Velagapudi Ramakrishna Siddhartha Engineering
Department of Electronics & Communication Engineering
News Letter
Volume 8 Issue 2 Jan - June 2021

Inside the Issue

Vision

To produce globally competitive and socially sensitised engineering graduates and to bring out quality research in the frontier areas of Electronics & Communication Engineering.

Mission

To provide quality and contemporary education in the domain of Electronics & Communication Engineering through periodically updated curriculum, best of breed laboratory facilities, collaborative ventures with the industries and effective teaching learning process.

To pursue research and new technologies in Electronics & Communication Engineering and related disciplines in order to serve the needs of the society, industry, government and scientific community.

Program Educational Objectives (PEOs)

After 3 to 5 years of graduation, electronics & Communication Engineering graduates will

PEO1: Excel in their professional career and higher education in Electronics & Communication Engineering and related fields.

PEO2: Exhibit leadership through technological ability and contemporary knowledge.

PEO 3: Adapt to emerging technologies for sustenance in their relevant areas of interest.

About the Department

Accreditation of B. Tech and MTech programmes by NBA, New Delhi to turn out globally recognized graduates.

40% of the faculty with Ph.D. qualification from premier institutions encompassing IITs, NITs, BITS and government universities to institute strong foundation and impart necessary skills

Establishment of TIFAC CORE in Telematics by DST, New Delhi and industries with outlay of 10 Crores, first of its kind in the state of AP, for producing industry ready students in the focused core areas.

Conduct of research and guidance in the focused areas of Antennas, Image Processing, RF&MW, VLSI & ES, Telematics.

More than 75% of the students are being absorbed by reputed MNCs'.

The Teaching-Learning process adopts different methods such as experiential learning, participative learning and problem-solving methodologies utilizing ICT facilities, LMS and e-resources. All the academic activities are carried out strictly following the academic and activity calendar. Proctor dairy system is in place for counselling and to monitor academic and personal issues of students. Necessary efforts are being made in identifying the learning levels (slow and fast) of the students through various assessments and additional training is imparted to slow learners.

Department encourages academic discussions between faculties and students using black board and faculties shares academic study material using it.

Use of modern teaching aids like LCD projectors, Wi-Fi enabled laptops are usually employed in classrooms and other student learning environments

Department has introduced EPICS (Engineering Projects for Community Services) in the curriculum along with mini and major projects. In EPICS students will go to the society (villages/ hospitals/ towns etc.) to identify the problem and survey the literature for a feasible solution.

Expert video subject lectures delivered by the various eminent resource persons are available in the digital library and it facilitates the faculty and students to utilize E-Tutorials of NPTEL, MOOCs access E-Journals, Video Conference, etc.

Faculty members use department library, digital library and other Open-Source platforms to enhance their teaching skills. The faculty members are encouraged to participate in short term courses, staff development programs and workshops on advanced topics to keep pace with the advanced level of knowledge and skills.

Program Specific Outcomes (PSOs)

After completion of electronics & Communication engineering Program, the students will be able to have ability to:

PSO 1: Demonstrate proficiency in the use of IOT required in real -life applications

PSO 2: Implement functional blocks of hardware/software designs for signal processing and communication applications.

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The major goal of the Department of ECE is to produce extremely educated and skilled young engineers who can achieve heights in diverse job outlines. To attain this program provides basis in both systematic and technical issues of ECE. It also delivers sufficient prospects to students to work on projects, advance in communication skills discover internship opportunities in industry and take part in national and international contests

Inside the issue.....

Governing Body Members

Sri. N.Venkateswarlu
President. SAGTE

Sri.P.Lakshmana Rao
Secretary SAGTE

Sri. M. Rajaiah
Vice-President & Convener
SAGTE

Dr A V Ratna Prasad
Principal, VRSEC

Dr D Venkata Rao
Professor & HOD ECE

Faculty achievements

Dr V Praveen Naidu

Associate Professor

- Achieved Highest H-index and highest number of SCOPUS & SCI publications @ VRSEC in all departments and all years with SCOPUS H-index of 15 with 512+ SCOPUS citations.
- Only faculty selected from INDIA and presented research work on “Small Satellites” at The Planetary Smallsats Symposiums held at NASA’S Goddard Space Flight Center, USA.
- Started operations of VRSEC First Faculty Startup & AP First Aerospace Startup named “NPHSAT SYSTEMS PVT LTD” and successfully registered and recognized by MSME, DPIIT and Startup India 2020.
- Delivered FDP guest lecture on " Small Satellites", from 10-08-2020 to 14-08-2020, State Board of Technical Education and Training, Andhra Pradesh.

The Commissioner of Patents has granted the patent on 26 May 2021, and certified that the below particulars have been registered in the Register of Patents.

SATYANARAYANA PAMARTHI Assistant Professor, Department of ECE, V. R. Siddhartha Engineering College Vijayawada, Andhra Pradesh- 520007 India

“ESTIMATION OF BIOMARKERS FOR ADAPTIVE IMMUNITY IN INFECTIOUS DISEASES USING SMART IOT SENSORS AND DEEP LEARNING”

Satyanarayana P
Assistant Professor

Dr M Durga Prakash

Associate Professor

The Commissioner of Patents has granted the patent on 31 March 2021 and certified that the below particulars have been registered in the Register of Patents.

M Durga Prakash Associate Professor, Department of ECE, V. R. Siddhartha Engineering College Vijayawada, Andhra Pradesh- 520007 India

“ARTIFICIAL INTELLIGENCE BASED SMART DETECTION OF LUCG DISESASE FROM CHEST X-RAY”

Grant in aid for the value of Rs. 10 Lakhs was approved for organising summer School on Geospatial Science & Technologies under National Geospatial Program (NGP) of DST, Govt. of India, was received by by Prof. R. Mariappan

Dr R Mariappan
Professor

BEST PAPER AWARDS TO FACULTY

- Mr P. Satyanarayana Assistant Professor Received "Best Paper Award" in National Conference Emerging Trends in VLSI, Embedded and Nano Technologies (NCEVENT-2021) for the paper titled "Performance Analysis of DSR and Cache customised DSR Steering Protocols in Wireless Mobile Adhoc Networks"

- Mr G. Kishore Kumar Assistant Professor Won "Best Paper Award" in International Conference Adaptive Computational Intelligence ICACI-2020 for the paper titled "Efficient Haar Wavelet Transform for Detecting Saccades and Blinks in Real-Time EOG Signal"
- Dr. V. Praveen Naidu Associate, Professor & Dr. Khalim Amjad Meerja, Professor IEEE WIECON - ECE 2020 Best Paper Award International Level for the paper titled "PID:65 Design, Simulation and Analysis of Swastika Shape Uniplanar ACS fed Antenna for Multiple Frequency band Operation"

- Dr. Khalim Amjad Meerja Professor Best Research Award, International Research Awards on new science inventions, Science Father International level in NESIN 2020 Awards.

Success is delivered only to the deserving

Congratulations on your newly found achievements

1. Design and Analysis of Multi octave band EW Phased array using a printed Radiator covering 6-18GHz; the sponsoring agent being DLRL, DRDO, Delhi with a grant of 65.05 lakhs was obtained and ongoing for the duration 2017-2021.

2. Optimization of low-cost lab-on-chip platforms for the development of Biomedical Applications: DST the sponsoring agent being SERB (SRG) with a grant of 23.91 lakhs was obtained and ongoing for the duration 2020-2022.

Dr A Anitha was given a role as Chief Consultant, offering Industrial Consultancy Services for "Efftronics Systems Pvt. Ltd." in development of "FPGA based Voter algorithm using VHDL for Fail safe systems" during April 2021.

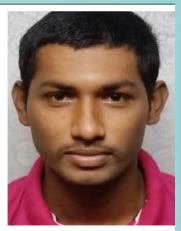
Students' achievement……All India GATE Ranks …..

G Vinay Kumar
Rank : 35

G Sai Chand
Rank: 451

N Karteek Ram Reddy
Rank: 1389

Ch S S Hamsika
Rank: 1672



P B Subrahmanyam
Rank: 1726

G Sahitya
Rank : 2171

M Moneesh
Rank : 2935

G Sai Suman
Rank: 4754

Ch Mani Kumar
Rank : 5334

K Dilip Kumar
Rank: 7965

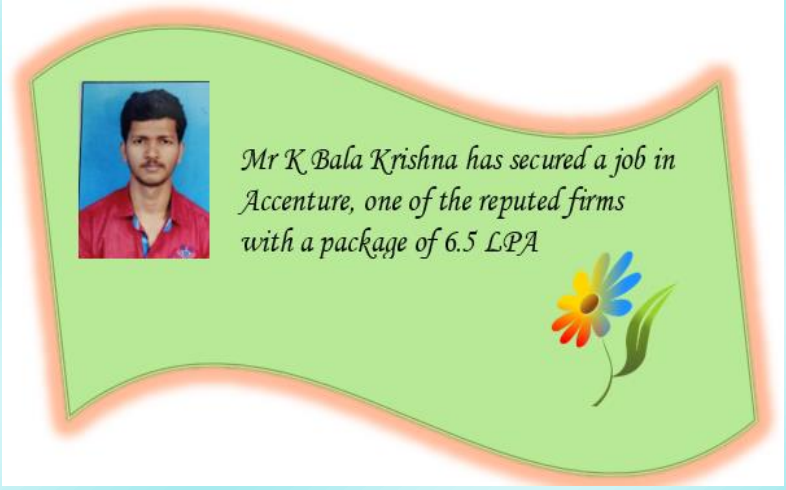
N V V N Sai
Rank : 9568

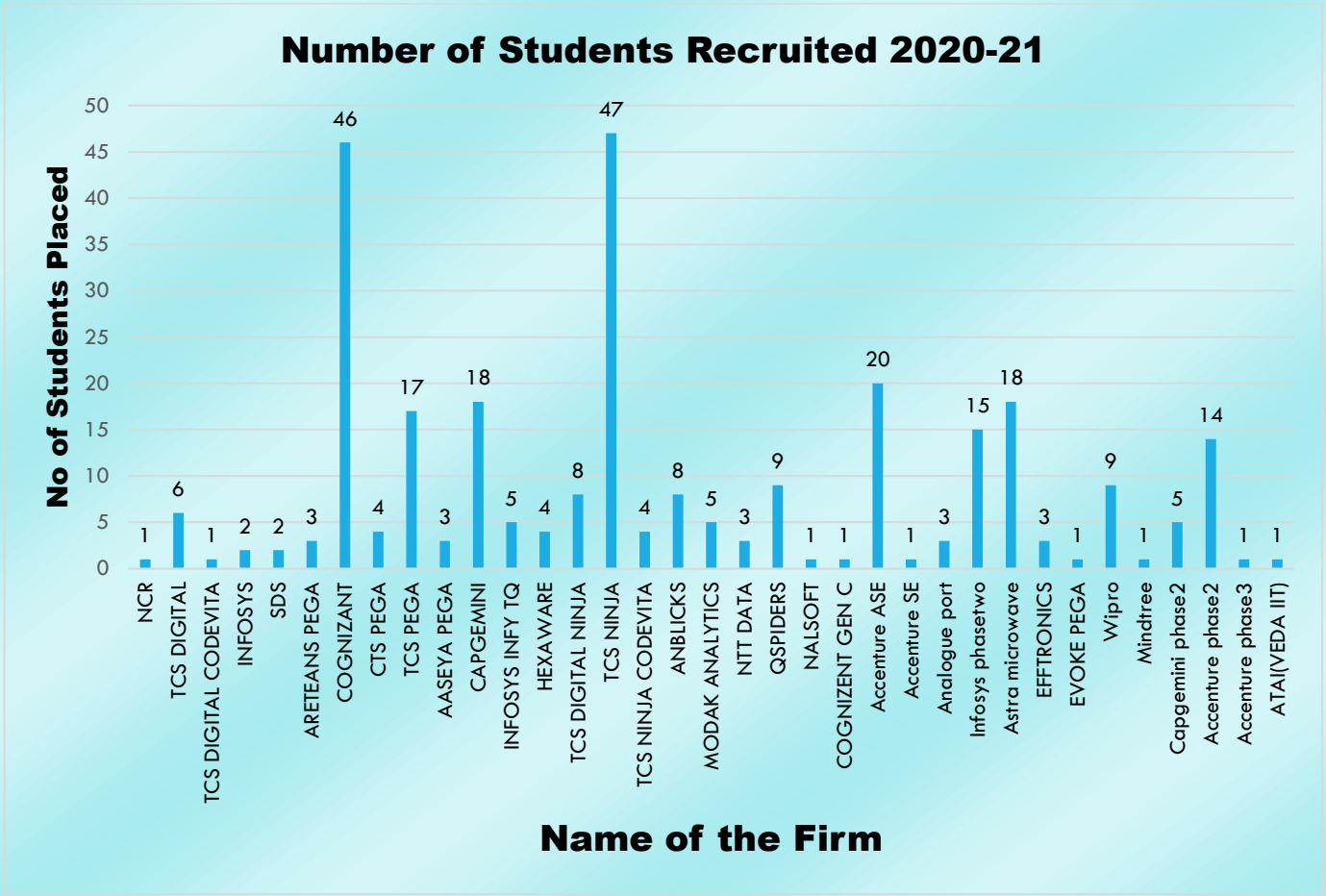
A N S Manana
Rank: 10300

Geetesh Kumar Konala
Rank : 14837

Students Achievement ..... Placement Details

Perseverance and skill have rewarded them with package of ***7 LPA in TCS Digital****. Department of ECE is proud of the achievement.*




Number of Students Recruited 2020-21
No of Students Placed
0
5
10
15
20
25
30
35
40
45
50
1
6
1
2
2
3
46
4
17
3
18
5
4
8
47
4
8
5
3
9
1
1
20
1
3
15
18
3
1
9
1
5
14
1
1
NCR
TCS DIGITAL
TCS DIGITAL CODEVITA
INFOSYS
SDS
ARETEANS PEGA
COGNIZANT
CTS PEGA
TCS PEGA
AASEYA PEGA
CAPGEMINI
INFOSYS INFY TQ
HEXAWARE
TCS DIGITAL NINJA
TCS NINJA
TCS NINJA CODEVITA
ANBLICKS
MODAK ANALYTICS
NTT DATA
QSPIDERS
NALSOFT
COGNIZENT GEN C
Accenture ASE
Accenture SE
Analogue port
Infosys phasetwo
Astra microwave
EFFTRONICS
EVOKE PEGA
Wipro
Mindtree
Capgemini phase2
Accenture phase2
Accenture phase3
ATAI(VEDA IIT)
Name of the Firm


Pay package (LPA) 2020-21
Salary in Lakhs Per Annum
0
1
2
3
4
5
6
7
8
NCR
TCS DIGITAL
TCS DIGITAL CODEVITA
INFOSYS
SDS
ARETEANS PEGA
COGNIZANT
CTS PEGA
TCS PEGA
AASEYA PEGA
CAPGEMINI
INFOSYS INFY TQ
HEXAWARE
TCS DIGITAL NINJA
TCS NINJA
TCS NINJA CODEVITA
ANBLICKS
MODAK ANALYTICS
NTT DATA
QSPIDERS
NALSOFT
COGNIZENT GEN C
Accenture ASE
Accenture SE
Analogue port
Infosys phasetwo
Astra microwave
EFFTRONICS
EVOKE PEGA
Wipro
Mindtree
Capgemini phase2
Accenture phase2
Accenture phase3
ATAI(VEDA IIT)
Name of the Firm

ECE::Student Publications

2020-2021

1. Dr. A. Jhansi Rani Guvvala Ramya Sri and Vanka Saritha, Design And Implementation Of A Very Compact Mimo Antenna Providing Dual Notches At WLAN And X-Band Progress In Electromagnetics Research C104 241-2521937-8718 August 2020 Electromagnetics Academy Scopus
2. Dr. M. Padmaja D.N.N. Kumari Architecture Design And Implementation Of Efficient Spiht Decoder For Health Applications, Journal Of Critical Reviews ,7.7, 2063-2069, Issn-2394-5125 2020
3. Dr. M. Padmaja K. Rajya Lakshmi, Design and Implementation Of Low Power Energy Efficient 2d Median Filter, International Journal Of Advanced Science And Technology, 294 10203-10209 Issn: 2005-4238 2020
4. Dr.Khalim Amjad Meerja,P. Haneesha, An Optimal Bit Error Rate Improvement Using Generalized Pattern Division Multiple Accesses In Wireless 5g Journal Of Critical Reviews7 15 5696-5706 Issn- 2394-51252020 Scopus
5. Dr. Praveen Naidu V, A Haranadh, Design And Performance Analysis Of Maze Shaped Quad Port Acs Fed Tri Band Mimo Antenna For V2v And Multi Band Applications Aeü - International Journal Of Electronics And Communications1341111Feb 2021 Elsevier Sci
6. Dr. Praveen Naidu V,Mahesh Babu, Sai Haranadh, ,A Compact Four-Port High Isolation Hook Shaped Acs Fed Mimo Antenna For Dual Frequency Band Applications Progress In Electromagnetics Research 113 68 82 June,2021 Progress In Electromagnetics Research
7. Dr. Praveen Naidu V,Sumanji, Mahesh Babu, Sai Haranadh Design And Performance Analysis Of G -Shaped Compact Acs Fed 4-Port Mimo Antenna For Triple Frequency Band Applications Progress In Electromagnetics Research 112 5568May, 2021, Progress In Electromagnetics Research
8. Dr. P.Sarah Suhasini,B Naga Priyanka, Vehicle Type Recognition In Video Frames Using Lbp With Cnn Journal Of Critical Reviews7 73895-3903 2394-5125 2020
9. Dr. B. L. Sirisha.P Pallavi,Analysis Of Diabetic With Retinopathy Using Image Processing Journal Of Critical Reviews 7155713-5723 Issn-2394-5125September, 2020Jcr Scopus
10. Dr. M. Durga Prakash, B. V. V. Satyanarayana, Pg Design Analysis Of Gos-Hefet On Lower Subthreshold Swing Soi, Analog Integrated Circuits And Signal Processing ,Doi: 10.1007/S10470-021-01821-2,March-2021,Springer,Sci
11. Dr. M. Durga Prakash, Caleb Meriga, Ravi Teja Ponnuri, B. V. V. Satyanarayana, A. Arun Kumar Gudivada, Asisa Kumar Panigrahy, Ug, A Novel Teeth Junction Less Gate All Around Fet For Improving Electrical CharacteristicsSilicon Doi: 10.1007/S12633-021-00983-Y Feb-2021,Springer,Sci
12. Dr. M. Durga Prakash,B Vamsi Krsihna, S Ravi, Recent Developments In Graphene Based Field Effect Transistors, MaterialsToday:Proceedings Https://Doi.Org/10.1016/J.Matpr.2020.07.678 2020/9/21,Elsevier,Scopus
13. Dr. M. Durga Prakash,B.V.V. Satyanarayana,Lower Subthreshold Swing And Improved Miller Capacitance Heterojunction Tunneling Transistor With Overlapping Gate MaterialsToday:Proceedings,Https://Doi.Org/10.1016/J.Matpr.2020.09.420,2020/10Elsevier Scopus
14. Dr. M. Durga Prakash,Pvk Kishore, Creation Of Three Stage Finfet Based Instrumentation Amplifier With 95 Db Gain For Medical Applications Materials Today:Proceedings Https://Doi.Org/10.1016/J.Matpr.2020.11.136 2020/12/19,Elsevier,Scopus

15 Mr. R.V.H. Prasad, M. Blissay Angilica, Compressive Sensing Reconstruction Of Sparse Ecg Signal Via Orthogonal Matching Pursuit Reconstruction Algorithm International Journal Of Advanced Science And Technology g: 14568-14577 2005-4238 May 2020

16 Mrs V.Saritha Guvvala Ramya Sri And Dr. A. Jhansi Rani Design And Implementation Of A Very Compact MIMO Antenna Providing Dual Notches At WLAN And X-Band Progress In Electromagnetics Research C 104 241-252 1937-8718 August 2020 Electromagnetics Academy Only Scopus

17 Smt. Aruna M. Yamini Divya Implementation Of 32-Bit Adders Using Different Full Adders International Journal Of Engineering Research And Technology 9 10 2278-0181 October 2020

18 Mr.K Prem Chand P. Aravind Body Of Revolution Conical Vivaldi Antenna For Phased Array Applications Ijmperd 103 8693-8700 2249-6890 July 2020

19 Smt. M Bhagya Lakshmi S. Naga Dhana Lakshmi Design And Analysis Of A 7.5 Mm All Metal Vivaldi Planar Phased Array Antenna International Journal Of Emerging Trends In Engineering Research (Ijeter) Accepted, 2347-3983 October-2020- Scopus

20 Ms. Naga Sunanda, Govindu Pavani, Low Area And Energy Efficient Inexact Multiplier Using Ahhr Encoding International Journal Of Advanced Science And Technology 277, Page No:14578- 14587 2005-4238 September 2020

Conferences

1 Dr.A.Jhansi Rani,G. Ramya Sri1, P.Srujana1, V.Saritha1,S.Tanmayi International conference on Smart and Intelligent systems , Springer book series- Algorithms for intelligent systems(issn:2524-7565) A Miniaturized Multi Band Antenna operating in C, X and Ku Bands February,25-26,2021 Department of EEE, VRSEC, Vijayawada Scopus International Springer book series- Algorithms for intelligent systems(issn:2524-7565) Springer

2 Dr M Padmaja B.Yogichandar, Md.Karishma,UG ,international conference on Smart and Intelligent systems ,Springer book series- Algorithms for intelligent systems(issn:2524-7565) High Resolution Spatial Data Analysis and Haze Removal,for Remote Sensing Images,February 25-26,2021 Department of EEE, VRSEC, Vijayawada Scopus International, Springer book series- Algorithms for intelligent systems(issn:2524-7565) Springer

3 Dr. M. Padmaja,Lakshmi, K.R,PG, 4th International Conference on Electronics, Communication and Aerospace Technology, Efficient and Enhanced High Throughput Image Denoising Using Chronical Fuzzy Set,5-7 Nov. 2020RVS Technical Campus, Coimbatore, India. Scopus, International ISBN:978-1-7281-6387-1 IEEE Xplore

4 Dr. V Praveen Naidu A Haranadh IEEE International conference, WIECON IEEE,Best Paper Award MIMO antenna for dual band applications Dec 2020,Scopus ,IEEE, Best Paper Award

5 Dr. P. S.Suhasini,Avvari Greeshma Kavya, Uruguti Aparna Lecture Notes in Electrical Engineering,Emerging Research in computing, Information and Applications: ERCICA 2020 ,Vol.2 (ISBN:978-981-16-1341-8) Emerging Research in computing, Information and Applications: ERCICA 2020 Enhancement of low light images using CNNSeptember 25-26 , 2020 NMIT, Bangalore Scopus International ISBN:978-981-16-1341-8 Springer

6 Dr Shaik Fayaz Ahamed Reshma Gunturu, Tarak sri harsha ,2nd International Conference on IoT, Social, Mobile, Analytics and Cloud in Computational Vision and Bio-Engineering http://dx.doi.org/10.2139/ssrn.3734801, Development of Drone based Delivery System using Pixhawk Flight Controller

7 Dr.SK. Fayaz Ahamed,K. V. N. S. Sivani, G. Preethika International Convference on Smart Electronics and communication\ Development of Acquisition Module for a software based IRNSS Receiver 10th -12th September 2020 Kongunadu College of EngineeringScopus International ISBN: 978-1-7281-5460-2 IEEE

8 Dr. M. Durga Prakash Caleb Meriga, Ravi Teja Ponnuri, B Vamsi Krishna, Shaik Ahmad Saidulu, 2020 International Conference for Emerging Technology (INCET) IEEE Dual Gate Junctionless Gate-All-Around (JL-GAA) FETs using Hybrid Structured Channels,2020/6/5, Scopus,IEEE

9 Dr. A. Anitha BOMMALA THRIVENI, 4th International Conference On,Smart Computing And Informatics,(SCI-2020)A Modified Signal Flow Graph & Memory-Based Radix-8 FFT Processor Design 9th - 10th, October, 2020 Hyderabad SCOPUS INTERNATIONAL Springer

10 Mr.Ch.Raghavendra K.Krishna Sai,V.Sai Naga Pranav International conference on Smart and Intelligent systems Springer book series- Algorithms for intelligent systems(issn:2524-7565)Design and Implementation of Low Profile Patch Beam Steering Antenna for Vehicular Applications". February 25-26,2021Department of EEE, VRSEC, Vijayawada Scopus International Springer book series- Algorithms for intelligent systems(issn:2524-7565) Springer

11 Mrs. V. Saritha,Anil Kumar Karra 2 , Shaik Khader Zelani , Ch.Prasanth International conference on Smart and Intelligent systems Springer book series- Algorithms for intelligent systems(issn:2524-7565) Cloud Connected Smart Energy Meter with Remote Monitoring and Control February 25-26,2021 Department of EEE, VRSEC, Vijayawada Scopus International Springer book series- Algorithms for intelligent systems(issn:2524-7565) Springer

12 Smt.B.Alekhya,K. V. L. S. Bharghavi, Mrs. K. Sneha, ICIECCA-2020 Design of a empirical model for reducing the attenuation caused due to rain 23rd to 25th November 2020 KLEF Deemed to be University, Vaddeswaram, Guntur Scopus.

13 Mr.P.Vijaya Kumar, V.Likith Kumar, A.HariPriya, N.Jahnavi Chakravarty,International conference on Smart and Intelligent systemsSpringer book series- Algorithms for intelligent systems(issn:2524-7565) Fabric Defect Detection Using Computer Vision , February 25-26,2021 Department of EEE, VRSEC, Vijayawada Scopus International Springer book series- Algorithms for intelligent systems(issn:2524-7565) Springer

14 MunappaSunitha, M.Parimala, M.Jyothirani, KBharghavSai, ICICV 2021 IEEE IoT based Intelligent Fertigation through Drip Irrigation 04-06FEBRUARY2021 FRANCIS XAVIER ENGINEERING COLLEGE TAMIL NADU SCOPUS INTERNATIONAL 978-0-7381-1183-4 IEEE

15 M. Sunitha, PVSS Datta Vinay, B. Dinesh Kumar, I-Smac, IEEE, IP Based Surveillance Robot Using IOT 07-09 October 2020 Scad, It, Tamilnadu, Scopus,International 978-1-7281-5465-0 IEEE

16 Mr. G.Kishore Kumar , Hemamalini Divakala 2020 Sixth International Conference on Bio Signals, Images, and Instrumentation (ICBSII) Delay and Power Efficient FIR Architecture for Noise Suppression of EOG Signal 27-28 Feb. 2020

17 V.Siva Reddy K.Indraja, G.Venkateswarlu, K.Likitha IETE National Conference on Emerging technologies for intelligent electronic system design, Optimum delay and power dissipation using 14T SRAM with virtual ground June 29-30 2021 NIT Bhopal

18 V.Siva Reddy G. Vijay Kumar, T.Rupesh Sai Manikanta, IETE National Conference on Emerging technologies for intelligent electronic system design Design of low power Hybrid full adder using GDI logic for energy efficient devices June 29-30 2021 NIT Bhopal

19 Smt.K Sneha E. Prathyusha, Smt. B. Alekhya International conference on Smart and Intelligent systems Springer book series- Algorithms for intelligent systems(issn:2524-7565) A rectangular SIW MIMO antenna for IOT and UWB applications February 25-26,2021 Department of EEE, VRSEC, Vijayawada Scopus International Springer book series- Algorithms for intelligent systems(issn:2524-7565) Springer

Core values of the institute

V R Siddhartha Engineering college engages itself in a process of self and community reflection that leads the institution to recognize and heighten awareness of the core values the college is practising and to develop an institutional culture that stands accountable to those values

1. **Commitment**
   - Responding to the changing need of our region and nation
   - Develop a shared decision-making process
2. **Respect**
   - Include stake holders in the decisions
   - Recognise and support employee contributions
3. **Excellence**
   - Anticipate techno-social need and respond accordingly
   - Encourage innovation and interdepartmental collaboration
4. **Accountability**
   - Continuously evaluate and improve the academic and administrative systems
   - Demonstrate responsibility through stakeholder satisfaction
5. **Diversity**
   - Ensure fair and equal access for all
   - Recognise, appreciate and celebrate diversity
6. **Cultural competence**
   - Encourage ideas and participate
7. **Learning environment**
   - Outstanding physical infrastructure, along with a culture of excellence
8. **Community**
   - Value and respect Collegiality, Partnerships, Safe and Healthy Environment and Service
9. **Integrity**
   - Committed to ethical and responsible behaviour

Quality policy

VRSEC strives to impart Knowledge, Skills and Attitude through continuous improvement to meet the ever-changing needs of Industry and the Sustainable Development of Society

PROGRAM OUTCOMES (POs)

PO1	**Engineering knowledge:** An ability to apply knowledge of mathematics, science, fundamentals of engineering to solve electronics and communication engineering problems.
PO2	**Problem analysis**: An ability to identify, formulate and analyse electronics and communication systems reaching substantiated conclusions using the first principles of mathematics and engineering sciences.
PO3	**Design/development of solutions:** An ability to design solutions to electronics and communication systems to meet the specified needs.
PO4	**Conduct investigations of complex problems:** An ability to design and perform experiments of complex electronic circuits and systems, analyse and interpret data to provide valid conclusions.
PO5	**Modern tool usage:** An ability to learn, select and apply appropriate techniques, resources and modern engineering tools for modelling complex engineering systems.
PO6	**The engineer and society:** Knowledge of contemporary issues to assess the societal responsibilities relevant to the professional practice.
PO7	**Environment and sustainability:** An ability to understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.
PO8	**Ethics:** An understanding of professional and ethical responsibilities and norms of engineering practice.
PO9	**Individual and team work:** An ability to function effectively as an individual, and as a member in diverse teams and in multidisciplinary settings.
PO10	**Communication:** An ability to communicate effectively with engineering community and with society at large.
PO11	**Project management and finance:** An ability to demonstrate knowledge and understanding of engineering and management principles and apply these to manage projects.
PO12	**Life-long learning:** An ability to recognize the need for, and engage in independent and life-long learning in the broadest context of technological change.