



INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi | Affiliated to JNTUH, Hyderabad | Accredited by NAAC & NBA)
Hyderabad | PIN: 500068

Department of Electronics and Communication Engineering

REPORT ON

ONE WEEK ONLINE FDP ON RF TECHNOLOGY FOR ENERGY HARVESTING, MEDICAL, AND COMMERCIAL APPLICATIONS (14th to 18th December 2020)

One week online FDP on RFTEMC2020 proposed, and initiated by the Dept. of ECE, and immediately got approved from the Principal, and the Management of Sreyas Institute of Engineering and Technology. 208 participants have registered for the FDP. We are happy to inform you that maximum participants are from all the parts of India, and we received two international participants from Russia and Dubai.

The following topics have focused in the FDP:

- Microwave Communication
- Design and Implementation of Antennas for Industrial Applications
- RF technology for concealed target detection using radio tomography
- Computational electromagnetic for medical applications
- EMI/EMC
- Liquid Antennas for advanced communication systems.
- Fractal array antennas and applications.
- Microwave Imaging.

The detailed day wise report as follows,

DAY.1

First day of the program have started by the inaugural address by the Principal Dr. S. Sai Satyanarayana Reddy, Chief guest Prof. P. V. Y. Jayasree, Convener Prof. B. Sreenivasu, and the coordinator, Dr. V. A. Sankar Ponnappalli. Chief guest emphasized on the importance of high frequency electronics for various applications.

Resource person of the Session.1 of the first day, Prof. P. V. Y. Jayasree from GITAM discussed about the EMI/EMC issues, various sources for emi sources observed in day-to-day life, and how



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to avoid interference issues. Resource person explained few case studies on EM interference issues.

Resource person of the Session.2 of the first day, Dr. D. Rama Krishna from Osmania University delivered his lecture on reconfigurable antennas for advanced wireless applications. He showcased various RECONFIGURABLE antennas for 5G and other advanced applications, developed by the centre of excellence microwave lab of ECE Department, OU.

DAY.2

Session.1 of the Day.2 started with the resource lecture by Prof. S. Raghavan from Department of ECE, NIT Tiruchy. Prof. Raghavan shared his vast experience in microwave engineering, and basically concentrated on the transmission lines for planar antennas.

Session.2 of the Day.1 started with the resource lecture by Dr. Swtha amit from M.S. Ramaiah Institute of Technology, and she concentrated on the advanced antenna model, (i.e.) liquid antennas. She is also shared their research work on liquid antennas, and suggested research ideas on these antennas.

DAY.3

Session.1. of the Day.3 carried out by the Dr. M. Nanda Kumar from Dept. of ECE, Sreenidhi Institute of Science and Technology Hyderabad. He is concentrated on the one of the trending topic in antenna design (i.e.) wearable antennas, and suggested few research ideas for young researchers.

Session.2 of the Day.3, Dr. Amit R Azad from BITS Pilani Hyderabad given a resource lecture on Microwave filters, and substrate integrated waveguides (SIW's).

DAY.4

Session.1 of the Day.4, Started with the presentation of Dr. E. Mallikarjun from Dept. of ECE, NIT Goa, and He concentrated on the Microwave Imaging and application in medical, military, and commercial applications.

Session.2 of the Day.4 taken by the both Dr. Nanda Kumar from SNIST, and Dr. V. A. Sankar Ponnappalli from Dept. of ECE, Sreyas IET. Dr. Nanda Kumar concentrated on the SIW antennas and recent applications. Dr. V. A. Sankar Ponnappalli focused on fractal array antennas and applications, and also discussed about the research ideas on fractal arrays.



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Day.5

Session.1 of the Day.5, Dr. Shivaraj M Rathod from Defence R&D unit of Bharat Forge Limited, Pune. Dr. Shivaraj concentrated on the RF technology for concealed target detection using Radio Tomography, and Microwave imaging concepts. He also explained about the internship and training programs in RF & Microwave Engineering provided by Bharat Forge unit. Session.2 of the Day.5, taken by the Dr. T. Shanmuganatham from Pondicherry Central University, Pondicherry on one of the trending topic (i.e.) fractal metamaterial antennas, and he explained about the various design aspects of fractal based metamaterial antennas.

Resource Persons

Name	Designation & Affiliation
Dr. S. Raghavan	Dept. of ECE Professor (Retd.), NIT Trichy
Dr. T. Shanmuganatham	Associate Professor Dept. of Electronics Engineering, School of Engineering and Technology, Pondicherry Central University, Pondicherry.
Dr. P. V. Y. Jayasree	Professor Dept. of Electronics and Communication Engineering GITAM (Deemed to be University), Visakhapatnam
Dr. D. Rama Krishna	Associate Professor, Dept. of Electronics and Communication Engineering Osmania University, Hyderabad
Dr. E. Mallikarjun	Assistant Professor, Dept. of Electronics and Communication Engineering, NIT Goa
Dr. Nanda Kumar	Assistant Professor, Dept. of Electronics and Communication Engineering, SNIST Hyderabad
Dr. Shiva Raj Rathod	Assistant Manager (Defense R&D) Bharat Forge, Pune
Dr. Amit Ranjan Azad	Assistant Professor Department of Electrical and Electronics Engineering Birla Institute of Technology and Science, Pilani Hyderabad Campus
Dr. Swetha Amit	Assistant Professor Department of Electrical and Electronics Engineering M S Ramaiah Institute of Technology Bangalore
Dr. V. A. Sankar Ponnappalli	Associate Professor Dept. of Electronics and Communication Engineering Sreyas IET Hyderabad



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SESSION WISE SCREENSHOTS

DAY.1. SESSION-1

The screenshot shows a Microsoft Teams meeting interface. At the top, there's a notification: "You're recording You are recording this meeting. Be sure to let everyone know that they are being recorded. Privacy policy". The main content area displays a slide titled "Typical Open-Area Test Sites (OATS)" with a diagram of a test site. The slide is from GITAM (GODAVARI INSTITUTE OF TECHNOLOGY) and is dated 14 December 2020. The meeting controls at the bottom show a timer at 02:25:41 and various icons for mute, video, chat, and call. The 'People' list on the right shows 2 presenters and 42 attendees. The Windows taskbar at the bottom shows the time as 11:42 AM on 14/12/2020.

DAY.1. SESSION-2

The screenshot shows a Microsoft Teams meeting interface. At the top, there's a notification: "You're recording You are recording this meeting. Be sure to let everyone know that they are being recorded. Privacy policy". The main content area displays a slide titled "DISCUSSION ON MEASURED RESULTS" with the following bullet points:

- There is a shift in frequency due to effect of biasing circuit, assembly and fabrication error ,this can be avoided by a better matching circuit and isolated power supply for the PIN diodes.
- In the axial ratio measurement, the variation in the received power is more than 30dB which indicates that the antenna is linearly polarized.
- The variation in the received power is less than 4dB this indicates that the antenna is circularly polarized. The Table 1 shown the polarization states of the developed antenna.

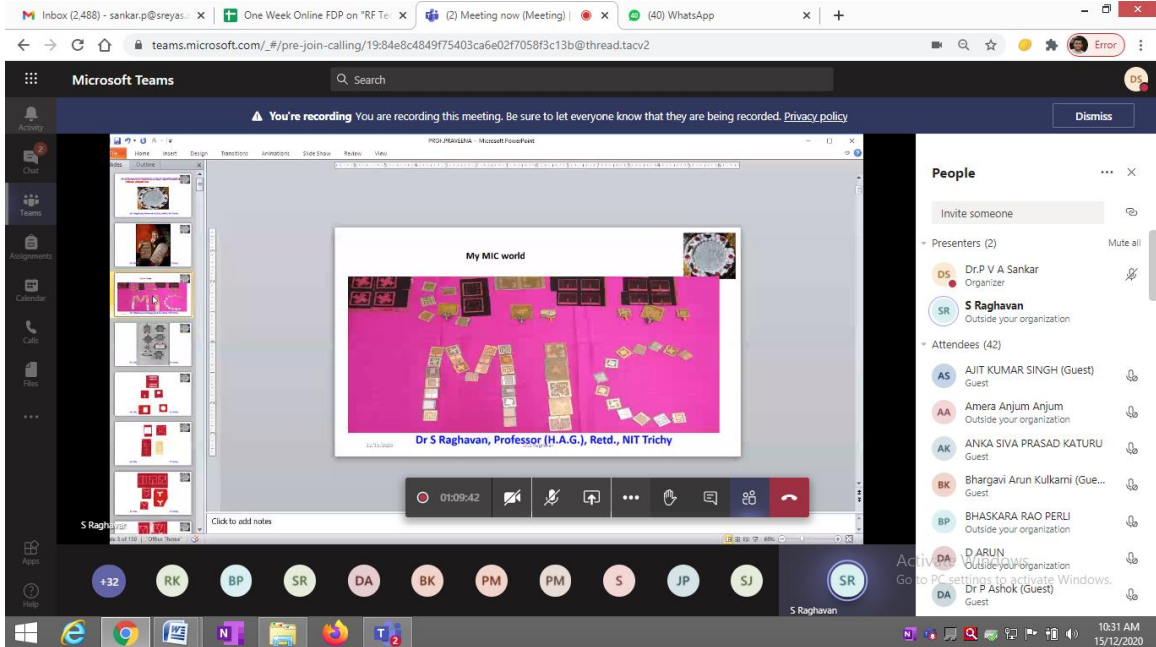
The meeting controls at the bottom show a timer at 02:07:02 and various icons for mute, video, chat, and call. The 'People' list on the right shows 3 presenters and 48 attendees. The Windows taskbar at the bottom shows the time as 3:40 PM on 14/12/2020.



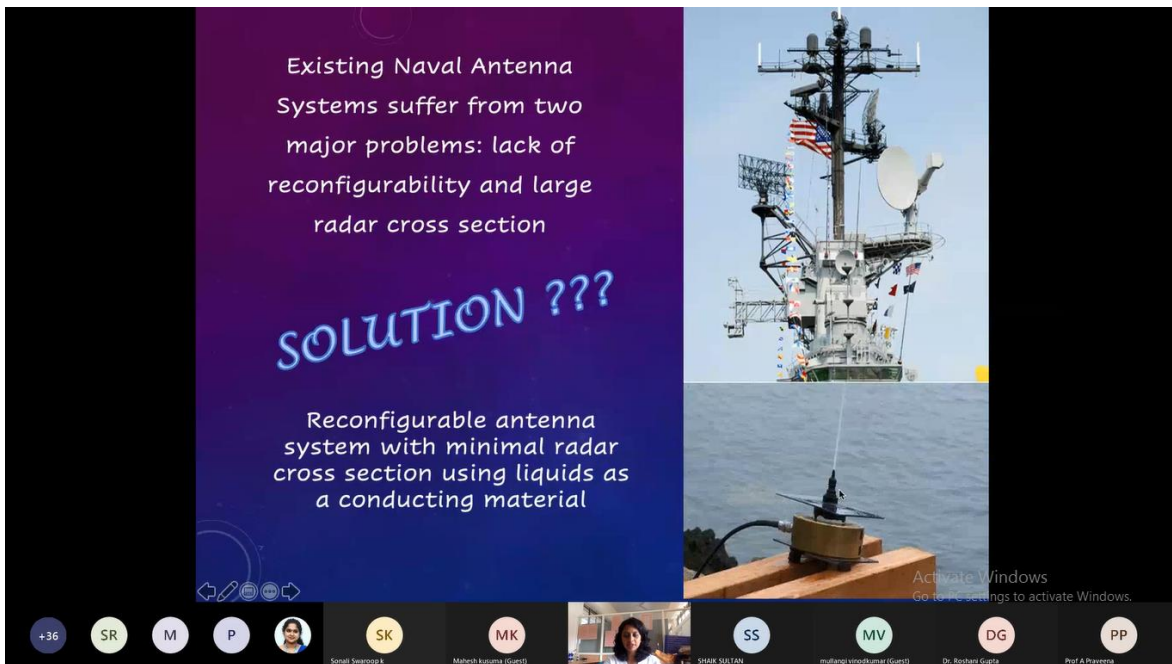
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DAY.2. SESSION.1



DAY.2.SESSION.2





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DAY.3. SESSION.1

The screenshot shows a Microsoft Teams meeting interface. The main content is a presentation slide titled "Wearable Antennas @Sreyas Institute of Engineering and Technology" by Dr. Nanda Kumar M. The slide contains a table with the following data:

Field	Applications
Health	Glucose monitoring / Endoscopy / Oximetry / GPS tractor / Wearable Doppler unit
Entertainment	Smart watches / Music jackets / LED dress / Intelligent
Rescue and Security	Helmet / Tractors / Fitness bands / ...

The meeting interface includes a "People" list on the right with participants like Dr. P V A Sankar and Dr. Nanda Kumar M (Guest). The bottom of the screen shows the Windows taskbar with various open applications.

DAY.3. SESSION.2

The screenshot shows a Microsoft Teams meeting interface. The main content is a presentation slide titled "SIW Inline Filters". The slide includes a diagram of a SIW second-order inline filter and its coupling topology, and a graph of simulated S-parameters showing a resonance dip at approximately 10 GHz. The graph plots S-Parameters (dB) from -50 to 0 against Frequency (GHz) from 8 to 12. The parameters are S_{21} (solid line) and S_{11} (dotted line).

Figure: SIW second-order inline filter and its coupling topology

Figure: Simulated S-parameters

Parameters listed on the slide:

- Rogers RT/Duroid 5880
- $\epsilon_r = 2.2$
- $h = 0.508$ mm
- Chebyshev filter
- $RL = 20$ dB
- $f_c = 10$ GHz

The meeting interface shows a "People" list with participants like Dr. V A SANKAR and Dr. Amit Ranjan Azad (Guest). The bottom of the screen shows the Windows taskbar with various open applications.



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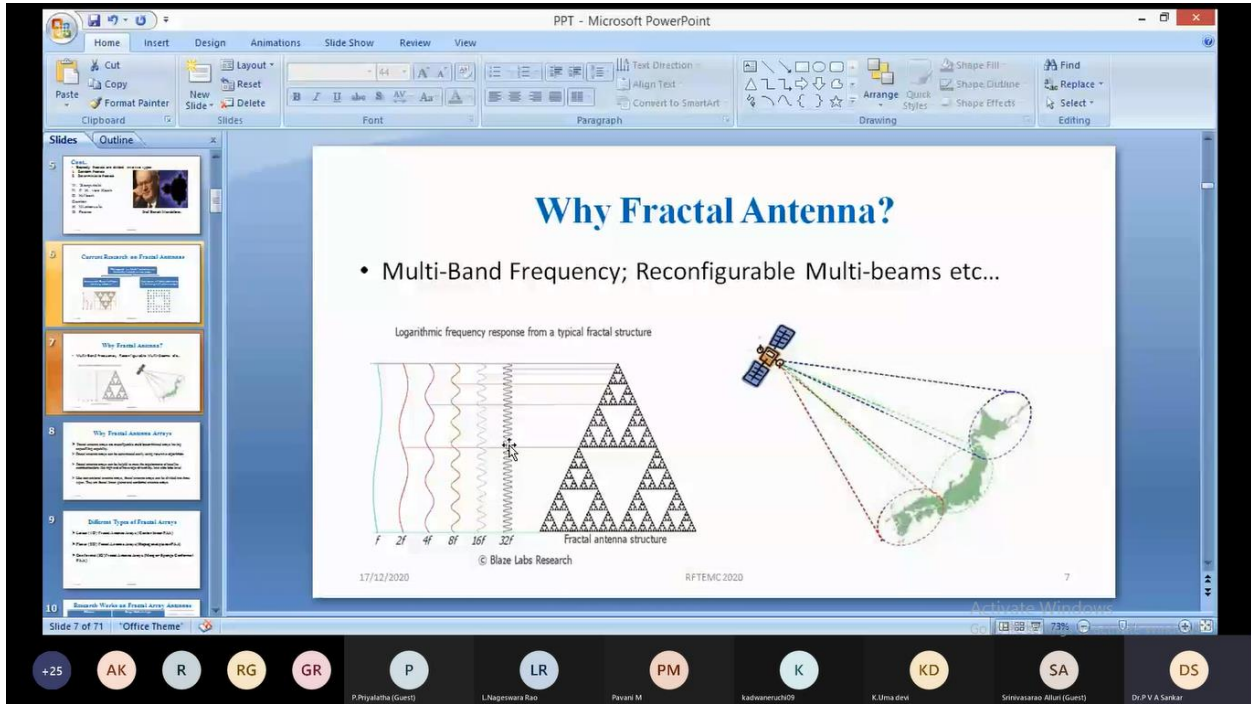
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DAY.4. SESSION.1

DAY.4.SESSION.2 (a)

Parameters	Values(mm)
W1/W2/W3/W4	0.7/3/2.2/2.3
W	14
W5	4.755
D2/D/S	1.0/3/0.6
Wg/W-g	3/3.6
L	6.7
L1	5
L2=L3	0.85

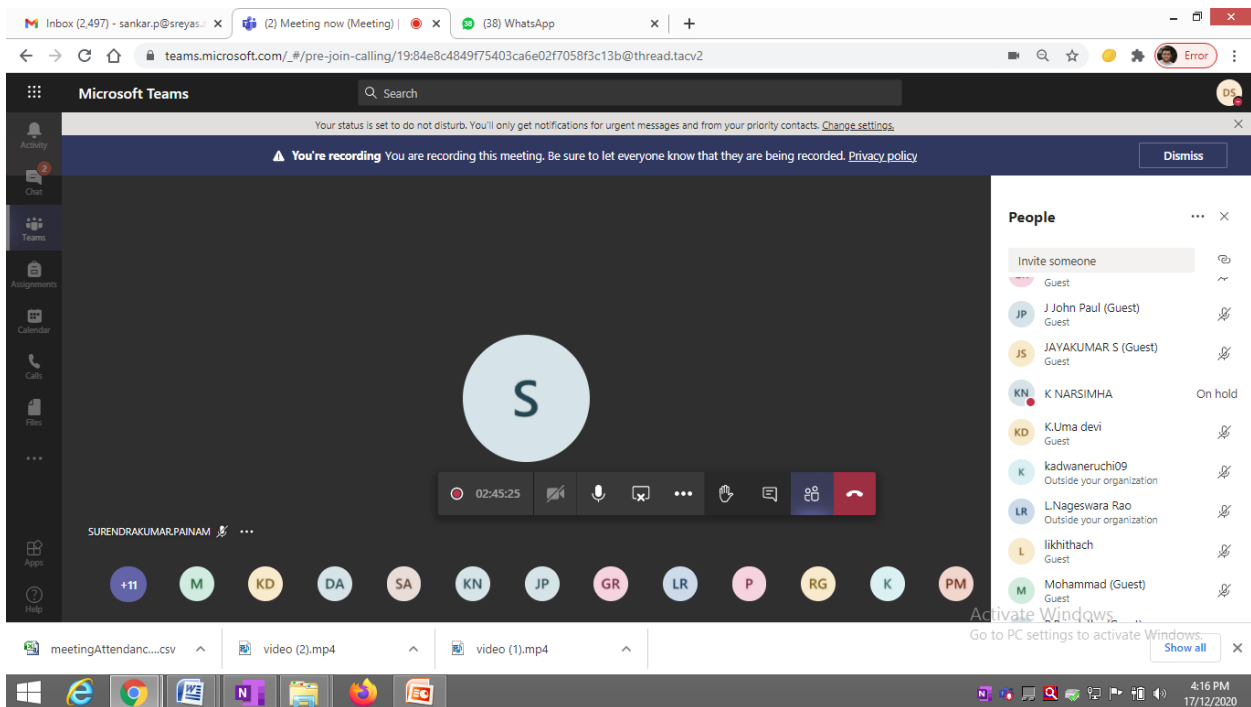
DAY.4.SESSION.2(b)



The screenshot shows a Microsoft PowerPoint window with the following content:

- Title:** Why Fractal Antenna?
- Bullet Point:** Multi-Band Frequency; Reconfigurable Multi-beams etc...
- Diagram:** A graph showing logarithmic frequency response from a typical fractal structure. The x-axis is labeled with frequencies: F , $2F$, $4F$, $8F$, $16F$, $32F$. The y-axis represents response. A fractal antenna structure is shown to the right of the graph.
- Image:** A satellite dish pointing towards a satellite in orbit, with beams of signal directed towards a map of India.
- Text:** Logarithmic frequency response from a typical fractal structure. © Blaze Labs Research. RFTFMC 2020.
- Footer:** 17/12/2020, Slide 7 of 71, Office Theme.

At the bottom of the PowerPoint window, there is a meeting control bar with icons for +25, AK, R, RG, GR, P, LR, PM, K, KD, SA, and DS.



The screenshot shows a Microsoft Teams meeting interface with the following details:

- Browser Tabs:** Inbox (2,497) - sankar.p@sreyas., (2) Meeting now (Meeting), (8) WhatsApp.
- Address Bar:** teams.microsoft.com/_/#/pre-join-calling/19:b4e8c4849f75403ca6e02f7058f3c13b@thread.tacv2
- Microsoft Teams Header:** Search bar, status message: "Your status is set to do not disturb. You'll only get notifications for urgent messages and from your priority contacts. Change settings.", and a "Dismiss" button for a recording notification.
- Recording Notification:** "You're recording You are recording this meeting. Be sure to let everyone know that they are being recorded. Privacy policy"
- People Panel:** A list of participants including Guest, J John Paul (Guest), JAYAKUMAR S (Guest), K NARSIMHA (On hold), K.Uma devi, kadvaneruchi09 (Outside your organization), L.Nageswara Rao (Outside your organization), Ikhithach, and Mohammad (Guest).
- Meeting Controls:** A central circle with the letter 'S', a timer showing 02:45:25, and icons for mute, video, chat, and other controls.
- Participant Bar:** A row of colored circles representing participants: +11, M, KD, DA, SA, KN, JP, GR, LR, P, RG, K, PM.
- Taskbar:** Windows taskbar at the bottom showing icons for meetingAttendanc..., video (2).mp4, and video (1).mp4. The system clock shows 4:16 PM on 17/12/2020.



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DAY.5.SESSION.1

Microsoft Teams

One week on-line Faculty Development Program
On
"RF Technology for Energy Harvesting,
Medical and Commercial
Applications"
14th to 18th Dec 2020
Organized by SIET-Hyderabad

RF Technology for Concealed
Target Detection using Radio
Tomography

Dr. Shivraj Rathod
Assistant Manager
Defence R & C
Bharat Forge Limi

BHARAT FORGE
KALYANI
Kalyani Centre for Technology and Innovation (KCTI)

BHARAT FORGE
CENTER OF EXCELLENCE IN RF &
MICROWAVE TECHNOLOGY

Kalyani Centre for Manufacturing and Materials (KMM)

Meeting now

Shivraj Rathod

Activate Windows
Go to PC settings to activate Windows.

DAY.5.SESSION.2

DAY.5.SESSION.2

Fractal Antennas For Multiband Applications

PONDICHERRY UNIVERSITY
VERS LA LUMIERE
सत्यमेव जयते

Dr. T. SHANMUGANANTHAM
Associate Professor
Dept. of Electronics Engineering
Pondicherry Central University
Pondicherry-605 014

Activate Windows
Go to Settings to activate Windows.



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BROCHURE

<p>Programme Organization</p> <p>Chief Patron Sri. Ananthula Vinay Kumar Reddy, Chairman</p> <p>Patrons Sri. Chintala Ravindranath Yadav, Secretary Sri. Nirvela Sharath Reddy, CEO & Treasurer Sri. Ananthula Hriday Reddy, Vice-Chairman</p> <p>Co-Patron Dr. S. Sai Sathyanarayana Reddy, Principal Professor of CSE</p> <p>Convenor Prof. B. SraenVBSU, Head of the Department, ECE</p> <p>Co-ordinators Dr. V. A. Sankar Ponnappalli, ECE Mrs. A. Praveena, ECE</p> <p>ADVISORY COMMITTEE: Dr. Suresh Avela, Dr. P. Chandrasekhar Reddy (JNTUH) Dr. L. Nimala Devi (OU) Dr. Raghavendra Rao (JNTUH-C&E) Dr. B. Prabhakar (JNTUH-C&E) Dr. J. Panduranga Rao, ECE Dr. Sandeep Kumar, ECE Dr. K. M. V. V. Prasad, ECE Dr. Abdul Nabi, HOD – CSE Mr. Y. Krishna, HOD – ME Mr. Md. Naseeruddin – HOD – H&S Mr. T. Raghth Kumar – HOD Ic – CE</p> <p>ORGANIZING COMMITTEE: Mr. Ch. S. V. Manoh Reddy, ECE Mr. K. Narsimha, ECE Mrs. Saranya Mathew, ECE Mr. Y. Sathish Kumar, ECE Mr. K. Mahesh, ECE Mr. G. Vijay Goud, ECE Mr. K. Sonali Swaroop, ECE Mr. G. D. Beesavani, ECE Mr. G. Ramachandra Kumar, ECE Mr. Sk. Md. Rafi, ECE Mrs. A. Sowjanya, ECE Mr. K. Manohar, ECE Mr. S. Subrahmanyam, ECE Mrs. Bhargavi Kulkarni, ECE Mrs. Nisha Mirza, ECE Mrs. S. Pallavi, ECE Mrs. S. Swarna, ECE Mrs. M. Paveethi, ECE Mr. N. Ramesh, ECE Mr. G. Srinivasa Rao, ECE Mr. Y. Sravan Kumar, ECE</p>	<p>Resource Persons</p> <p>Dr. S. Raghavan Professor (Retd.), NIT Trichy.</p> <p>Dr. T. Shanmuganatham IEEE Antenna and Wave Propagation Society Chairman, Madras Section, Assoc. Professor, Pondicherry Central University, Pondicherry.</p> <p>Dr. P. V. V. Jayasree Professor, GITAM (Deemed to be University), Visakhapatnam.</p> <p>Dr. D. Rama Krishna Associate Professor, Osmania University, Hyderabad.</p> <p>Dr. Shiva Raj Rathod Assistant Manager, Bharat Forge, Pune.</p> <p>Dr. Amit Ranjan Azad Assistant Professor, BITS Pilani, Hyderabad.</p> <p>Prof. Vinod Babu P Assistant Professor, RGUKT Nuzvid.</p> <p>Dr. Swetha Amit Asst. Professor, M. S. Ramalal Institute of Technology, Bangalore.</p> <p>Dr. Nanda Kumar Assistant Professor, SNIST, Hyderabad.</p> <p>Dr. V. A. Sankar Ponnappalli Associate Professor, SIET, Hyderabad.</p> <p>Registration Link https://docs.google.com/forms/d/e/1FAIpQLSegMOG6BSocLSppz-IZeSjFEGPVW2JnOm3dHAmhKdNlHY3A/viewform?usp=st_link</p> <p>Contact Us Dr. V. A. Sankar Ponnappalli Phone: 8125550694, Email: sankar.p@sreyas.ac.in Mrs. A. Praveena Phone: 7386027171, Email: praveena.a@sreyas.ac.in</p>	<p>One Week Online Faculty Development Programme On RF TECHNOLOGY FOR ENERGY HARVESTING, MEDICAL, AND COMMERCIAL APPLICATIONS. (14th December to 18th December, 2020)</p> <p>Organized by: Department of Electronics and Communication Engineering</p> <p>SREYAS INSTITUTE OF ENGINEERING & TECHNOLOGY (Approved by AICTE, New Delhi, Affiliated to JNTUH Hyderabad.) Accredited by NAAC & NBA Bandlagada, Nagole, Hyderabad - 500068.</p>
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<p>About SIET: Sreyas Institute of Engineering and Technology (SIET), sponsored by Sreyas Educational Society is established in the year 2011 in the state of Telangana by eminent educationists with a social conscience and commitment. The institution with a vision of serving the society through value-based education has been making a mark in the educational map of this region. Sreyas Institute is located in a sprawling campus of about 10.02 acres, amidst sylvan surroundings with aesthetically built infrastructure.</p> <p>The institute offers academic programs with innovative curriculum, advanced research in cutting-edge technologies and societal engagement through outreach activities. It has grown in its size and stature over the years with an initial intake of 300 to 720 students. The placements have reached new avenues with more than 300+ companies conducted interviews. Within a span of short time the Institute has grown in all the dimensions.</p> <p>SIET is one of the premier Engineering Colleges in Telangana. The institute currently offers six undergraduate programmes (B. Tech) – Computer Science and Engineering; CSE Data Science; CSE Artificial Intelligence and Machine Learning; Electronics and Communication Engineering ; Mechanical Engineering and Civil Engineering. The institution was accredited by NAAC and by National Board of Accreditation (NBA).</p>	<p>About the Department: The Department of Electronics and Communication Engineering was established in the year 2011 with an intake of 120 students and is increased to 240 in the year 2013. The main objective of the Department is to impart students with the knowledge of innovation, research and ethics. All through its sparkling history of 9 years, the Department of ECE has been known for its exceptionally strong Under-Graduate and Post Graduate programs. One student of this department was awarded with a Gold Medal by JNTUH for his exceptional performance in UG with 86% and is ranked third in the university in the year 2018. Many students from the department are either pursuing their Master's in various reputed universities around the world or working in reputed IT companies like TCS, CTS, Accenture etc. The Department has around 35 well qualified and experienced faculties. The Department has 13 well equipped laboratories and well stacked department library.</p> <p>The major attractions of the Department:</p> <ul style="list-style-type: none"> The Centre of Excellence (COE) to provide a student leadership, best practices, research, support and/or training to meet the industrial standards in four major areas like Signal Processing and Communication Systems, VLSI, IoT and Antennas. We have Established CISCO Centre of Excellence Laboratory under Cisco Networking Academy where many students have undergone training for practical sessions to meet industry requirements. We have Remote Centre for IIRS Dehradun and IIT Mumbai. IEEE student chapter, ISTE, NPTEL Local chapter to facilitate effective interaction with the industry and academia through seminars / symposia / workshops. 	<ul style="list-style-type: none"> Total number of Faculty publications in last 3 years is around 110. We have strong group of well experienced faculties who give GATE coaching to the students within the college hours There are 4 Ph.D holders and most of the faculties are pursuing Ph.D. <p>About FDP: This FDP will provide an opportunity to highlight recent trends and developments in the field of high frequency electronics, and communication systems. It will further give impetus to the participants towards bringing out newer and efficient techniques. Expert invited speakers from both industry and academia with their vast research experience in various fields will arouse the participants for the development of communication engineering.</p> <p>The following topics are focused in the FDP:</p> <ul style="list-style-type: none"> Microwave Communication. Design and Implementation of Antennas for Industrial Applications. RF technology for concealed target detection using radio tomography. Computational electromagnetic for medical applications EM/EMC. Liquid Antennas for advanced communication systems. Fractal array antennas and applications. Advanced CAD tools for Antenna and high frequency circuit design. <p>Eligibility: Faculty members, Ph.D Scholars, and PG students from AICTE approved engineering colleges and institutions, and R&D organizations.</p>
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Memorable Event Photos from FDP

The screenshot shows a Microsoft Teams meeting interface. At the top, a notification states: "Recording has started. This meeting is being recorded. By joining, you are giving consent for this meeting to be recorded. [Privacy policy](#) Dismiss". The main content is a PowerPoint slide titled "FDP VALEDICTORY - Microsoft PowerPoint". The slide text reads: "WELCOME TO THE VALEDICTORY SESSION ONE WEEK ONLINE FDP ON RF TECHNOLOGY FOR ENERGY HARVESTING, MEDICAL, AND COMMERCIAL APPLICATIONS (14 December to 18 December, 2020) Organized by: Department of Electronics and Communication Engineering SREYAS INSTITUTE OF ENGINEERING & TECHNOLOGY (Approved by AICTE, New Delhi, Affiliated to JNTUH Hyderabad, Accredited by NAAC & NBA)". The meeting controls at the bottom show a timer at 47:36 and icons for chat, mute, video, and screen share. On the right, the "People" panel lists 5 presenters and 40 attendees. Presenters include Prof.B.Sreenivasu (Guest), S Raghavan, Dr.P.V.A Sankar (Organizer), Dr.T.Shanmuganatham (Guest), and Sai. Attendees include ARUNA, Bhaskara Rao Perli (Guest), Dr.B.Saidaiiah, and Dr.P.ASHOK. A system message at the bottom of the attendees list says "Activate Windows. Go to Settings to activate Windows." The Windows taskbar at the very bottom shows the search bar, taskbar icons, and system tray with the date 12/18/2020 and time 3:30 PM.