



**K.S. INSTITUTE OF TECHNOLOGY, BANGALORE - 560109**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**  
**TEACHING AND LEARNING**

**Details of Content beyond syllabus Activities-2023-24 (EVEN)**

**8<sup>th</sup> Semester**

<b>Semester/ Section</b>	<b>Course Name</b>	<b>Content beyond syllabus activity conducted</b>	<b>POs Covered</b>	<b>Faculty</b>	<b>Number of Activity</b>
VIII A &B	Wireless and Cellular Communication- 18EC81	Poster Presentation	1,2,5,9,10,12	Dr. P N Sudha Mrs. Suma Santhosh	29
VIII A	Radar Engineering- 18EC823	Poster Presentation	5,9,10,12	Dr. Saleem S Tevaramani	11
VIII B	Radar Engineering- 18EC823	Poster Presentation	5,9,10,12	Dr. Dinesh Kumar D S	13



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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**  
**TEACHING AND LEARNING**  
**CONTENT BEYOND SYLLABUS**

<b>Academic Year</b>	<b>2023-24 (Even)</b>
<b>Name of the Faculty</b>	<b>Dr. P N Sudha/ Suma Santosh</b>
<b>Course Name /Code</b>	<b>Wireless and Cellular Communication/18EC81</b>
<b>Semester/Section</b>	<b>VIII/A &amp;B</b>
<b>Activity Name</b>	<b>Poster Presentation</b>
<b>Topic Covered</b>	<b>Wireless comparison ,Applications and Beyond 4G</b>
<b>Date</b>	<b>16/4/2024 to 24/4/2024</b>
<b>No. of Participants</b>	<b>112 students (29 Teams)</b>
<b>Objectives/Goals</b>	<ul style="list-style-type: none"><li>• To apply the knowledge on different communication applications.</li><li>• To improve the self-learning skills of students</li><li>• To improve the communication skills of students.</li><li>• To improve the ICT usage skills of students</li></ul>
<b>ICT Used</b>	<b>Laptop</b>
<b>Appropriate Method/Instructional materials/Exam Questions</b> <ul style="list-style-type: none"><li>• Assigned all the topics to students.</li><li>• Students were asked to give poster presentation on topic of their interest from the given topics, and submitted their poster presentation.</li><li>• Students are given with additional information/sources from their selected topics.</li><li>• Title of the Poster Presentation as follows:<ul style="list-style-type: none"><li>• Comparison of 4G &amp; 5G wireless Technology</li><li>• Role of wireless communication in Health care systems</li><li>• Wireless in unmanned aerial vehicles</li><li>• Evolution in Wireless communication</li><li>• Wireless LAN</li><li>• Future wireless networks</li><li>• Wonders of Wireless</li><li>• Heterogeneous wireless communication world</li><li>• Cognitive Computing &amp; wireless communication on the edge of Health care</li><li>• 5G Advantages &amp; disadvantages</li></ul></li></ul>	
<b>Relevant PO's</b>	<b>1,2,5,9,10,12</b>
<b>Significance of Results/Outcomes</b>	<ul style="list-style-type: none"><li>• Students improved their Poster making and communication skills.</li><li>• Students were divided into teams as maximum 4 in a team.</li></ul>
<b>Reflective Critique</b>	<ul style="list-style-type: none"><li>• The activity improved the learning and communication skills of students.</li><li>• The activity provided a platform for students to apply their knowledge on different fields in wireless communication and improve their communication skills and work as Individuals.</li></ul>



Batch	USN	NAME	Title
T-1	1KS20EC002	Aditi Dubey	Wireless in unmanned aerial vehicles
	1KS20EC030	Gandhamani CM	
	1KS20EC035	Harshitha J	
	1KS20EC057	Meghashree M	
T-2	1KS20EC010	Bhavitha .B	Role of wireless communication in Health care systems
	1KS20EC023	Dhamini .J	
	1KS20EC025	Divya.N	
	1KS20EC038	Jampula chaithanya	
T-3	1KS19EC026	Eram fathima	Comparison of 4G & 5G wireless Technology
	1KS20EC003	Afeefa Sharieff	
	1KS20EC054	Madiha	
T-4	1KS20EC034	Harshitha B L	Evolution in Wireless communication
	1KS20EC036	Harshitha N	
	1KS20EC042	K Jeevitha	
	1KS20EC046	Kavya S M	
T-5	1KS20EC024	Dhruva Kumar S	Wireless LAN
	1KS20EC028	Gagan HC	
	1KS20EC033	Harshith Gowda AR	
	1KS20EC041	Jayanth H	
T-6	1KS20EC029	Gagana B S	Future wireless networks
	1KS20EC037	Inchara P	
	1KS20EC045	Kavana G S	
T-7	1KS20EC043	K. M Amshumanth	Wonders of Wireless
	1KS20EC049	Kiran V Narayn	
	1KS20EC051	Kumar. K. G	
	1KS20EC058	Mohan Krishna	
T-8	1KS20EC006	Akash.M	Role of wireless communication in Health care systems
	1KS20EC004	Ajay B.G	
	1KS20EC021	Darshan Kumar S	
	1KS20EC012	Chaithanya Reddy	
T-9	1KS20EC016	Chaya S	Comparison of 4G & 5G wireless Technology
	1KS20EC027	G Bhavana Priyadarshini	
	1KS20EC031	Gomitha R C	
	1KS20EC032	Harini k	
T-10	1KS20EC026	Eshwar Biradar	5G Advantages & disadvantages
	1KS20EC048	Kiran Dev D	
	1KS20EC052	Kusuma VR	
	1KS20EC055	Mahesh Biradar	



T-11	1KS20EC001	Abhishek J	Wireless in unmanned aerial vehicles
	1KS20EC017	Chethan G	
	1KS20EC018	Chethan Kumar J	
	1KS20EC019	Chethan Kumar T	
T-12	1KS19EC034	Hima Swetha S	Cognitive Computing & wireless communication on the edge of Health care
	1KS20EC008	B S Hemashree	
	1KS20EC011	Bhuvaneshwari K	
	1KS20EC013	Chaithra K	
T-13	1KS20EC014	C. Sai Srujitha	Evolution in Wireless communication
	1KS20EC047	Keerthana B S	
	1KS20EC050	Kodidela Prathima	
	1KS20EC053	M. Archana	
T-14	1KS20EC015	challagunnla Umadevi	Wireless LAN
	1KS20EC039	JAMUNA S G	
	1KS20EC040	JANHAVI R	
	1KS20EC056	MANASWINI K M	
T-15	1KS20EC009	BHARATH M	Future wireless networks
	1KS20EC020	DARSHAN K	
	1KS20EC070	PRIYANKA K	
	1KS20EC069	PRIYANKA.H C	
T-16	1KS20EC083	S ARUN KUMAR	Wonders of Wireless
	1KS20EC079	RAMESHWAR	
	1KS20EC089	SANJANA G	
	1KS20EC091	SANJANA T GADIKAR	
T-17	1KS20EC060	Nallani Gowthami	Wireless RF Technology for the IoT
	1KS20EC111	Vaishnavi V H	
	1KS20EC113	Vijayalakshmi K	
	1KS20EC117	Yashilaa S	
T-18	1KS20EC077	RAKSHITH R	Wireless in unmanned aerial vehicles
	1KS20EC093	Sharath M	
	1KS20EC098	Shreyas P S Rao	
	1KS20EC108	Uday C H	
T-19	1KS20EC062	NEHA NAGARAJ AIRANI	Wireless charging vs.Wired charging of Electronic Devices
	1KS20EC080	RAMYA T	
	1KS20EC112	VARSHA N	
T-20	1KS20EC061	Neha CR	Wireless RF Technology for the IoT
	1KS20EC065	Pavani TS	
	1KS20EC071	Priyanka M	
	1KS20EC072	Pushpa DT	
T-21	1KS20EC096	SHREYA H P	heterogeneous wireless communication world
	1KS20EC099	Shweta Deepak	
	1KS20EC102	Sumana N	
	1KS20EC110	Vaishnavi A	



T-22	1KS20EC084	Sachin N M	Comparison of 4G & 5G wireless Technology
	1KS20EC087	Sandeep Y H	
	1KS20EC109	Ujjwal Naidu	
	1KS20EC114	Vinay S P	
T-23	1KS20EC063	vasanth Kumar	Wireless in unmanned aerial vehicles
	1KS20EC064	pavan c	
	1KS20EC067	Praveen db	
	1KS20EC107	T.Girish Chowdary	
T-24	1KS20EC073	RAHUL KRISHNAN V	Evolution in Wireless communication
	1KS20EC103	SUMUKHA S	
	1KS20EC105	TARUN PRASANNA	
	1KS20EC106	TEJAS N REDDY	
T-25	1KS20EC066	PRADHYUMNA S KASHYAP	Future wireless networks
	1KS20EC075	RAJATH K ACHAR	
	1KS20EC116	VINEETH M S	
	1KS20EC118	YASHWANTH Y	
T-26	1KS20EC074	RAHUL R	Wonders of Wireless
	1KS20EC078	RAKSHITHA A	
	1KS20EC085	SADHANA SRINIVAS	
	1KS20EC115	VINAY SAGAR V ALUR	
T-27	1KS20EC076	RAKSHITH.N.M	Heterogeneous wireless communication world
	1KS20EC082	ROHITH A K	
	1KS21EC401	SUDEEP V	
T-28	1KS20EC059	N SHREYA	Role of wireless communication in Health care systems
	1KS20EC068	PREMA G	
	1KS20EC101	SONIKA.R	
	1KS20EC104	SURAKSHA N	
T-29	1KS20EC092	SHAKTHI ANBAZHAGAN M	Comparison of 4G & 5G wireless Technology
	1KS20EC094	SHASHANK S	
	1KS20EC095	SHIVAREDDY B A	
	1KS20EC097	SHREYAS M S	





**CONTENT BEYOND SYLLABUS ACTIVITY**  
 ON  
**"HETEROGENEOUS WIRELESS COMMUNICATION WORLD"**

Topic No: 21

Submitted by  
 BIRNVA U  
 SHWETA DEKPAK  
 SURALINA N  
 VAIBHAWYA

ICR10010096  
 ICR10010099  
 ICR10010102  
 ICR10010110

Submitted in partial fulfillment of  
 Wireless and Cellular Communication - I (BCE21)

**ASSIGNMENT**



**K. S. INSTITUTE OF TECHNOLOGY**  
 #14, Bagalurbanahalli, Kankapura Main Road,  
 Bangalore - 560109

**K.S. INSTITUTE OF TECHNOLOGY**  
 No.14, Bagalurbanahalli, Kankapura Road, Bangalore-560109

**HETEROGENEOUS WIRELESS COMMUNICATION WORLD**  
 Subject: Wireless and Cellular Communication  
 Subject Code: IBCCE21

In our increasingly interconnected world, the demand for seamless and reliable wireless communication has surged across various sectors. From smart cities to industrial automation and from emergency services to the adoption of 5G, the landscape of wireless communication is rapidly evolving. This assignment explores the challenges and opportunities in this dynamic field.

The assignment explores the challenges and opportunities in this dynamic field. It discusses the integration of multiple wireless technologies within a unified framework. This integration enables the creation of heterogeneous networks (Hetero-Nets) that leverage the strengths of different wireless technologies to optimize coverage, capacity, and quality of service (QoS) across diverse environments. For example, a cellular network might provide a primary service through a 4G/LTE network and be able to maintain connectivity when switching to a satellite network to ensure a wireless communication network.

Figure 1: Heterogeneous Wireless Communication World

Figure 2: Architecture of Hetero-Nets

Figure 3: Example for a Heterogeneous wireless communication



**Course Code: IBCCE21**  
**PRIMARY ACTIVITY**  
 of  
**"Wonders of Wireless"**

Presented by

KANISHK R  
 KANISHKA A  
 KANISHKA B  
 VENKATACHANDRAN

ICR10010111  
 ICR10010112  
 ICR10010113  
 ICR10010114

Submitted in partial fulfillment of  
 Wireless and Cellular Communication - I (BCE21)

**ASSIGNMENT 2**

2023-24



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 Bangalore - 560109


**WIRELESS AND CELLULAR COMMUNICATION**  
**Wonders of Wireless**

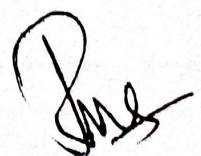
**Wireless Communication**

A wireless network is a network that does not require a physical connection between the nodes. It can be used for a variety of applications, from simple text messaging to complex data transfer. The most common type of wireless network is a cellular network, which is used for mobile telephony and data services. Other types of wireless networks include Wi-Fi, Bluetooth, and ZigBee.

Wireless communication has many advantages over wired communication. It is more flexible and can be used in a wide range of environments. It is also more secure and can be used for a variety of applications, from simple text messaging to complex data transfer. The most common type of wireless network is a cellular network, which is used for mobile telephony and data services. Other types of wireless networks include Wi-Fi, Bluetooth, and ZigBee.

Wireless communication has many advantages over wired communication. It is more flexible and can be used in a wide range of environments. It is also more secure and can be used for a variety of applications, from simple text messaging to complex data transfer. The most common type of wireless network is a cellular network, which is used for mobile telephony and data services. Other types of wireless networks include Wi-Fi, Bluetooth, and ZigBee.

  
 Signature of Course In-charge

  
 Signature of HOD-ECE





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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**  
**TEACHING AND LEARNING**  
**CONTENT BEYOND SYLLABUS**

<b>Academic Year</b>	2023-24 (Even)
<b>Name of the Faculty</b>	Saleem S Tevaramani
<b>Course Name /Code</b>	RADAR ENGINEERING/18EC823
<b>Semester/Section</b>	VIII/A
<b>Activity Name</b>	Poster Presentation
<b>Topic Covered</b>	All Modules
<b>Date</b>	20/4/2022 to 13/5/23
<b>No. of Participants</b>	56
<b>Objectives/Goals</b>	To improve the self-learning and presentation skills of students To improve the communication skills of students.
<b>ICT Used</b>	Laptop/System
<b>Appropriate Method/Instructional materials/Exam Questions</b>	
<ul style="list-style-type: none"><li>➤ Initially delivered lectures on Radar Engineering.</li><li>➤ Later students were formed into groups, assigned with a topic, asked to prepare A3 size poster, and give oral presentation.</li><li>➤ Students are given with additional information/ sources from which they can prepare.</li></ul>	
<b>Relevant PO's</b>	5,9,10,12
<b>Significance of Results/Outcomes</b>	<ul style="list-style-type: none"><li>➤ Students tried to explore the importance of radar engineering, improved their self-learning, communication, and team management skills as an individual and team member.</li><li>➤ Students submitted posters in a group of four, and delivered their presentation.</li></ul>
<b>Reflective Critique</b>	<ul style="list-style-type: none"><li>➤ The activity improved the self-learning of students.</li><li>➤ The activity provided a platform for students to interact with peers, improve their communication skills, and work as individuals and as team.</li></ul>



Team. No	USN	Name	Title
T-1	1KS20EC001	Abhishek J	MTI Signal Processor and Original MTD
	1KS20EC019	Chethan Kumar T	
	1KS20EC018	Chetan Kumar J	
	1KS20EC017	Chethan G	
T-2	1KS19EC026	Eram Fathima	Radar-Operation, Frequencies, Applications and Origin
	1KS20EC003	Afeefa Shariff	
	1KS20EC054	Madiha	
T-3	1KS19EC034	Hima shwetha S	Types of Radar Tracking Systems, Monopulse Tracking-Amplitude Comparison Monopulse(1D), Monopulse(2D), Phase Comparison Monopulse
	1KS20EC008	B.S Hemashree	
	1KS20EC011	Bhuvaneshwari	
	1KS20EC013	Chaithra K	
T-4	1KS20EC002	Aditi Dubey	Basics Concepts of Radar System and Definitions W.R.T Radar Waveform
	1KS20EC030	Gandamani C.M	
	1KS20EC035	Harshitha J	
	1KS20EC057	Megha shree M	
T-5	1KS20EC010	Bhavitha B	Peak Transmitter Power, Average Transmitter Power Simple form of Radar Equation & Radar Block Diagram
	1KS20EC023	Dhamini J	
	1KS20EC025	Divya N	
	1KS20EC038	J.Chaithanya Krishna	
T-6	1KS20EC014	C.Sai Sujitha	Electronically Steered Phase Array Antenna
	1KS20EC047	Keerthana B.S	
	1KS20EC050	K. Prathima	
	1KS20EC053	M. Archana	
T-7	1KS20EC016	Chaya S	MTI Signal Processor and Original MTD
	1KS20EC027	G.Bhavanapriyadrshini	
	1KS20EC031	Gomitha R.C	
	1KS20EC032	Harini K	
T-8	1KS20EC034	Harshitha B.L	Minimum Detectable Signal, Receiver Noise
	1KS20EC036	Harshitha N	
	1KS20EC042	Jeevitha K	
	1KS20EC046	Kavya S.M	
T-9	1KS20EC020	Darshan K	Simple Radar and its function
	1KS20EC029	Gagana B.S	
	1KS20EC037	Inchara P	
	1KS20EC045	Kavana G.S	
T-10	1KS20EC024	Dhruva Kumar S	Prediction of Radar Range Performance, Minimum Detectable Signal, Receiver Noise
	1KS20EC028	Gagan H.C	
	1KS20EC033	Harshitha Gowda A.R	



	1KS20EC041	Jayanth H	<b>Functions of the Radar Antenna</b>
<b>T-11</b>	1KS20EC015	C. Umadevi	
	1KS20EC039	Jamuna S.J	
	1KS20EC040	Janhavi R	
	1KS20EC056	Manaswini K.M	

**Proofs (Photographs/Videos/Reports/Charts/Models)**

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### DELAY LINE CANCELLERS

Delay line canceller is a filter, which eliminates the DC components of echo signals received from stationary targets. This means, it allows the AC components of echo signals received from non-stationary targets, i.e., moving targets.

**Types of Delay Line Cancellers**

Delay line cancellers can be classified into the following two types based on the number of delay lines that are present in it.

**Single Delay Line Cancellor**

The combination of a delay line and a subtractor is known as delay line canceller. It is also called single delay line canceller.

**Double Delay Line Cancellor**

We know that a single delay line canceller consists of a delay line and a subtractor. If two such delay line cancellers are cascaded together, then that combination is called Double delay line canceller. The block diagram of Double delay line canceller is shown in the following figure above.

### BLIND SPEEDS

The magnitude of the radial component of velocity of an object, i.e., a target, relative to a radar site, that cannot be measured by the radar unit. Note: Radar blind speeds occur because of the relationship between the transmitted pulse repetition rate (PRF) and the received pulse repetition rate.

**Blind Speed =  $\frac{\lambda}{2T_r}$**

$T_r$  = Pulse repetition time  
 $\lambda$  = Wavelength of EM Wave

**K.S. INSTITUTE OF TECHNOLOGY**  
CONTENT BEYOND SYLLABUS ACTIVITY: 18EC823  
TITLE: FUNCTIONS OF THE RADAR ANTENNA AND ITS PARAMETERS

**FUNCTION OF RADAR ANTENNA:** Radar antenna is a unit that transmits radio waves and receives the echoes of these radio waves. The performance of an antenna lies in its capability to detect the exact direction in which an object is

**ANTENNA PARAMETERS:** Typical parameters of antennas are gain, bandwidth, radiation pattern, beamwidth, polarization, and impedance. The antenna pattern is the response of the antenna to a plane wave incident from a given direction or the relative power density of the wave transmitted by the antenna in a given direction.

**PROPERTIES OF ANTENNA:**

- 1 Radiation Pattern.
- 2 Beamwidth.
- 3 Radiation Power Density.
- 4 Radiation Intensity.
- 5 Directivity.
- 6 Antenna Efficiency and Gain.
- 7 Polarization.

The basic principle behind radar is simple - extremely short bursts of radio energy (traveling at the speed of light) are transmitted, reflected off a target and then returned as an echo. Radar makes use of a phenomenon we have all observed, that of the **ECHO PRINCIPLE**.

*SST*

**Signature of Course In charge**

*Pune*

**Signature of HOD ECE**





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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION**  
**ENGINEERING**  
**TEACHING AND LEARNING**

**CONTENT BEYOND SYLLABUS (CBS) REPORT**

<b>Academic Year</b>	2023-24 (EVEN)
<b>Name of the Faculty</b>	Dr.Dinesh Kumar D S
<b>Course Name /Code</b>	RADAR ENGINEERING/18EC823
<b>Semester/Section</b>	VIII/B
<b>Activity Name</b>	Poster Presentation
<b>Topic Covered</b>	All Modules
<b>Date</b>	13/4/2024 to 8/5/24
<b>No. of Participants</b>	52
<b>Objectives/Goals</b>	<ul style="list-style-type: none"><li>• To improve the self-learning and presentation skills of students</li><li>• To improve the communication skills of students.</li></ul>
<b>ICT Used</b>	Posters
<b>Appropriate Method/Instructional materials/Exam Questions</b>	<ul style="list-style-type: none"><li>• Initially delivered lectures on Radar Engineering.</li><li>• Later students were formed into groups, assigned with a topic, asked to prepare A3 size poster, and give oral presentation.</li><li>• Students are given with additional information/ sources from which they can prepare.</li></ul>
<b>Relevant PO's</b>	5,9,10,12
<b>Significance of Results/Outcomes</b>	<ul style="list-style-type: none"><li>• Students tried to explore the importance of radar engineering, improved their self-learning, communication, and team management skills as an individual and team member.</li><li>• Students submitted posters in a group of four, and delivered their presentation.</li></ul>
<b>Reflective Critique</b>	<ul style="list-style-type: none"><li>• The activity improved the self-learning of students.</li><li>• The activity provided a platform for students to interact with peers, improve their communication skills, and work as individuals and as team.</li></ul>

Signature of Course In charge

Signature of HOD ECE



<b>CONTENT BEYOND SYLLABUS ACTIVITY - RADAR ENGINEERING-18EC823</b>		
<b>SL NO</b>	<b>STUDENTS BATCH WITH USN</b>	<b>TITLE OF POSTER PRESENTATION</b>
1	Rahul Krishnan V(1KS20EC073) Sumukha S(1KS20EC103), Tarun Prasanna (1KS20EC105), Tejas N Reddy(1KS20EC106)	MTI RADAR
2	Rakshith R (1KS20EC077)Sharath M (1KS20EC093) Shreyas P S Rao (1KS20EC098) Uday C H (1KS20EC108)	MOVING TARGET DETECTOR (MTD)
3	Neha CR (1KS20EC061) Pavani TS (1KS20EC065)	ENVELOPE DETECTOR
4	SHAKTHI ANBAZHAGAN M (1KS20EC092) SHASHANK S (1KS20EC094) SHIVA REDDY B A (1KS20EC095)	DETECTION OF SIGNAL IN NOISE
5	Neha Nagraj Airani (1KS20EC062) Prema G (1KS20EC068) Ramya T (1KS20EC080)	DELAY LINE CANCELLERS
6	Rakshitha A Vinay Sagar V Alur Rahul R	DOPPLER MTI SIGNAL PROCESSOR
7	Pradhyumna S Kashyap 1KS20EC066 Rajath K achar-1KS20EC075 Vineeth MS- 1KS20EC116	MONOPULSE TRACKING
8	Vaishnavi VH(1KS20EC111) Vijayalakshmi K(1KS20EC113) Yashilaa S(1KS20EC117)	CONICAL SCAN TRACKING RADAR
9	Sachin N M (1KS20EC084) Sandeep Y H (1KS20EC087) Ujjwal Naidu (1KS20EC109) Vinay S P (1KS20EC114)	RADAR EQUATION WITH WAVEFORMS
10	SHREYA-1KS20EC096 SHWETA DEEPAK-1KS20EC099 SUMANA-1KS20EC102	RADAR DISPLAYS
11	RAKSHITH N M-1KS20EC076 ROHITH AK-1KS20EC082 SUDEEP.V-1KS21EC401	CW RADAR
12	N Shreya(1KS20EC059) Priyanka K(1KS20EC070) Sonika R(1KS20EC101)	SIMPLE RADAR
13	P VasanthKumar reddy(1ks20ec063) pavan c(1ks20ec064) Praveen DB (1ks20ec067)	WORKING PRINCIPLE OF RADAR