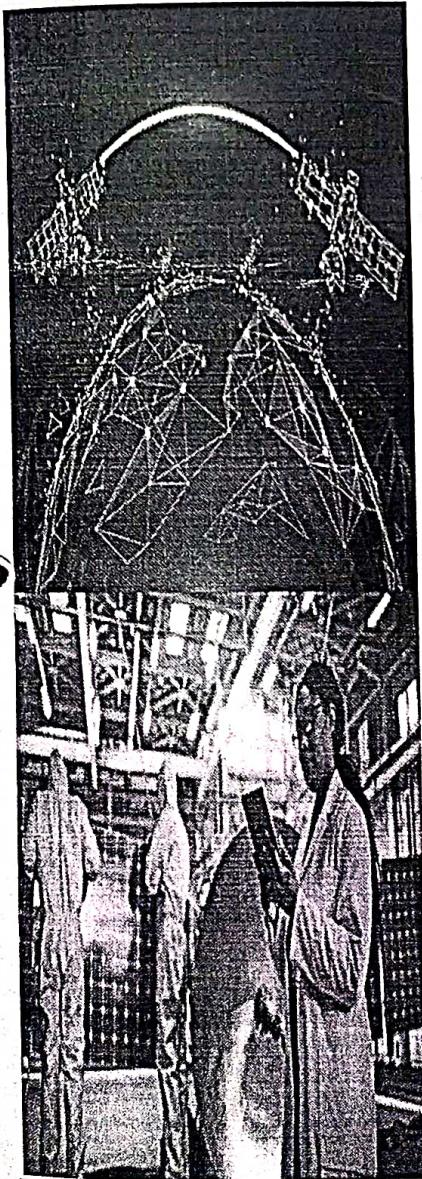
  
Principal

**K.S.R COLLEGE OF ENGINEERIG, TIRUCHENGODE**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**GUEST LECTURE ON “SATELLITE COMMUNICATION SYSTEMS”**

**GUEST LECTURE REPORT**

**Information Boucher**



Lion Dr.K.S.Rangasamy,MJF  
Founder chairman



Mr.R.Srinivasan B.B.M  
Vice - Chairman,KSREI

**K.S.R. College of Engineering (Autonomous)  
Tiruchengode – 637 215**

**Department of ECE**

**Guest Lecture**

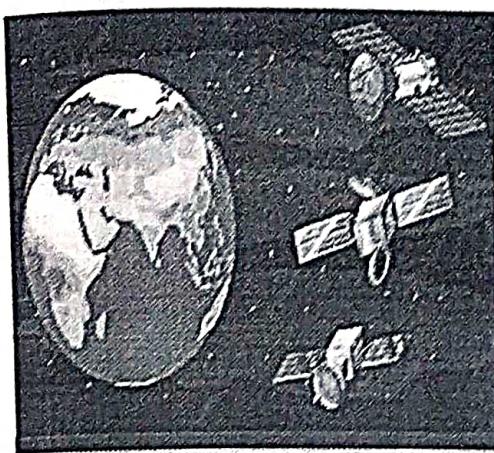
**Satellite Communication Systems**

**Dr.Mahendrakumar.S  
Professor,ECE Department,  
Vellalar College of Engineering  
and Technology,Thindal.**



Online Mode  
Date : 05.02.2020  
Time : 10.30 PM

Google Meet Link : <https://meet.google.com/mse-omar-wnw>



KSR COLLEGE OF ENGINEERING  
(AUTONOMOUS)

GUEST LECTURE

## Satellite Communication System

Online mode  
Date:05.02.2020  
Time:1030 am

Google Meet Link:  
<https://meet.google.com/mse-omar-wnw>

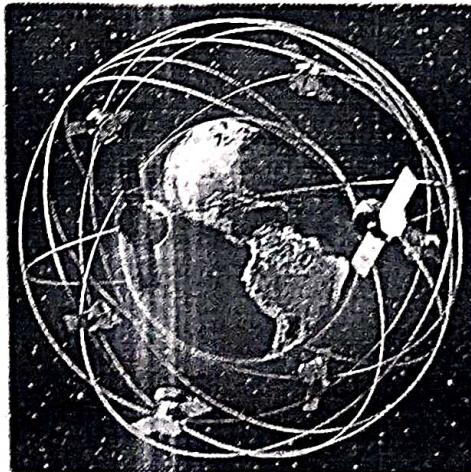


Dr.MAHENDRAKUMAR S

Professor, ECE department,  
Velalar college of Engineering and  
Technology, Thindal.

## Outline

- Introduction
- Orbits and Related Issues
- Frequency Band Selection
- System Composition
- Satellite Channel
- Conclusion



- Service scope is wide
- Communication quality is good
- Not restricted by geographical conditions
- Wide available bandwidth
- Large communication capacity
- Independent of the ground communication
- Network routing is simple.
- Network construction is fast and low cost.
- Secure communication.
- Communication costs are independent of communication distance.



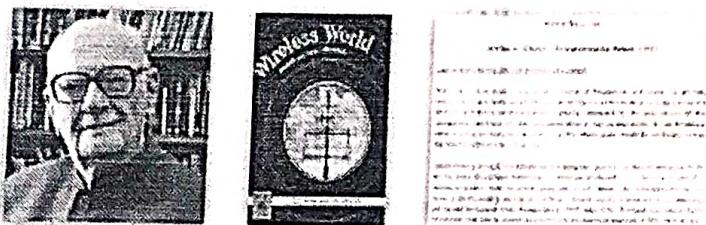
- Launch and control technology is complex
- Propagation delay is large
- Affected by outer space



## Development

UNIVERSITY OF HOUSTON  
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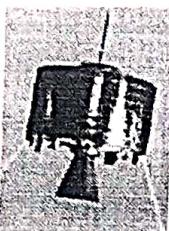
- The idea of satellite communications was first proposed by British Air Force officer Arthur C. Clarke (science fiction writer) in the "Wireless World" magazine "Extra-Terrestrial Relays" (1945).



## Development

UNIVERSITY OF HOUSTON  
COLLEGE OF ENGINEERING

- Syncom 3: first truly geosynchronous orbit satellite
- TELESTAR-1: LEO satellite laid the technical foundation for commercial satellite communications
- The US launched the "Skynet" broadcast test satellite for the transmission of tape recording signals
- The US launched the "Echo" (ECHO) satellite, the first completed active delay relay communications satellite
- The former Soviet Union launched the world's first artificial earth satellite, Sputnik 1



## Development

UNIVERSITY OF HOUSTON  
COLLEGE OF ENGINEERING

- International Telecommunications Satellite Organization launched the "Intelsat 1" in April 1965, which is the world's first practical geosynchronous orbit satellite and marks the beginning of the practical phase of satellite communications.

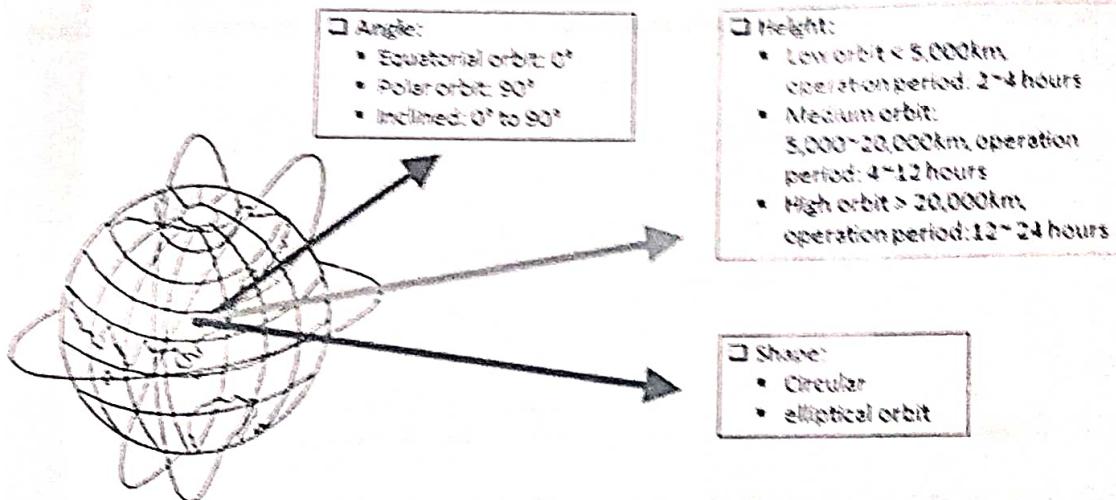


- For more than 50 years, satellite communications have developed rapidly:
- Satellite weights: tens of kilograms → more than 5,000 kilograms.
  - Life spans: 1.5 years → more than 15 years.
  - Communication capacity: 480 tones → tens of thousands of tones.
  - Traffic: TV, data, multimedia services.



## v.s. Cell

# Orbits



# Channel

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**HOUSTON**  
CIVIL COLLEGE OF ENGINEERING

- Outside the ionosphere -> free space propagation
- Propagation in the atmosphere can be corrected on free space propagation.
- Except satellite mobile channel, the satellite channel between the satellite and earth station can be considered as a constant channel.
- The radio waves are subject to loss in propagation atmosphere, rain, clouds, snow, fog, etc.

- Satellite mobile communications (between NGEO satellite and mobile users) use lower communication frequencies and (semi) omnidirectional antennas, so as with ground mobile communications, there are multipath and shadow occlusions, which are fading channels.
- Because the fixed earth station uses a directional antenna, the operating frequency is high, and the occlusion can be avoided, the satellite channel between the earth station and satellite can be regarded as a Gaussian white noise channel at this time.

# Frequency

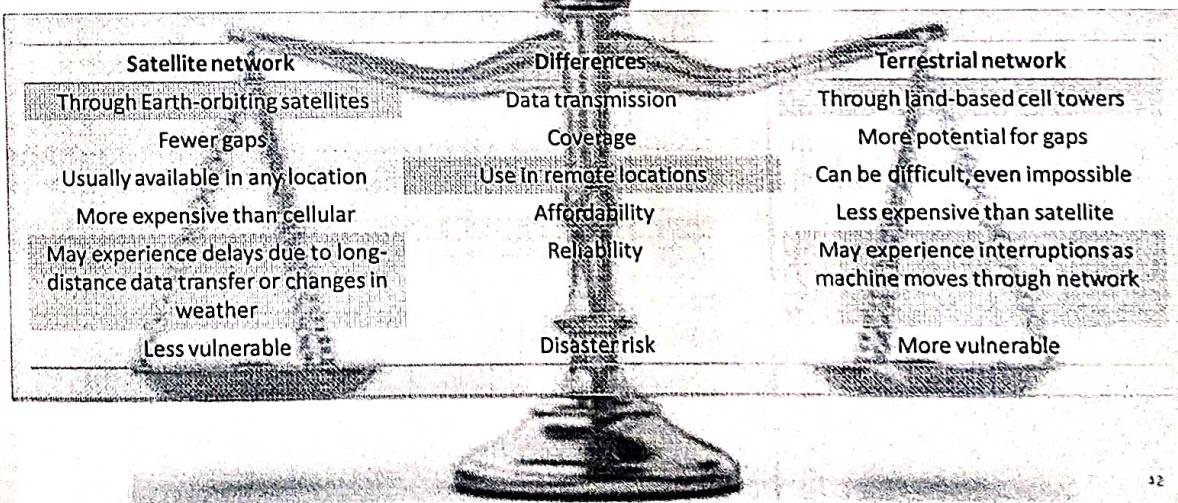
## Satellite communication band (microwave)

Frequency	Range(GHz)	Frequency	Range(GHz)
UHF	0.3~1.12	Ku	12.4~18
L	1.12~2.6	K	18~26.5
S	2.6~3.95	Ka	26.5~40
C	3.95~8.2	Millimeter wave	40~300
X	8.2~12.4		

## Frequency allocation

- The ITU divides the world into three regions:
  - Region 1: Europe, Africa, the Middle East and some countries of the former Soviet Union;
  - Region 2: America;
  - Region 3: In addition to the Asian region of the Middle East and some countries of the former Soviet Union and Oceania

# Conclusion



10:30 0 0

14:00 0 0 0 0 0

← About this call

People

Information

Share joining information

Search for someone in this call

In call

Salamudeen KS (You)

Dr.S.Mahendrakumar (pre...)

011 MONISHA S

015 Pooja priyadhars...

021 SIVA U

024 Sudharsan V T

Guna T

kaviya A-ECE- KSRCE

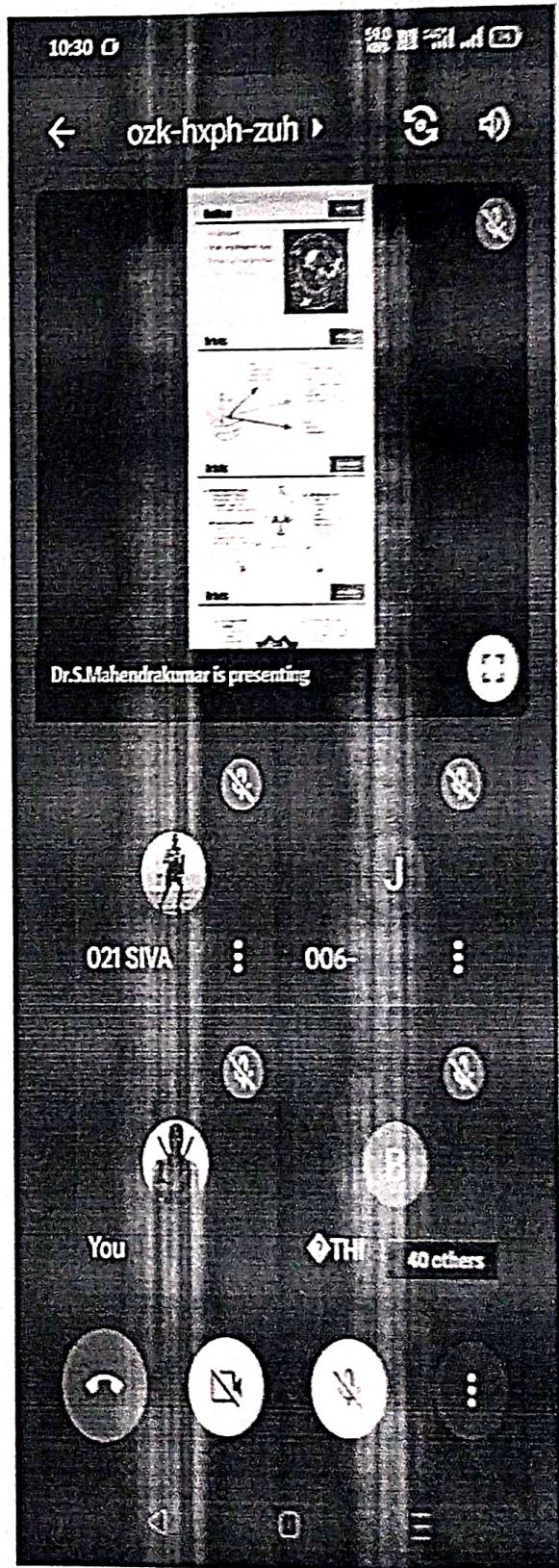
Keerthana S

PAVITHRAN S

Pooja P

SRIDHARAN P BE ECE...

◆ GANGAA SRI S BE ...



**K.S.R. COLLEGE OF ENGINEERING (AUTONOMOUS), TIRUCHENGODE -637215**

**DEPARTMENT OF ECE**

**Impact Analysis on Guest Lecture “Satellite Communication Systems”**

Department of Electronics and Communication Engineering had organized Guest Lecture on “Satellite Communication Systems” on 5<sup>th</sup> february 2020 through online mode.

The guest lecture began with welcome address by the Head of the Department, ECE Dr.P.S.Periasamy. He introduced and welcomed Dr.S.Mahendrakumar,Professor,velalar college of Engineering and Technology,Thindal, resource person to deliver the lecture. The lecture was attended by 40 students and 5 Faculty members of ECE department.

The guest speaker Dr.S.Mahendrakumar focused on satellite applications for earth observation, navigation, space exploration and communications.

The session ended with hearty thanks by P.Sivasankar to Resource persons and participants. He thanked the Management for providing the platform to organize guest lecture on innovative technologies.

Satellite Applications for Earth observation, navigation, Space exploration, and communications.

related to Communication subsystem design for small-satellites, emphasizing on Antenna Desing/simulation and Link Budget Analysis.

**K.S.R.COLLEGE OF ENGINEERING (AUTONOMOUS), TIRUCHENGODE -637215**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**Impact Analysis on Guest Lecture**

**From Participant's Feedback**

S.No	Parameter to be Analyzed	Number of Participants			
		Extremely Good	Good	Quite Good	Poor
1.	Helpful of the guest lecture	20	15	6	-
2.	Overall Organization of the Guest lecture	25	10	6	-
3.	Usefulness of the guest lecture from the Knowledge and subject point of view	10	20	10	1
4.	General suggestions/comments to improve the guest lecture	25	5	5	6

- The guest lecture was very informative that the faculties and students learnt about Satellite Communication Systems. It was wonderful for sharing and gaining knowledge related to Communication subsystem design for small-satellites, emphasizing on Antenna Designing/simulation and Link Budget Analysis. The lecture was even more interesting with the real time examples.

**Impacts:**

- This guest lecture helped the faculties and students to improve their knowledge on the field of Satellite Communication Systems and the students may have the opportunity to participate in more workshops that have taken place under various topics on Satellite Communication Systems, held at various other colleges.
- The Students may also be insisted to publish many articles on solving real life challenges and issues using satellite communication systems.
- The guest lecture has also motivated the students to do more projects in Satellite Communication Systems.

Impacts on Programme Outcomes:

**PO1-Engineering Knowledge:**

This Guest Lecture apply knowledge of mathematics, science and engineering fundamentals to solve problems in the domain of electronics and Communication Engineering.

**PSO1 - Design/development of solutions:**

This guest lecture helps to design and develop models for signal processing and communication systems.

**PO10 – Project Management and finance:**

This guest lecture helps to communicate facts successfully with people in engineering domain and effectively design and prepare documents and reports.

**PO12-Life-long Learning:**

This guest lecture acquire knowledge of contemporary issues and recognize the need for lifelong learning.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous), TIRUCHENGODE-637215**

**DEPARTMENT OF ELECTRONICS COMMUNICATION AND ENGINEERING**

***GUEST LECTURE on "SATELLITE COMMUNICATION SYSTEMS"***

**DATE -05.02.2020 PARTICIPATION LIST**

S.No	Email Address	Full Name	Designation	Institution Name	Overall, How would you rate the events ?	Any other Comments
1.	arun915426@gmail.com	ARUNPRAKASH D	Student	K.S.R.College of Engineering	Excellent	Super
2.	dhayanithi1829@gmail.com	DHAYANITHI G	Student	K.S.R.College of Engineering	Very Good	Nil
3.	sangaasri10@gmail.com	GANGAA SRI.S	Student	K.S.R.College of Engineering	Excellent	Nice session
4.	sindhugopika2651@gmail.com	GOPIKA.V	Student	K.S.R.College of Engineering	Excellent	Good
5.	jonishamurugan2000@gmail.com	JONISHA.M	Student	K.S.R.College of Engineering	Good	Thought provoking session
6.	Karthimaker848992@gmail.com	KARTHIKEYAN K	Student	K.S.R.College of Engineering	Very Good	Nil
7.	nkaviya28@gmail.com	KAVIYA A	Student	K.S.R.College of Engineering	Good	Thanks for the session
8.	keerthisubramaniam1810@gmail.com	KEERTHANA S	Student	K.S.R.College of Engineering	Very Good	Want clear Q&A section
9.	smonishank12002@gmail.com	MONISHA.S	Student	K.S.R.College of Engineering	Excellent	Very nice session
10.	narmada915426@gmail.com	NARMADHA.E	Student	K.S.R.College of Engineering	Very Good	Need this topic guest lecture in another session

11.	niveprabu19@gmail.com	NIVETHA P	Student	K.S.R.College of Engineering	Excellent	Nothing
12.	poogasumathi19@gmail.com	POOJAP	Student	K.S.R.College of Engineering	Excellent	Good
13.	tpoojapriyadharshini@gmail.com	POOJA PRIYADHARSHINI R	Student	K.S.R.College of Engineering	Good	No
14.	kssalamudeen@gmail.com	SALAMUDEEN K S	Student	K.S.R.College of Engineering	Good	Nice
15.	saren982001@gmail.com	SARAN. M	Student	K.S.R.College of Engineering	Excellent	Very nice session and is very informative..
16.	vsaravananvijay246@gmail.com	SARAVANAN. V	Student	K.S.R.College of Engineering	Excellent	Nil
17.	s.selvakumaregv@gmail.com	SELVAKUMAR.S	Student	K.S.R.College of Engineering	Excellent	Useful session
18.	senthilkaasi3101@gmail.com	SENTHIL KAASI .R	Student	K.S.R.College of Engineering	Very Good	Informative session
19.	Sivarohit456@gmail.com	SIVA.U	Student	K.S.R.College of Engineering	Very Good	Very informative session.
20.	srivanan10@gmail.com	SRIVANAN.K	Student	K.S.R.College of Engineering	Excellent	Excellent session
21.	sudharsany2000@gmail.com	SUDHARSAN.V.T	Student	K.S.R.College of Engineering	Excellent	Useful session
22.	sunyaprakash1005@gmail.com	SURYAPRAKASH R	Student	K.S.R College of Engineering	Excellent	Good
23.	swethag3621@gmail.com	SWETHA.G	Student	K.S.R.College of Engineering	Excellent	Nice session
24.	thirunavijay594@gmail.com	THIRUNAVUKKARASU.M	Student	K.S.R.College of Engineering	Good	More informative
25.	vickyvijay516@gmail.com	VIGNESHWARAM.S.	Student	K.S.R College of Engineering	Excellent	Good session
26.	vijayalakshmi9898@gmail.com	VIJAYALAKSHMI G	Student	K.S.R.College of Engineering	Very Good	No comments
27.	balas3166568@gmail.com	BALAMURALIDHARAN.K.R	Student	K.S.R.College of Engineering	Excellent	No

28.	<u>boobalan809840404@gmail.com</u>	BOOBALAN A	K.S.R.College of Engineering	Excellent	Very useful and informative session
29.	<u>deepakjohn112000@gmail.com</u>	DEEPAK. K	K.S.R.College of Engineering	Excellent	Ni
30.	<u>gunati1101@gmail.com</u>	GUNA T	K.S.R.College of Engineering	Very Good	Useful session
31.	<u>hanitharan.ravichanderan@gmail.com</u>	HARIHARAN.R	K.S.R.College of Engineering	Very Good	Informative session
32.	<u>hindhushaamutha@gmail.com</u>	HINDHUSHA.S	K.S.R.College of Engineering	Very Good	Very informative session
33.	<u>jeevaramadesh18@gmail.com</u>	JEEVANANTHAM.M	K.S.R.College of Engineering	Excellent	Excellent session
34.	<u>kavinraj1357@gmail.com</u>	KAVIN RAJ.K.L	K.S.R.College of Engineering	Excellent	Useful session
35.	<u>navithranvakumar3@gmail.com</u>	PAVITHRAN S	K.S.R.College of Engineering	Good	Good
36.	<u>praveenkumar75611@gmail.com</u>	PRAVEEN KUMAR.D	K.S.R.College of Engineering	Excellent	Nice session
37.	<u>sanjayskeee18@gmail.com</u>	SANJAY KUMAR N A	K.S.R.College of Engineering	Good	More informative
38.	<u>srisanth.7143@gmail.com</u>	SARAN.S	K.S.R.College of Engineering	Excellent	Good session
39.	<u>lovelysurya8055@gmail.com</u>	SIVA AEHISHEK.R	K.S.R.College of Engineering	Very Good	No comments
40.	<u>suryasivakumar326@gmail.com</u>	SRIDHARAN P	K.S.R.College of Engineering	Excellent	No