

Date: 17/02/2020

To,  
The Principal  
ATMECE, Mysuru.

Respected sir,

**Subject: Permission to attend two-day training program on "AICTE/MHRD's  
INNOVATION AMBASSIDOR TRAINING PROGRAM" Reg.**

With reference to the above subject ACS College of Engineering, Bengaluru is organizing two-day training program on "AICTE/MHRD's INNOVATION AMBASSIDOR TRAINING PROGRAM" being conducted for Institute's Innovation Council (IIC) in south zone during 26<sup>th</sup> and 27<sup>th</sup> February, 2020. It is required to attend the said program under IIC to understand the complete process of IIC and to take forward the activities in our institution under IIC. The following staff members may be deputed for the said program. Parallel sessions on Pre- incubation & Incubation Management, IPR & Technology Transfer, Design thinking and Innovations, Entrepreneurship Development Program are going to be held during the program. The following faculty are identified to attend the program,

Pre- incubation & Incubation Management – Dr. Rathnakar G.

IPR & Technology Transfer – Mr. Mohanakumara K C

Design thinking and Innovations – Mr. Swarnakiran S

Entrepreneurship Development Program – Mr. Yashwanth N

Hence in this regard I request your kind good self to sanction permission to attend the training program and do needful.

Thanking you


Yours faithfully

*A Rathnakar*  
17/02/2020

\* Permitted to attend two days  
training program on 26<sup>th</sup> & 27<sup>th</sup> Feb 2020.

\* Arrange arrangements to be  
done for classes.

*[Signature]*  
17/2/2020

 <b>VASANTH SERVICE STATION</b> Dealer : Indian Oil Corporation LTD. Opp. NIE College, Manandavadi Road, MYSORE - 8 Ph.: 2483689, 4256744		<b>TAX INVOICE</b>		
Vehicle No.: <b>IND</b> Time : <b>08:28 PM</b> GSTIN:- Customer :		<b>CASH / CREDIT BILL</b> No. : <b>CS-9044</b> Date : <b>25/02/2020</b>		
S.No.	PRODUCT	QTY	RATE	VALUE
	PETROL	33.74	74.10	2500.00
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**A T M E**  
**College of Engineering**  
 13th Kilometer, Mysore-Bannur Road, Mysore - 570 028



No. **1625**

**VOUCHER**

Date : **05/03/2020**

Name of Work : **ATTEND TWO DAY TRAINING PROGRAM ON AICTE / MHRD'S INNOVATION AMBASSADOR TRAINING PROGRAM**

Name of the Party : **Dr. Rathnakar. G, Mr. Mohanakumarake, Mr. Swarnaknans**

Received with thanks a sum of Rs. **2500/-** (Rupees **TWO thousand & Five hundred only**) as advance / part / full payment towards **attend two day training program on AICTE / MHRD'S Innovation Ambassador training program at ACS College of Engineering - Bangalore, during 26<sup>th</sup> & 27<sup>th</sup> Feb 2020**

by ~~Cash~~ / Cheque no. **201530**

*C. Rathnakar*  
 Receiver's Signature **05/03/2020**

For, **A T M E**

*[Signature]*  
 Authorised Signatory



## **Report on IIC Innovation Ambassador Training Series**

Institution's Innovation Council of MHRD's Innovation Cell, AICTE has organized an Innovation Ambassador Training Program for Institution Innovation Councils of Higher Education Institutions on 26<sup>th</sup> and 27<sup>th</sup> February, 2020 at ACS College of Engineering, Bengaluru.

Four Faculty Members from ATME College of Engineering, Mysuru have undergone training of Innovation Ambassadors. The Details of training and faculty members are as mentioned below.

- 1) Dr. Rathnakar G - "Pre- Incubations & Incubation Management"
- 2) Mr. Mohanakumara K C - "IPR & Technology Transfer"
- 3) Mr. Yashwanth N - "Entrepreneurship Development Program"
- 4) Mr. Swarnakiran S - "Design thinking & Innovations"

### **Day 1:**

**Dr. Lalith Sharma**, Faculty, Entrepreneurship Development Institute of India, Ahmedabad was the resource person of the day. They have provided knowledge on various topics including,

- Concepts and Elements of Entrepreneurship
- Enabling Youth Entrepreneurship through Innovation
- Entrepreneurship Ecosystem in the Country
- Entrepreneurial Mindset

### **Day 2:**

**Prof. Koppada Kiran**, Faculty, Entrepreneurship Development Institute of India, Ahmedabad was the resource person on the day 2. They provided the detail information regarding the stages of Entrepreneurship developments including,

- Idea to Enterprise Creation
- Entrepreneurship Competency Development
- Business Model Criterion
- Social Media Entrepreneurship

The Event provided an exposure and idea to various aspects of Innovation and Entrepreneurship for the faculties of Higher Education Institutions. The successful participants were provided with Innovation Ambassador Badges at the end of the program and advised to the responsibility of creating an Innovation based ecosystem at their respective institutions.

Image Gallery:

**RAJARAJESWARI GROUP OF INSTITUTIONS**  
BENGALURU, KARNATAKA

MHRD'S INNOVATION CELL (GOVERNMENT OF INDIA)   INSTITUTION'S INNOVATION COUNCIL

  RajaRajeswari Business Incubator

**Innovation Ambassador Training Series**  
**Entrepreneurship Development Program**  
**26<sup>th</sup> - 27<sup>th</sup> Feb 2020 Venue: Kadamba Hall (Ground Floor)**

Duration	Expert Name	Topics
11:30AM - 5:30 PM (Day 1)	Dr. Lalit Sharma Faculty EDII	1:00 AM to 12:00 PM - Concept & Elements of Entrepreneurship 01:00 PM to 02:00 PM - Enabling Youth Entrepreneurship through Innovation 3:00 PM to 4:00 PM - Entrepreneurship Ecosystem in the country We can replace any of the above topics with the following topic (4:00 PM to 4:45 PM) (4:45 PM to 5:30 PM) - Entrepreneurial Mindset
06:45 pm - Cultural Program followed by Dinner End of Day 1 Session		
9:30AM - 5:30PM (Day 2)	Prof. Koppada Kiran Faculty EDII	9:30AM to 10:45 AM - Idea to enterprise creation 11 AM to 1:00PM - Entrepreneurship Competency Development 2:00 PM to 3:15PM - Business Model Creation 3:30 PM to 4:30PM - Social Media Entrepreneurship 4:30 PM to 5:30 PM - Q&A
End of Program		



## CERTIFICATE OF PARTICIPATION

**Dr RATHNAKAR G**

Academy for Technical and Management Excellence, MYSORE

Successfully Completed Training on "Pre- Incubations & Incubation Management" conducted as part of

**IIC Innovation Ambassador Training Series**

Organized by Institution's Innovation Council of MHRD's Innovation Cell, AICTE held at  
ACS College of Engineering, Bangalore, Karnataka on 26-27 February 2020.

Prof. Anil D. Sahasrabudhe  
Chairman  
AICTE

Prof. M.P. Poonia  
Vice Chairman  
AICTE

Dr. Abhay Jere  
Chief Innovation Officer  
MHRD's Innovation Cell



scan to verify

eCertificate No : 1309

Date of issue: 09-03-2020



## CERTIFICATE OF PARTICIPATION

**Mohana Kumara K C**

Academy for Technical and Management Excellence, MYSORE

Successfully Completed Training on "IPR & Technology Transfer" conducted as part of

**IIC Innovation Ambassador Training Series**

Organized by Institution's Innovation Council of MHRD's Innovation Cell, AICTE held at  
ACS College of Engineering, Bangalore, Karnataka on 26-27 February 2020.

Prof. Anil D. Sahasrabudhe  
Chairman  
AICTE

Prof. M.P. Poonia  
Vice Chairman  
AICTE

Dr. Abhay Jere  
Chief Innovation Officer  
MHRD's Innovation Cell



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eCertificate No : 1337

Date of issue: 09-03-2020





## CERTIFICATE OF PARTICIPATION

**YASHWANTH N**

Academy for Technical and Management Excellence, MYSORE

Successfully Completed Training on "Entrepreneurship Development Program" conducted as part of

**IIC Innovation Ambassador Training Series**

Organized by Institution's Innovation Council of MHRD's Innovation Cell, AICTE held at  
ACS College of Engineering, Bangalore, Karnataka on 26-27 February 2020.

Prof. Anil D. Sahasrabudhe  
Chairman  
AICTE

Prof. M.P. Poonia  
Vice Chairman  
AICTE

Dr. Abhay Jere  
Chief Innovation Officer  
MHRD's Innovation Cell



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eCertificate No : 1321

Date of issue: 09-03-2020



## CERTIFICATE OF PARTICIPATION

**Swarnakiran S**

Academy for Technical and Management Excellence, MYSORE

Successfully Completed Training on "Design thinking & Innovations" conducted as part of

**IIC Innovation Ambassador Training Series**

Organized by Institution's Innovation Council of MHRD's Innovation Cell, AICTE held at  
ACS College of Engineering, Bangalore, Karnataka on 26-27 February 2020.

Prof. Anil D. Sahasrabudhe  
Chairman  
AICTE

Prof. M.P. Poonia  
Vice Chairman  
AICTE

Dr. Abhay Jere  
Chief Innovation Officer  
MHRD's Innovation Cell



scan to verify

eCertificate No : 1322

Date of issue: 09-03-2020

Mysuru  
23/12/19

From

Sneha. N.P

Asst. Prof.

Dept of CSE

ATMECE, Mysuru

To

The Principal

ATMECE, Mysuru

Through

The HoD

Dept of CSE

ATMECE, Mysuru.

Respected Sir

Subject : Requesting to grant permission to attend  
FDP from 6/01/20 to 10/01/20.

With respect to the above subject I would like to attend FDP on "Modern web Application Development using MEAN stack" organised by department of CSE, Ramaiah Institute of Technology, Bengaluru from 6/01/2020 to 10/01/2020. So I kindly request you to grant <sup>me</sup> permission to attend the FDP. Kindly oblige and do the needful.

Thanking you

Yours faithfully  
al

Forwarded for your kind  
approval.

Crowle

Check no: 201166 23/12/19.

Received  
al Snehap

Approved

Kul  
23/12/19



# RAMAIAH

Institute of Technology

Department of Computer Science & Engineering

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## ACKNOWLEDGEMENT

This is to certify that Mr./Ms. SNEHA-N-P attended the Five-Days FDP on "Modern Web Application Development using MEAN Stack" held from 06-10-2020 to 10-10-2020 at Ramaiah Institute of Technology, Bangalore and Rs. 1000/- has been received towards the Registration Fee.

A handwritten signature in blue ink, appearing to read 'Ane'.

Professor & Head  
Department of CSE

RIT

Professor & Head

Dept. of Computer Science and Engg.  
Ramaiah Institute of Technology  
(Autonomous Institute, Affiliated to VTU)  
Bangalore - 560 054





**RAMAIAH**  
Institute of Technology

## Certificate of Participation

This is to certify that Dr./Mr./Ms.....*SNEHA N. P.*.....  
of.....*ATME College of Engineering*.....has  
participated Five Days Faculty Development Programme on **“Modern Web  
Application Development using MEAN Stack”** jointly organized by the  
Departments of Computer Science & Engineering, Information Science &  
Engineering and Master of Computer Applications from 6<sup>th</sup> – 10<sup>th</sup> January, 2020.

Dr. Yogish H K  
Professor & Head  
Dept. of MCA, RIT

Dr. Vijaya Kumar B P  
Professor & Head  
Dept. of ISE, RIT

Dr. Anita Kanavalli  
Professor & Head  
Dept. of CSE, RIT

Dr. N.V.R. Naidu  
Principal  
RIT, Bengaluru



Date: 11/02/2020

From,  
M S Sunitha Patel  
Assistant Professor  
Department of CSE  
ATMECE, Mysuru

To,  
The Principal  
ATMECE, Mysuru

Through,  
The HOD  
Department of CSE

Respected Sir,


**Sub:** Requisition to grant Registration amount for "iCASIC -2020"

This is to bring to your kind notice that the paper entitled "**Soft Computing Approaches for Automotive Image Processing: Opportunities & Challenges**" authored by me, has been accepted and selected for oral presentation at "**The International Conference on Automation, Signal Processing, Instrumentation and Control (iCASIC 2020)**", scheduled to be conducted at Vellore Institute of Technology Vellore, Tamilnadu on 27<sup>th</sup> and 28<sup>th</sup> Feb 2020(details enclosed). Accepted papers will be published in **Springer Proceedings**.

Further, I request you to sanction the registration amount of Rs.7,000/- (Seven Thousand Rupees Only) and permit me to attend the conference and oblige.

Thanking You,


Approved

  
11/2/2020

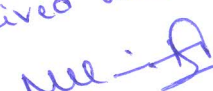
Yours Faithfully,

  
M S Sunitha Patel

Forwarded

  
HOD 11/2/2020

Dept. of Computer Science & Engg  
ATME College of Engineering  
Mysuru-570028

Received amount Rs. 7000/-  
  
14/2/2020





**VIT<sup>®</sup>**  
Vellore Institute of Technology  
(Deemed to be University under section 3 of UGC Act, 1956)



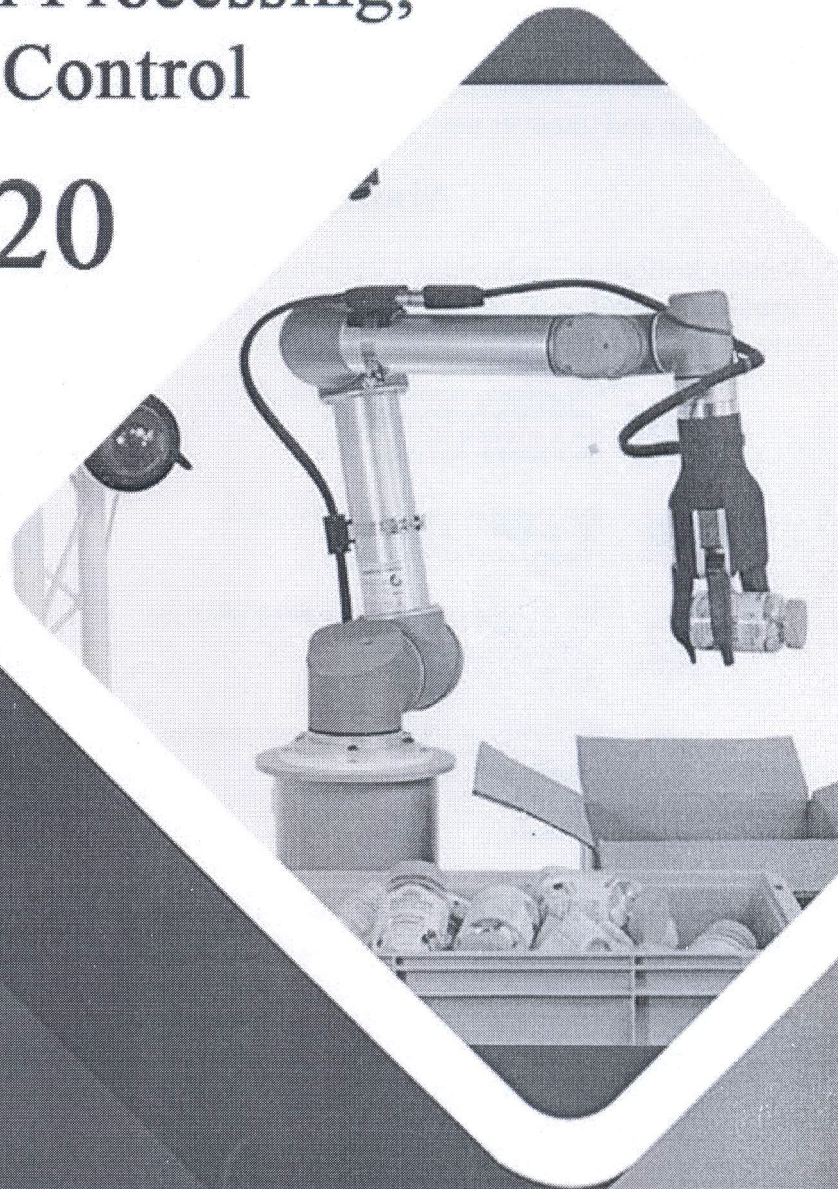
# International Conference on Automation, Signal Processing, Instrumentation & Control


## iCASIC 2020

27 & 28  
February  
2020

Organized by:  
**School of Electrical  
Engineering**


In association with  
**International Society of  
Automation**



 VIT Vellore, Tamil Nadu, India

 [icasic2020@vit.ac.in](mailto:icasic2020@vit.ac.in)

 [www.icasic2020.in](http://www.icasic2020.in)

 9486750593, 9003542499





## About iCASIC 2020

The International conference on Automation, Signal Processing, Instrumentation and Control (iCASIC 2020) intend to bring together scientists, engineers, researchers, industry leaders, and scholars in all areas of Engineering and Technology. The aim is to create a platform for open communication and idea exchange on the recent Technological and Engineering developments. This conference provides an international forum for sharing knowledge and innovation in the field of Instrumentation, Control and Automation, Electrical, Electronics and Communication. This also aims to encourage intellectual development and providing opportunities for networking and collaboration. Networking enables sharpening of research skills, spark inspiration and uncover new ideas.

## About Vellore Institute of Technology

Vellore Institute of Technology (VIT) founded in 1984 as Vellore Engineering College by Dr. G. Viswanathan, the founder Chancellor of the Institute. VIT attracts students from all the states of India and more than 51 different countries because of its academic excellence.



NIRF (National Institutional Ranking Framework)  
• No. 16 in Engineering Institution - 2018  
• No. 16 in University Category - 2018  
• No. 29 in Management Institution - 2018



NAAC (National Assessment and Accreditation Council)  
• Accredited in 2015 - A Grade  
• Completed 3 cycles of Accreditation



ABET (Accreditation Board for Engineering and Technology), USA  
• 3 Times Accredited  
• 10 B. Tech Programs - Vellore Campus  
• 4 B. Tech Programs - Chennai Campus



FICCI (Federation of Indian Chambers of Commerce & Industry)  
• "Excellence in Faculty" - 2017  
• "University of the Year" - 2016



UGC Granted



QS RATING 2016  
• 4 Star Overall Rating in 2016  
• Got 5 STAR Rating for 5 Sub Categories (Teaching, Employability, Facilities, Innovation and Inclusiveness)  
• First University in India to get QS 4 Star Rating



THE RANKING  
• Ranked in the Top 251-300 in 2018. (Asia Ranking)



QS BRICS UNIVERSITY RANKING  
• 3 Times Accredited  
• 10 B. Tech Programs - Vellore Campus  
• 4 B. Tech Programs - Chennai Campus



QS IGAUGE  
• Got Diamond University Rating in 2018



ACBSP (The Accreditation Council for Business Schools and Programs), USA

VIT has introduced many **innovations** in academics processes which adds value to every student. **FFCS** (Fully Flexible Credit System), **PBL** (Project Based Learning) for better learning, **fully digitalized** academic portals that assists student in equipping themselves with, for 2020 market place, **Hackathons/Makeathons** as part of curriculum exercise which kindles the interest and the curiosity of students, which moulds them to be better problem solver, **8<sup>th</sup> module in every subject being handled by industry experts**, making the students contextualize the concepts they study in the classroom, are a few of the innovations that VIT has introduced.

## About International Society of Automation

The International Society of Automation is a non-profit professional association that sets the standard for those who apply engineering and technology to improve the management, safety and cyber security of modern automation and control systems used across the industry and critical infrastructure. ISA was founded in 1945, it develops widely used global standards and certifies industry professionals. It provides education and training by publishing books, technical articles, hosting conferences and exhibitions and provides networking and career development programs for its 40,000 members and 400,000 customers around the world.

ISA-VIT was established in the year 2010 as a multidisciplinary student section under ISA Bangalore, is one of the 9 active sections of District 14, which comprises of India, Japan, Singapore, Korea & Malaysia. The main objective of ISA-VIT is to ensure technical development as well as management skills, leadership and intrapersonal development of all its members.



## Original Contributions

are solicited on topics covered on broad areas not restricted to

### Instrumentation

- Analytical & Virtual Instrumentation
- MEMS & Nano Sensors
- Bio & Chemical Sensors
- Sensors Fusion
- Tomography & Imaging Techniques
- IOT based Instrumentation
- Nano Photonic & Optical Sensors
- Machine Learning & Wireless Sensors

### Control & Automation

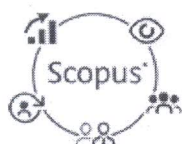
- Fuzzy & Neural based Control System
- Robotics & Automation
- Fault Detection & Diagnosis
- Hybrid System & Modelling Design
- System Identification and Selection
- Distributive, Cooperative & Network Control System

### Electronics & Communication

- Signal & Image Processing
- Nano Technology
- Semiconductor Devices & VLSI
- Parallel & Distributed Computing Statistic Learning & Pattern Recognition
- Wireless Communication
- Computer Networks and Security
- Embedded Systems
- Cognitive System Research

### Electrical

- Smart Grid
- Soft Computing Technology
- Green and Renewable Energy Techniques
- Electrical Power System
- E-Vehicle Technology
- Electrical Drives
- Power Converters & Inverters
- Energy Management System



Selected Papers published  
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Top Notch Papers published  
in ISA Transactions



All Papers published  
in Springer proceedings

## Registration Details

CATEGORY	Registration Fees	
	ISA Members	Non - ISA Members
Faculty/Industry Professionals	Rs. 6,000	Rs. 7,000
Research Scholars, UG & PG Students	Rs. 4,000	Rs. 5,000
Foreign Delegates	100 USD	150 USD



Having a motto of “Enlightening Minds!” we at ISA-VIT host various workshops, speaker sessions, technitudes, industrial visits, and outreach events in various schools, and annual tech-fest SPARK, it’s annual flagship event - an amalgamation of technology and science, an opportunity for budding engineers to learn and apply, gain awareness on safety, and cybersecurity of modern automation tools used across industry and critical infrastructure, raise questions and get answers. It is a chance to form and strengthen friendships, professionalism, organizational and management skills. ISA – VIT consistently gets many laurels from District-14 & USA-HQ in the form of best chapter, best student member and best mentor. ISA-VIT has been recognized as the best student section under ISA Bangalore for the 3 consecutive years & our faculty advisor Dr. Vivekanandan S was honoured as the best faculty mentor at the 55<sup>th</sup> GALA in Tampa Bay, Florida, USA.

## About School of Electrical Engineering

The School of Electrical Engineering (SELECT) has 109 faculty members who have done their UG and PG degrees from the top-notch universities. The School offers B.Tech (Electronics and Instrumentation Engineering), B.Tech (Electrical and Electronics Engineering), FIST sponsored M.Tech programme in Power and Energy and M. Tech programme in Control and Automation, M.Tech. by Research and Ph.D. in Engineering. B.Tech (Electronics and Instrumentation Engineering) and B.Tech (Electrical and Electronics Engineering), is accredited by the Engineering Accreditation Commission of ABET. All UG & PG programs of the school are accredited by the Institution of Engineering and Technology (IET), U.K.

The Placement record of the School has always been very impressive. Almost 100% of the students get job from the campus placement and many of them are getting it in core companies every year. The School has state-of-the art laboratories in almost all the areas of Electrical, Instrumentation and Electronics Engineering. Every year, students get scholarships to do their final year projects abroad under the Semester Abroad Programme (SAP).

Danfoss India, Schneider Electric, Q-Max, National Instruments and Fluke Test and Calibration have established Center of Excellence for students R&D activities under the guidance of faculty members and Industry Experts. The School has signed MoUs with many foreign universities, research organizations and Industries from where students get benefits for their R&D work/projects from the MoUs.

## Manuscript Submission

- All manuscripts should be submitted through <https://easychair.org/conferences/?conf=icasic2020>
- All submitted paper will go through plagiarism check process
- Manuscript should not contain embedded links, scanned images, header and footer
- Email submissions will not be accepted
- 50% concession for second paper by the same author
- All queries related to the conference shall be addressed to [icasic2020@vit.ac.in](mailto:icasic2020@vit.ac.in)

## Important Dates

- |                                 |   |
|---------------------------------|---|
| • Full Paper Submission         | : 29 <sup>th</sup> October 2019                     |
| • Notification of Acceptance    | : 26 <sup>th</sup> November 2019                    |
| • Camera Ready Paper Submission | : 17 <sup>th</sup> December 2019                    |
| • Conference Dates              | : 27 <sup>th</sup> & 28 <sup>th</sup> February 2020 |



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**Dr. Chandan Kumar Sarkar**, Jadavpur University, Bengal, India.

**Dr. Surya Prakash**, IIT Indore, Madhya Pradesh, India.

**Dr. N. Sivakumaran**, NIT Trichy, Tamil Nadu, India.

**Dr. Rajesh Joseph Abraham**, IIST, Thiruvananthapuram, Kerala, India.

**Dr. N. Selvaganesan**, IIST, Thiruvananthapuram, Kerala, India.

**Dr. Porkumaran**, Dr. N.G.P. Institute of Technology, Coimbatore, Tamil Nadu, India.

**Mr. Rajesh Rath**, President, ISA-D14, Bengaluru, Karnataka, India.

**Mr. Rajshekhar Uchil**, ISA, Bengaluru, Karnataka, India.

**Mr. Ram V Kerur**, ISA, Bengaluru, Karnataka, India.

**Mr. Sunil S Shah**, ISA, Bengaluru, Karnataka, India.

**Mr. S. R. Sabapathi**, Founder & CEO, QMAX Technologies, Chennai, Tamil Nadu, India.

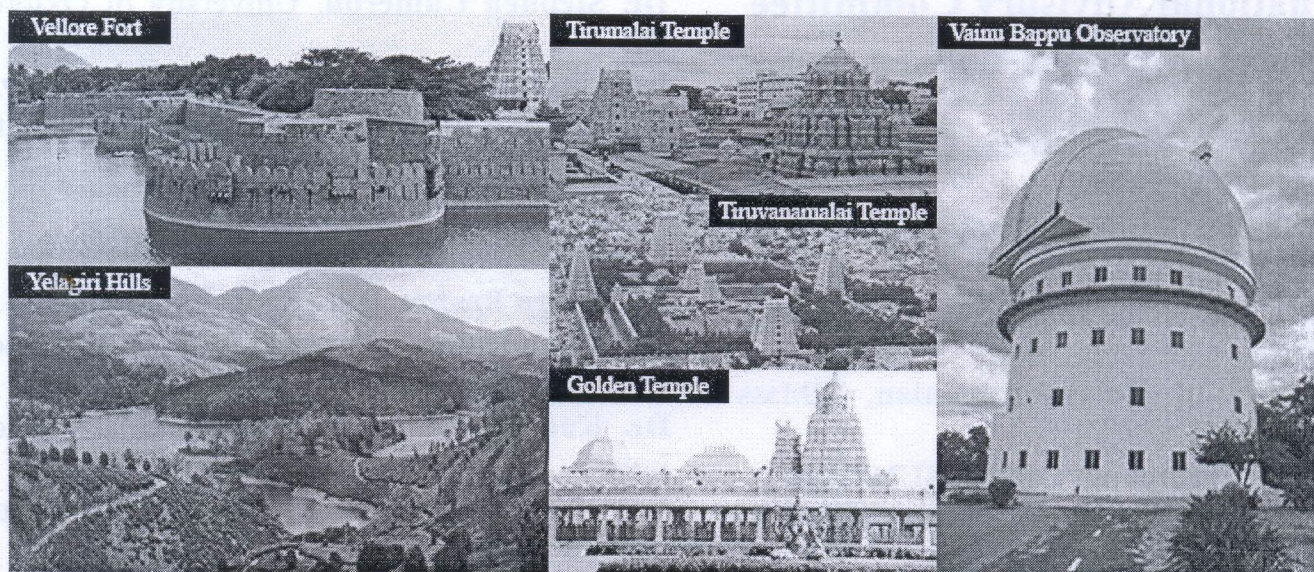
**Mr. P. V. Prabhakaran**, Fluke Technologies Pvt. Ltd., Bengaluru, Karnataka, India.

**Dr. V. S. N. Rao Tatavarti**, GVP College of Engineering, Visakhapatnam, Andhra Pradesh, India.

**Dr. E. R. Rajkumar**, Robert Bosch, Bengaluru, Karnataka, India.



## Places to visit near Vellore



Vellore is popular and one of the oldest cities of South India. It is the administrative headquarters of Vellore District in Tamil Nadu situated on the banks of Palar River. Vellore is popularly known as the Fort City of Tamil Nadu. The name Vellore also means a City of Spears, Vellore has an enriching legacy reflecting the early Dravidian Culture. It has been ruled by the Pallavs, Cholas, Vijaynagara Empire, Rashtrakutas, Carnatic Kingdom and the British.

Vellore has many historic and religious attractions. The famous Sripuram Sri Lakshmi Golden Temple is situated near Vellore. The Vellore Fort has prime attraction in the town completely made of granite stone. The Fort might have been built during the rule of Chinna Bommi Nayak (1526 AD to 1595 AD). The Fort is one of the most perfect specimens of Military Architecture in South India. The other important attractions of Vellore includes the Clock Tower, the State Government Museum, the French Bungalow, Science Park, Vainu Bappu Observatory, Amrithi Zoological Park, Big Mosque, St. Johns Church, Delhi Gate and the Pearl Palace

**Dr. S. Sivabalan**

**Organizing Chair**

Email: [dean.select@vit.ac.in](mailto:dean.select@vit.ac.in)

Phone: 9894681056

**Dr. P. Arulmozhivarman**

**Conference Chair**

Email: [parulmozhivarman@vit.ac.in](mailto:parulmozhivarman@vit.ac.in)

Phone: 9443311373

**Dr. N. Amutha Prabha**

**Conference Co-Chair**

Email: [amuthaprabha@vit.ac.in](mailto:amuthaprabha@vit.ac.in)

Phone: 9486750593

**Dr. K. V. L. Narayana**

**Publications Chair**

Email: [vnarayana.k@vit.ac.in](mailto:vnarayana.k@vit.ac.in)

Phone: 9790763938

**Dr. S. Vivekanandan**

**Conference Chair**

Email: [svivekanandan@vit.ac.in](mailto:svivekanandan@vit.ac.in)

Phone: 8124274447

**Dr. G. Abhishek**

**Conference Co-Chair**

Email: [abhishek.g@vit.ac.in](mailto:abhishek.g@vit.ac.in)

Phone: 9003542499

**Mr. Jaganatha Pandian**

**Finance Chair**

Email: [jaganathapandian@vit.ac.in](mailto:jaganathapandian@vit.ac.in)

Phone: 9840571695





**VIT**  
Vellore Institute of Technology  
Vellore Institute of Technology is an ISO 9001:2015 Certified



**International Conference on Automation, Signal Processing, Instrumentation  
and Control iCASIC-2020**

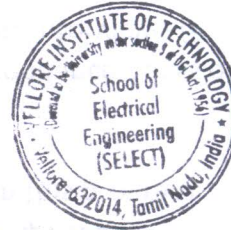
Date: 28/2/2020

Received Rs. 2,000/- from \_\_\_\_\_

M S Sunitha Patel, Asst Prof, ATMECE towards  
Registration fee for iCASIC 2020

Finance Chair  
(iCASIC 2020)

*Soni*





**VIT**  
Vellore Institute of Technology  
(Deemed to be University under section 3 of UGC Act 1956)

**iCASIC 2020**

**Registration Acknowledgement - Receipt**

Date of the Conference	27 <sup>th</sup> & 28 <sup>th</sup> February 2020
Reference No.	ICAS086694
Name	M S SUNITHA PATEL
Mobile No.	9986041490
Email address	mssunithapatel@gmail.com
Fee	5000
Payment done through	Netbanking / Credit Card / Debit Card
Transaction No.	973512576
Bank Ref.No.	ICAS086694
Payment Date	17-12-2019 02:53:59
<u>Important Instruction</u>	
<ul style="list-style-type: none"><li>• Please bring this acknowledgment receipt for the conference.</li><li>• In Addition to the above total amount bank charges will be debited.</li></ul>	



# CERTIFICATE OF PRESENTATION

## International Conference on Automation, Signal Processing, Instrumentation and Control (iCASIC 2020)

This is to certify that Prof./~~Dr.~~/~~Mr.~~/~~Ms.~~/~~Mrs.~~ M S SUNITHA PATEL, Asst. Prof.  
of ATME College of Engineering, Mysuru has presented a paper titled  
Soft Computing Approaches for Automotive Image Processing: Opportunities & Challenges

in the International Conference on Automation, Signal Processing, Instrumentation and Control  
(iCASIC 2020) held on 27<sup>th</sup> - 28<sup>th</sup> February 2020 at Vellore Institute of Technology, Vellore, India.

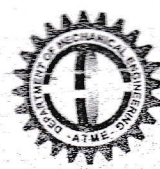
P-ID:148

  
**President ISA D-14**

  
**Conference Chair**

  
**Convener**





30/01/2020

To,  
The Principal,  
ATME College of Engineering  
Mysuru-28

Sub.: Requesting permission to attend Karnataka Tech-Entrepreneurship Summit-2020, to be held on 13<sup>th</sup>, 14<sup>th</sup>, & 15<sup>th</sup> February at JNNCE Shivamogga.

Respected Sir,

With reference to the above subject we request your kind good self to kindly permit us to attend Karnataka Tech-Entrepreneurship Summit -2020 to be held at JNNCE Shivamogga from 13<sup>th</sup> - 15<sup>th</sup> February 2020. The Entrepreneur ship summit focuses to provide information on the functioning of the incubation centre, Start up Eco system, Technology & business leaders meet, policy makers, education and research experts, entrepreneurs, companies, investor's summit.

As there is a probable possibility that our institution may get an Incubation Centre From K-Tech it is necessary to acquire the required skill sets to conduct similar such programs in future in our institution.

In this regard request you to provide financial assistance for the registration, travel and Accommodation expenditures.

Attached the information brochure for your reference.

Thanking you

Yours Faithfully

1. Dr. Rathnakar.G
2. Mr. Mohanakumara K C
3. Mr. Niranjan Kumar V S

*Li Rathnakar*  
*Mohale* 30/01/2020  
*Nishant* 30/01/2020

2000/-  
1000/-  
1000/-  
4000/-

Registration  
Fee -

Transportation and accommodation 2000/-

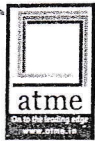
Forwarded to the Honble Chairman  
for kind information and approval

*Approved*

*30/01/2020*

*30/01/2020*





# A T M E

College of Engineering  
13th Kilometer, Mysore-Bannur Road, Mysore - 570 028



## VOUCHER

No. **1624**

Date: **29/02/2020**

Name of Work: **Karnataka Tech Entrepreneurship Summit - 2020**

Head of Account :

Name of the Party: **Mr. Niranjan Kumar, V S**

Received with thanks a sum of Rs. **5295/-** (Rupees **Five thousand two hundred**

**only five only**) as advance / part / full payment towards **attended Karnataka Tech Entrepreneurship Summit - 2020 at InnCE, Shivamogga on 13<sup>th</sup> to 15 Feb 2020, with Mr. Mohanakumar & Mr. Yeswanth, n**

by ~~Cash~~ / Cheque no. **201529**

For, **A T M E**



Receiver's Signature

Authorised Signatory



# K-Tech Entrepreneurship Summit – 2020

**Location:** JNNCE, Shimoga

**Duration:** 13<sup>th</sup> – 15<sup>th</sup> Feb, 2020

**Faculties attended:** Mr. Niranjan Kumar V S

Mr. Mohanakumar K C

Mr. Yashwanth N

A three-day Entrepreneurship summit KTES 2020 was held during 13<sup>th</sup> to 15<sup>th</sup> February 2020 at JNNCE, Shimoga. The event was organized with the focus on building start-up ecosystem and entrepreneurship spirit in tier-2 and tier-3 cities.

## Objectives of KTES – 2020

- To bring together academic community, venture capitalists, new age entrepreneurs and all those passionate about entrepreneurship on to a common platform.
- To examine and explore different facets of issues surrounding entrepreneurship in the era of innovation.
- To deliberate on all relevant issues that include innovation on products and services as well as process and strategy.
- To embed the culture of entrepreneurship in the young minds to create a better future.





## **Day 1:**

The event was inaugurated by Chief Guest Dr. C N Ashwatha Narayana, Deputy Chief Minister, Govt. of Karnataka. In his speech he highlighted the importance of job creation mindset among the young engineers and various supporting facilities in the form of incubators and finance provided by both Govt. of Karnataka and Govt. of India.

Later, Keynote Talk was delivered by Mr. Nagaraja Prakasam, Partner Acumen Fund and Startup Advisor. He addressed the gathering on a topic “Ignoring the Billion”. He told as a developing nation we are in need of lots of services and new products for the well-being of our population, but majority of them have been ignored and urged students and young entrepreneurs to focus on solving problems in tier-2 and tier-3 cities.

Further, Mr. Ajay Muttreja, Advisor & Mentor to Startups, VC, COE, ICCo, CEE, FICCI addressed the gathering on “Importance of Mentoring in Startups” and also educated students on qualities that a successful entrepreneur should possess.

In the afternoon, Mr. Mahesha B R Pandit, Founder & CTO, Rhytify Technologies Pvt. Ltd., spoke on “Opportunities in India: 15 Trillion and beyond”. In his session he shared his experiences on the potential market in tier-2 and tier-3 cities, which can contribute in nations growth and achieving even 15 trillion economy in the upcoming years.

Later a panel discussion was held between Angel investors, entrepreneurs, mentors, Venture capitalists on “Funding scenario in India and Future Opportunities for Tier2/Tier3 cities”. The panel was lead by Mr. Samir Kumar, Managing Director, Inventus India, Bangalore.

Finally, the day was concluded with a workshop on “Idea to Enterprise” by Mr. Suman Sengupta, Head of Professional Services, Lead Angels, Mumbai.

## **Day 2:**

The day started with an invited talk on “Idea to Exit: How to build a successful company” by Mr. Arun Rao, Founder & CTO, GrandCanals & Director of Parcel solutions at C H Robinson, Sunnyvale, California. Mr. Arun Rao was an Alumni of JNNCE. He shared his entrepreneurial journey from building a team to making a successful startup in logistics sector.

Later, Dr. M H Balasubrahmanya, Professor, Dept of Management Studies, IISc, Bangalore spoke on “Ideation, Innovation, Commercialization and Venture Creation: An Indian Academic Model”. In his speech he explained how IIT Madras, has grown from a mere sand box to most successful startup incubator in the country.

In the afternoon a workshop was conducted by Mr. Sumath Parimal, Founding Partner and Chief Analyst of 5 Jewels Research at Innogress, New Dehli & Ex-IDC Analyst. He is also a JNNCE Alumni. He spoke on “Disruptive Tech Startups enabling 5 Trillion Indian economy”.

Later a panel discussion was held among the resource people invited for the event which included, Industry representative, women entrepreneur, and 2<sup>nd</sup> generation entrepreneurs. The team was lead by Dr. M H Balasubrahmanya. The panel held a discussion on “Entrpreneurship: Moving out of comfort zone”



Finally, the day was concluded by conducting a workshop on hackathon. Where students have given with the problem statements and generate innovative ideas and converting them into a feasible solution.

### **Day 3:**

**The** final day of the event started with a workshop on “Business Plan Writing: Pitch your product”. The event was conducted by Mr. Dheer Lalith Gupta, Founder & Director, Green Bubbles Technologies Pvt Ltd and Mr. BSLN Murthy, CEO, Rhtify, Bangalore. Students got necessary advice and mentoring on how to prepare business plans and how to pitch them to the investors for appropriate funding.

Later, Padmashree Dr. Prahlada, Former Vice Chancellor, Defense Institute of Advanced Technology (DIAT), Pune were invited to speak on Industry 4.0, Manufacturing, Defense: Opportunities. He spoke about the importance tech based startups and importance of awareness regarding industry 4.0 manufacturing.

In the afternoon, Dr. S Rangarajan, Former Director, ISRO & CTO, Yazmi Solution, USA spoke on startup opportunities in the field of space and automotive sectors.

The event finally came to an end with the valedictory function with summarizing the importance and objectives achieved over a period of 3 days of the summit.

### **Expected Outcomes:**

- To bring together different facets of issues surrounding entrepreneurship in the era of innovation in tier 2 & tier 3 cities
- Opportunities for the promotion of startups and entrepreneurship
- Commercialization of research and development
- To foster entrepreneurial initiatives and activities in the campus and off campus
- Provide the platform for the aspiring entrepreneurs to have hands-on experience before they can finally enter the market
- Adoption of knowledge for innovation and technology transfer
- It brings together the academic community, venture capitalists, new age entrepreneurs and all those passionate about entrepreneurship to a common ground

Date: 30-01-2020

**From:**

Dr. Yathisha L, Associate Professor  
Mrs. Nasreen Fathima, Assistant Professor  
ATMECE, Mysuru

**To,**

The Principal  
ATMECE  
Mysuru.

**Respected Sir,**

**Sub:** QS University Ranking and Rating workshop details

As per the email dated 9<sup>th</sup> January 2020, we have attended One day workshop at IISc, Bengaluru on the topic "**QS University Rankings and Ratings National Workshop for India**" on 20th January 2020. Please find attached expenses incurred for attending the workshop with detail bills and certificates. Kindly sanction the expenses incurred and oblige.

Thanking You,

Yours sincerely,

*Yathisha L*  
(Dr. YATHISHA. L)  
*Nasreen*

→ Cheque No: 937502

Received  
*Yathisha L*  
(Dr. YATHISHA. L)  
30/1/2020



Expenses Incurred towards attending One day workshop at IISc, Bengaluru on  
the topic

**"QS University Rankings and Ratings National Workshop for India" on**

20th January 2020

Sl. No.	Particulars	Amount
1	Taxi / Cab Fare	Rs.1054/-
2	Bus / Train Fare	Rs. 1030/-
3	Breakfast/Tea	Rs. 74/-

**Total Expense = Rs. 2158/-**

**(Two Thousand One Hundred and Fifty Eight Only)**

TO  
OS/AK.  
Rs. 2158/-  
30/1/2020.

Nayath  
30/01/2020

# CERTIFICATE OF COMPLETION



This certifies that

**Dr Yathisha L**

has successfully attended a full day workshop on  
**QS Rankings & Ratings** on 20 January 2020 at the  
**Indian Institute of Science (IISc)**, Bangalore; sponsored  
by **SRM Institute of Science & Technology (SRMIST)**

A handwritten signature in black ink, appearing to read 'Ben Sowter', written over a horizontal line.

**BEN SOWTER**

Senior Vice President, QS Quacquarelli Symonds





# CERTIFICATE OF COMPLETION



*This certifies that*

**Mrs Nasreen Fathima**

*has successfully attended a full day workshop on  
QS Rankings & Ratings on 20 January 2020 at the  
Indian Institute of Science (IISc), Bangalore; sponsored  
by SRM Institute of Science & Technology (SRMIST)*

A handwritten signature in black ink, appearing to read 'Ben Sowter', written over a horizontal line.

**BEN SOWTER**

Senior Vice President, QS Quacquarelli Symonds





# A T M E

College of Engineering

13th Kilometer, Mysore-Bannur Road, Mysore - 570 028



## VOUCHER

No.

**1957**

Date : 30/01/2020

Name of Work : workshop at IISc, Bangalore.

Head of Account :

Name of the Party : Dr. Yathishkar L & Mrs. Nasreen Fathima

Received with thanks a sum of Rs. 500/- (Rupees Five hundred

rupees only) as advance / part / full payment towards workshop at  
IISc Bangalore.

by Cash / Cheque no.

For, **A T M E**

Nasreen Fathima  
Receiver's Signature

Authorised Signatory



Date: 25/01/2020

From,

Anil kumar B.H  
Asst. Prof, CSE

Through,

The HoD, CSE

To,

The Principal  
ATMECE

Respected Sir,

Subject: Permission to attend FDP.

with respect to the above subject, as i will be handling the "Microcontroller and Embedded systems". I would like to permit me to attend the FDP on "Microcontroller and Embedded Systems" at "JSSATE", Bengaluru, From 27th - 29th Jan - 2020. Further, I would like to request you to provide me workshop registration and TA/DA amount. kindly do the needful.

Thanking you,

Forwarded for your kind  
approval

Anil  
HOD 25/1/2020  
Dept. of Computer Science & Engg  
ATME College of Engineering  
Mysuru-570028

Ani  
25.1.2020

Bhanit.  
your faithfully

Approved  
[Signature]  
30/1/2020



**FACULTY DEVELOPMENT PROGRAMME**  
On  
**"Microcontroller & Embedded Systems"**

**Registration Form**

Name of the participant:

Designation:

Institution:

Affiliated University:

Address for Correspondence:

Email ID:

Mobile No.:

Office No.:

Details of Registration Fee:

DD No:

Date:

Bank

Amount:

Signature of the Participant

Signature & Seal of the Head

**REGISTRATION FEE DETAILS**

Registration Fee: Rs.1000/- per Participant

The DD should be drawn in the favor of

"The Principal, JSSATE" Payable at BENGALURU

**CHIEF PATRON**

His Holiness **Jagadguru Sri Sri Shivarathri Deshikendra Mahaswamiji**, Veerasimhasana Math, Suttur Srikshethra

**PATRONS**

**Dr. C. G Betsurmamath**, Executive Secretary, JSSMVP, Mysuru.

**Prof. M.H. Dhananjaya**, Advisor (T), JSSMVP, Mysuru

**Dr. Karisiddappa**, Vice Chancellor, VTU, Belgaum

**Dr. C. Ranganathaiah**, Director (A&A), JSSMVP, Mysuru

**Dr. Anand S Deshpande**, Registrar, VTU, Belgaum

**Dr. Satish Annigeri**, Registrar (Evaluation), VTU, Belgaum

**Dr. Mrityunjaya V. Latte**, Principal, JSSATE, Bengaluru.

**RESOURCE PERSON**

**Mr. Manjunath T M**, Embedded Architect, Robot Bosch, Bengaluru

**Mr. Nanda Kumar**, Head Customer Support, ALS systems, Bengaluru

**Mr. Chethan C R**, Embedded Software Engineer,  
Tekatron IT Solutions, Bengaluru

**Dr. Rekha P M**, Associate Professor, JSSATE, Bengaluru

**Mrs. Sumathi H R**, Assistant Professor, JSSATE, Bengaluru

**CONVENOR**

**Dr. Dayananda P**

Professor and Head, Department of ISE,  
JSSATE, Bengaluru. Mob: 9739003471

**PROGRAMME COORDINATOR**

**Dr. Rekha P M**

Associate Professor, Dept of ISE,  
JSSATE, Bengaluru. Mob: 9845636529

**STAFF ORGANISING COMMITTEE**

**Dr. D V Ashoka**, Professor, JSSATE, Bengaluru

**Dr. Chayadevi M L**, Associate Professor, JSSATE, Bengaluru

**Dr. Malini M Patil**, Associate Professor, JSSATE, Bengaluru

**Mrs. Sumathi H R**, Assistant Professor, JSSATE, Bengaluru

**Mrs. Mamatha G**, Assistant Professor, JSSATE, Bengaluru

**Mrs. Apsara M B**, Assistant Professor, JSSATE, Bengaluru

**Dr. Nagamani N P**, Assistant Professor, JSSATE, Bengaluru

**Dr. Nethravathi B**, Assistant Professor, JSSATE, Bengaluru

**Mrs. Anitha P**, Assistant Professor, JSSATE, Bengaluru

**Mrs. Sowmya K N**, Assistant Professor, JSSATE, Bengaluru

**Mrs. Sudha P R**, Assistant Professor, JSSATE, Bengaluru

**Mrs. Fathima Afroz**, Assistant Professor, JSSATE, Bengaluru

**Mr. Anil B C**, Assistant Professor, JSSATE, Bengaluru

**Mrs. Sahana V**, Assistant Professor, JSSATE, Bengaluru

**Mrs. Nagashree S**, Assistant Professor, JSSATE, Bengaluru

**Mrs. Punitha**, Assistant Professor, JSSATE, Bengaluru



JSS Mahavidyapeetha  
**JSS Academy of Technical Education**  
Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi  
All UG Programs are accredited by NBA for 3 years  
JSSATEB-Campus, Dr. Vishnuvardhana Road,  
Bengaluru - 560 060

**Faculty Development Programme**  
On  
**"MICROCONTROLLER  
& EMBEDDED SYSTEMS"**

(As per VTU 2018-2019 Scheme - 18CSL48)

Date: 27<sup>th</sup> - 29<sup>th</sup> January 2020



In Association with VTU, ISTE and CSI

Organized By  
Department of  
**Information Science & Engineering**  
JSS campus, Dr. Vishnuvardhana Road, Bengaluru-  
560060, Karnataka, India [www.jssateb.ac.in](http://www.jssateb.ac.in)



## INSTITUTION

JSS Academy of Technical Education, Bengaluru was established in the year 1997 under the umbrella of JSS Mahavidyapeetha, Mysuru. The Campus is located in a sprawling 21 acres of land surrounded by lush green plantation on the South-Western edge of Bengaluru City. The institute has an excellent infrastructure with the state-of-the-art equipment and machinery. The College has separate boys and girls hostel facilities. The whole Campus is networked with Wi-Fi and has centralized browsing facility. The college offers Bachelor of Engineering in E&C, CSE, ISE, E&IE, IEM, ME and Civil Engineering disciplines. The college also offers postgraduate programs in VLSI Design & Embedded Systems, Thermal Engineering & Master of Business Administration. The departments of E&C, CSE, ISE, ME, Civil, IEM & EIE are accredited by NBA for 3 years.

## DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

The Department of Information Science and Engineering started in the year 1999. The Department has current intake of 120. The Department comprises of excellent infrastructure with well equipped Laboratories, Class rooms and Departmental Library. The Student forum SAMYOG is solely for the benefit of student community. The students actively take part in the co-curricular activities like project, paper & poster presentations, coding, debugging etc. In the extra-curricular events like NSS, sports, college fest, and in the preparation of technical magazines & newsletters. They are also volunteers to their own events like YODHA, Book\_borrow.com, bookbeka.com, medical camps like blood donation camps, eye testing camps, dental camps and Ayurvedic camps etc. The students of the department have recorded very good performance in competitive examinations such as GATE, GRE, GMAT, TOEFEL, CAT, PG CET etc. and admitted in the top Universities of the world.

Department is strengthened by well qualified faculty members whose main aim is to make students aware of the cutting edge technology with competence, commitment & team work. An industry interaction is established through MOUs. Sponsored projects & industrial visits, Invited lecturers, workshops, seminars and webinars are also organized on a regular basis in emerging technologies from experts of industries and institutions.

Further, most of the faculty members and students won the best paper awards, the best poster awards, the best project awards in National / International Conferences across the globe. Our faculty members and students are also members of professional societies like ISTE, CSI & IEEE etc.

Soft-skill programmes are conducted through the placement cell for the overall personality development of the student. Most of our students are well placed in fortune 500 companies. Good number of our students have published and presented their research papers in reputed National/ International Journals and Conferences. Many of our Alumni joined MS programmes in the leading and reputed Universities across the globe. Under the R & D activity, RPS project has been taken up by the department and successfully completed.

## COURSE OBJECTIVES

- Understand the fundamentals of ARM Based Systems, Basic Hardware Components, Selection methods and attributes of Embedded System.
- Develop Software Programs using Keil Tool
- Develop Hardware Programs using ARM Board (ARM7TDMI/LPC2148)
- Comprehend the Real Time Operating System Used for the Embedded System.
- Interface External Devices and I/O with ARM microcontroller.
- Describe the architectural features and instructions of ARM microcontroller.
- Design and develop Program using various Instructions of ARM controller.

## TARGET AUDIENCE

The FDP is open for the participants from academia and industry. Number of participants will be limited to 40.

The selected participants will be informed of their selection by e-mail.

## TOPICS TO BE COVERED IN FDP

- ARM fundamentals, architecture, applications.
- RTOS used for Embedded systems.
- Experiments on ARM7TDM/LPC2148 evaluation Board using Evaluation version of Embedded 'C' & Keil Uvision-4 tool/compiler.

## VISION OF THE INSTITUTE

To be among the finest Institutions providing Engineering and Management Education empowered with Research, Innovation, and Entrepreneurship.

## VISION OF THE DEPARTMENT

To emerge as a centre of academic excellence, by producing competent professionals to meet the global challenges in the field of Information Science and Technology.

## MISSION OF THE DEPARTMENT

- M1: Prepare the competent professionals to meet the advancements in the industry and academia by imparting quality technical education
- M2: Enrich the technical ability of students to face the world with confidence, commitment and teamwork.
- M3: Enculcate and practice strong techno-ethical values.

## PROGRAM SPECIFIC OUTCOMES

- PSO1: Apply the appropriate Programming Constructs for solving Engineering problems
- PSO2: Adaptability to Software Development Methodologies.
- PSO3: Demonstrate the knowledge towards the Domain specific initiatives of Information Science & Engineering.

## ADDRESS FOR CORRESPONDENCE

**Dr. Rekha P M**

Associate Professor

Department of Information Science and Engineering, JSSATE, Dr. Vishnuvardhana Road, Bengaluru-560060 Karnataka, INDIA

Mob: 98456 36529

Email: rekhapm12@gmail.com

[www.jssateb.ac.in](http://www.jssateb.ac.in)





JSS Mahavidyapeetha

# JSS Academy of Technical Education

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JSSATEB-Campus, Dr. Vishnuvardhana Road, Bengaluru - 560 060 Website: www.jssateb.ac.in


## Faculty Development Programme on “MICROCONTROLLER & EMBEDDED SYSTEMS”

(As per VTU 2018-2019 Scheme - 18CSL48)

### CERTIFICATE


This is to certify that Dr /Mr. /Ms. Anil Kumar B.H  
of A.T.M.E.C.E

has participated in the Faculty Development Programme on “Microcontroller & Embedded Systems” from 27<sup>th</sup> to 29<sup>th</sup> January, 2020 organised by the Department of Information Science & Engineering.

  
Dr. Dayananda P  
Professor & HOD

In Association with



  
Dr. Mrityunjaya V Latte  
Principal



JSS MAHAVIDYAPEETHA  
**JSS ACADEMY OF TECHNICAL EDUCATION**

JSS Campus, Uttarahalli-Kengeri Road, Bangaluru - 560 060

Ph: 080-2861 1994, 2797, 2565

Fax: 080-2861 2706, Email: jssatebangalore@gmail.com

**RECEIPT**

R. No. **65214**

Date **27/1/2020**

Received with thanks from Smt./Sri **Anil kumar B. H.**

a sum of Rs. **1000/-**

(Rupees **One thousand only**)

on account of Deposit/✓Appln. Fee/Xerox/Breakages/Fines/Misc. **FDP Registration fees**

For JSS ATE



JSS MAHAVIDYAPEETHA

**JSS ACADEMY OF TECHNICAL EDUCATION**

JSSATE Campus, Uttarahalli - Kengeri Main Road, Bangalore - 560 060

Phone: 080-28611902, 28612797 Fax: 080-28612706 [www.jssateb.ac.in](http://www.jssateb.ac.in)

**Attendance Certificate**

This is to certify Mr./Mrs. **Anil kumar B. H.** has attended 3 days FDP from 27<sup>th</sup> to 29<sup>th</sup> on "**Microcontroller & Embedded Systems**" organized by Dept. of Information Science and Engineering, JSSATE, Bengaluru.

**Rue Pn**  
**29/1/20**  
Coordinator

**29/1/2020**  
HOD-ISE  
Head of Dept.  
Information Science & Engg.  
JSSATE, Bangalore-60.



## Expense Details

Workshop on Microcontroller and Embedded Systems

Date: From 27th-Jan-2020 to 29th -Jan-2020

Location : JSS Academy of Technical Education , Bengaluru.

sl.no	Particulars		Expense
1	Workshop Registration fee		1000/-
2	Travel Allowence	Mysore to Bangalore	125/-
3		Bangalore to Mysuru	280/-
4		Local bus fare	46/-
Total			1451/-

Received amount on 14/02/2020

JSK



Date: 13/12/2019

From,

Impana Appaji  
Assistant Professor  
Department of CSE  
ATMECE, Mysuru

To,

The Principal  
ATMECE, Mysuru

Through,

The HOD  
Department of CSE

Respected Sir,

**Sub:** Requisition to grant Registration amount for "iCASIC -2020"

This is to bring to your kind notice that the paper entitled "“VEHICULAR MONITORING USING RFID” “authored by me, has been accepted and selected for oral presentation at “The International Conference on Automation, Signal Processing, Instrumentation and Control (iCASIC 2020)”, scheduled to be conducted at Vellore Institute of Technology Vellore, Tamilnadu on 27<sup>th</sup> and 28<sup>th</sup> Feb 2020(details enclosed). Accepted papers will be published in Springer Proceedings.

Further, I request you to sanction the registration amount of Rs.5,000/-(Five Thousand Rupees Only) and permit me to attend the conference and oblige.

Thanking You,

Forwarded to principal  
for kind approval

Cloud

HOD 13/12/19  
Dept. of Computer Science & Engg  
ATME College of Engineering  
Mysuru-570028

Approved

Sub  
13/12/19

Yours Faithfully,

Impana Appaji  
Impana Appaji

Received amount Rs 5000/-

Sub  
14/2/20.





**VIT<sup>®</sup>**  
Vellore Institute of Technology  
(Deemed to be University under section 3 of UGC Act, 1956)



# International Conference on Automation, Signal Processing, Instrumentation & Control

## iCASIC 2020

27 & 28  
February  
2020

Organized by:  
**School of Electrical  
Engineering**

In association with  
**International Society of  
Automation**



📍 VIT Vellore, Tamil Nadu, India

✉ [icasic2020@vit.ac.in](mailto:icasic2020@vit.ac.in)

🌐 [www.icasic2020.in](http://www.icasic2020.in)

☎ 9486750593, 9003542499





## About iCASIC 2020

The International conference on Automation, Signal Processing, Instrumentation and Control (iCASIC 2020) intend to bring together scientists, engineers, researchers, industry leaders, and scholars in all areas of Engineering and Technology. The aim is to create a platform for open communication and idea exchange on the recent Technological and Engineering developments. This conference provides an international forum for sharing knowledge and innovation in the field of Instrumentation, Control and Automation, Electrical Electronics and Communication. This also aims to encourage intellectual development and providing opportunities for networking and collaboration. Networking enables sharpening of research skills, spark inspiration and uncover new ideas.

## About Vellore Institute of Technology

Vellore Institute of Technology (VIT) founded in 1984 as Vellore Engineering College by Dr. G. Viswanathan, the founder Chancellor of the Institute. VIT attracts students from all the states of India and more than 51 different countries because of its academic excellence.



NIRF (National Institutional Ranking Framework)  
• No. 16 in Engineering Institution - 2018  
• No. 16 in University Category - 2018  
• No. 29 in Management Institution - 2018



NAAC (National Assessment and Accreditation Council)  
• Accredited in 2015 - A Grade  
• Completed 3 cycles of Accreditation



ABET (Accreditation Board for Engineering and Technology), USA  
• 3 Times Accredited  
• 10 B. Tech Programs - Vellore Campus  
• 4 B. Tech Programs - Chennai Campus



FICCI (Federation of Indian Chambers of Commerce & Industry)  
• "Excellence in Faculty" - 2017  
• "University of the Year" - 2016



UGC Granted



QS RATING 2016  
• 4 Star Overall Rating in 2016  
• Got 5 STAR Rating for 5 Sub Categories (Teaching, Employability, Facilities, Innovation and Inclusiveness)  
• First University in India to get QS 4 Star Rating



THE RANKING  
• Ranked in the Top 251-300 in 2018. (Asia Ranking)



QS BRICS UNIVERSITY RANKING  
• 3 Times Accredited  
• 10 B. Tech Programs - Vellore Campus  
• 4 B. Tech Programs - Chennai Campus



QS IGAUGE  
• Got Diamond University Rating in 2018



ACBSP (The Accreditation Council for Business Schools and Programs), USA

VIT has introduced many innovations in academics processes which adds value to every student. FFCS (Fully Flexible Credit System), PBL (Project Based Learning) for better learning, fully digitalized academic portals that assists students in equipping themselves with, for 2020 market place, Hackathons/Makeathons as part of curriculum exercise which kindles the interest and the curiosity of students, which moulds them to be better problem solver, 8<sup>th</sup> module in every subject being handled by industry experts, making the students contextualize the concepts they study in the classroom, are a few of the innovations that VIT has introduced.

## About International Society of Automation

The International Society of Automation is a non-profit professional association that sets the standard for those who apply engineering and technology to improve the management, safety and cyber security of modern automation and control systems used across the industry and critical infrastructure. ISA was founded in 1945, it develops widely used global standards and certifies industry professionals. It provides education and training by publishing books, technical articles, hosting conferences and exhibitions and provides networking and career development programs for its 40,000 members and 400,000 customers around the world.

SA-VIT was established in the year 2010 as a multidisciplinary student section under ISA Bangalore, is one of the 5 active sections of District 14, which comprises of India, Japan, Singapore, Korea & Malaysia. The main objective of SA-VIT is to ensure technical development as well as management skills, leadership and intrapersonal development of all its members.



Having a motto of "Enlightening Minds!" we at ISA-VIT host various workshops, speaker sessions, technical industrial visits, and outreach events in various schools, and annual tech-fest SPARK, its annual flagship event - a amalgamation of technology and science, an opportunity for budding engineers to learn and apply, gain awareness of safety, and cybersecurity of modern automation tools used across industry and critical infrastructure, raise questions and get answers. It is a chance to form and strengthen friendships, professionalism, organizational and management skills. ISA - VIT consistently gets many laurels from District-14 & USA-HQ in the form of best chapter, best student member and best mentor. ISA-VIT has been recognized as the best student section under ISA Bangalore for the consecutive years & our faculty advisor Dr. Vivekanandan S was honoured as the best faculty mentor at the 55th ISA-ALA in Tampa Bay, Florida, USA.

## About School of Electrical Engineering

The School of Electrical Engineering (SELECT) has 109 faculty members who have done their UG and PG degrees from the top-notch universities. The School offers B.Tech (Electronics and Instrumentation Engineering), B.Tech (Electrical and Electronics Engineering), FIST sponsored M.Tech programme in Power and Energy and M. Tech programme in Control and Automation, M.Tech. by Research and Ph.D. in Engineering. B.Tech (Electronics and Instrumentation Engineering) and B.Tech (Electrical and Electronic Engineering), is accredited by the Engineering Accreditation Commission of ABET. All UG & PG programs of the school are accredited by the Institution of Engineering and Technology (IET), U.K.

The Placement record of the School has always been very impressive. Almost 100% of the students get job from the campus placement and many of them are getting it in core companies every year. The School has state-of-the-art laboratories in almost all the areas of Electrical, Instrumentation and Electronics Engineering. Every year, students get scholarships to do their final year projects abroad under the Semester Abroad programme (SAP).

Infanoss India, Schneider Electric, Q-Max, National Instruments and Fluke Test and Calibration have established Center of Excellence for students R&D activities under the guidance of faculty members and industry Experts. The School has signed MoUs with many foreign universities, research organizations and industries from where students get benefits for their R&D work/projects from the MoUs.

## Manuscript Submission

All manuscripts should be submitted through <https://easychair.org/conferences/?conf=icasic2020>

A submitted paper will go through plagiarism check process

Manuscript should not contain embedded links, scanned images, header and footer

Email submissions will not be accepted

50% concession for second paper by the same author

All queries related to the conference shall be addressed to [icasic2020@vit.ac.in](mailto:icasic2020@vit.ac.in)

## Important Dates

• Full Paper Submission	: 29 <sup>th</sup> October 2019
• Notification of Acceptance	: 26 <sup>th</sup> November 2019
• Camera Ready Paper Submission	: 17 <sup>th</sup> December 2019
• Conference Dates	: 27 <sup>th</sup> & 28 <sup>th</sup> February 2020



## Original Contributions

are solicited on topics covered on broad areas not restricted to

### Instrumentation

- Analytical & Virtual Instrumentation
- MEMS & Nano Sensors
- Bio & Chemical Sensors
- Sensors Fusion
- Tomography & Imaging Techniques
- IOT based Instrumentation
- Nano Photonic & Optical Sensors
- Machine Learning & Wireless Sensors

### Control & Automation

- Fuzzy & Neural based Control System
- Robotics & Automation
- Fault Detection & Diagnosis
- Hybrid System & Modelling Design
- System Identification and Selection
- Distributive, Cooperative & Network Control System

### Electronics & Communication

- Signal & Image Processing
- Nano Technology
- Semiconductor Devices & VLSI
- Parallel & Distributed Computing Statistic Learning & Pattern Recognition
- Wireless Communication
- Computer Networks and Security
- Embedded Systems
- Cognitive System Research

### Electrical

- Smart Grid
- Soft Computing Technology
- Green and Renewable Energy Techniques
- Electrical Power System
- E-Vehicle Technology
- Electrical Drives
- Power Converters & Inverters
- Energy Management System



Selected Papers published  
in Scopus Indexed Journals



Top Notch Papers published  
in ISA Transactions



All Papers published  
in Springer proceedings

## Registration Details

CATEGORY	Registration Fees	
	ISA Members	Non - ISA Members
Faculty/Industry Professionals	Rs. 6,000	Rs. 7,000
Research Scholars, UG & PG Students	Rs. 4,000	Rs. 5,000
Foreign Delegates	100 USD	150 USD



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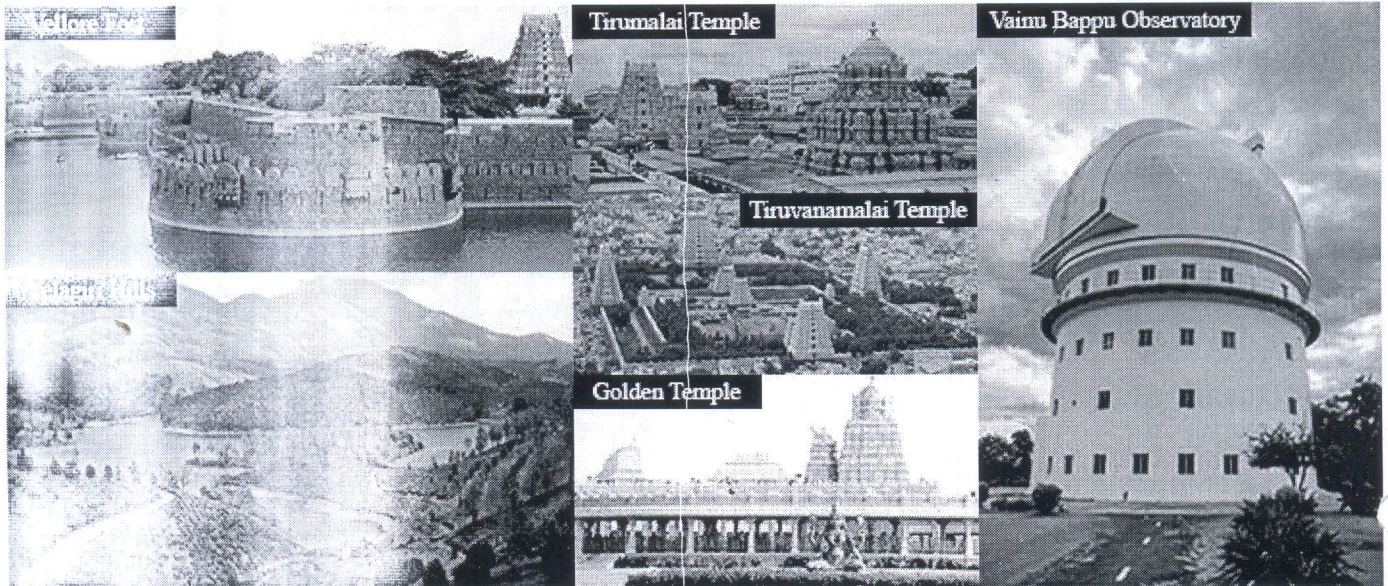
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- Dr. E. R. Rajkumar, Robert Bosch, Bengaluru, Karnataka, India.



## Places to visit near Vellore



Vellore is popular and one of the oldest cities of South India. It is the administrative headquarters of Vellore District in Tamil Nadu situated on the banks of Palar River. Vellore is popularly known as the Fort City of Tamil Nadu. The name Vellore also means a City of Spears. Vellore has an enriching legacy reflecting the early Dravidian Culture. It has been ruled by the Pallavs, Cholas, Vijaynagara Empire, Rashtrakutas, Carnatic Kingdom and the British.

Vellore has many historic and religious attractions. The famous Sripuram Sri Lakshmi Golden Temple is situated near Vellore. The Vellore Fort is a prime attraction in the town completely made of granite stone. The Fort might have been built during the rule of Chinna Bomma Nayak (1526 AD to 1593 AD). The Fort is one of the most perfect specimens of Military Architecture in South India. The other important attractions of Vellore includes the Clock Tower, the State Government Museum, the French Bungalow, Science Park, Jainu Bappu Observatory, Amrithi Zoological Park, Big Mosque, St. Johns Church, Delhi Gate and the Pearl Palace.

**Dr. S. Sivabalan**

Organizing Chair

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Conference Chair

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**iCASIC 2020 notification for paper ID 68**

**Inbox**

**iCASIC 2020** <[icasic2020@easychair.org](mailto:icasic2020@easychair.org)>

Mon, Nov 25, 3:18 PM  
(10 days ago)

to me

**Dear author,**

**Greetings from Vellore Institute of Technology!**

On behalf of the Technical Program Committee of "The International Conference on Automation, Signal Processing, Instrumentation and Control (iCASIC 2020)", we thank you for uploading your research paper and since, your paper is accepted you are advised to proceed with the registration and payment process.

Registration Link: <http://info.vit.ac.in/Events-VIT/iCASIC-2020/apply.asp>

Kindly consign the website for more details <http://icasic2020.in/>

**General guidelines for conference**

- For availing certificates for additional authors (except registered author), an additional amount of Rs.1000 has to be paid for each author on the day of conference. (spot registration)
- Based on the willingness of the author, after the payment and registration process, the paper will be published either in Scopus & Springer indexed proceeding (Lecture notes in Electrical Engineering) or Anna university Annexure I indexed journals. ( By paying additional amount)

**Guidelines for registration and payment**

- Kindly make sure that you know your accepted paper ID and registered email ID used in easy chair account.
- Select the participant type carefully. You should have valid proofs if you are selecting ISA (International Society of Automation) membership category. Proof of the same should be produced on the day of conference.
- Please provide a valid mobile number.
- After filling the registration page, a reference number will be generated and mailed to your registered mail ID.
- Then fill the 'Make the Payment' page, provide the reference number mailed to you in this page and complete the payment process.
- After completing the payment, mail the acknowledgement to [icasic2020@vit.ac.in](mailto:icasic2020@vit.ac.in).

Thanks & Regards

Dr. S. Balamurugan (Mail id: [sbalamurugan@vit.ac.in](mailto:sbalamurugan@vit.ac.in))

Organizing Co-chair, i-CASIC2020

School of Electrical Engineering

Vellore Institute of Technology

Vellore, Tamilnadu, India- 632 014





**Registration Acknowledgement - Receipt**

Date of the Conference	27 <sup>th</sup> & 28 <sup>th</sup> February 2020
Reference No.	ICAS085630
Name	IMPANA APPAJI
Mobile No.	8762578865
Email address	impana.appaji@gmail.com
Fee	5000
Payment done through	Netbanking / Credit Card / Debit Card
Transaction No.	968033733
Bank Ref.No.	ICAS085630
Payment Date	11-12-2019 09:55:23
<b><u>Important Instruction</u></b>	
<ul style="list-style-type: none"><li>• Please bring this acknowledgment receipt for the conference.</li><li>• In Addition to the above total amount bank charges will be debited.</li></ul>	



Date: 30.07.2019

From,  
Mr. Thejkumar J  
Assistant Professor,  
Department of Mechanical Engineering,  
ATME College of Engineering, Mysuru-28

To,  
The Principal,  
ATME College of Engineering,  
Mysuru-570023

Through,  
The Head of the Department,  
Department of Mechanical Engineering, ATMECE

Respected Sir,

**Subject: Request for Reimbursement of Travelling Expenditure towards 7 Days FDP**

As per your instructions, I have attended AICTE Sponsored 7 Day Faculty Development program for Student Induction Program (SIP) at Sri Venkateshwara College of Engineering, Bengaluru from 23-29 July 2019.

I here by submitting the travelling expenditure details, the travelling expenditure amounts to rupees 625/-. I request you to kindly reimburse the same and oblige.

Thanking You,


Yours Faithfully,

  
THEJKUMAR J

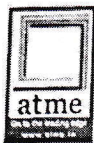
*Forwarded to the principal for  
Kind approval.*

*A Rattas  
30/7/19*

*Approved to pay ₹ 625/- from dept fund*

*  
30/7/19*





A T M E

College of Engineering

13th Kilometer, Mysore-Bannur Road, Mysore - 570 028



No. 1611

VOUCHER

Date : 30/7/19

Name of Work : 7 Days FDP ON (SIP) Student Induction Programme

Head of Account :


Name of the Party : Mr. Theekumar J

Received with thanks a sum of Rs. 625/- (Rupees Six hundred and twenty five only) as advance / part / full payment towards Attended AICTE

Sponsored 7 day Faculty Development Programme Student Induction Program at Venkateshwara college of Engg - Bangalore from 23/7/19 to 29/7/19

by Cash / Cheque no. 200030

For, A T M E

  
Receiver's Signature

Authorised Signatory



**Report on “Faculty Development Program for Student Induction (FDP-SI)” during 23-29 July 2019 at Shri Venkateshwara College of Engineering, Bangalore organized by All India Council for Technical Education (AICTE).**

### **Brief History about inception of UHV**

As per the discussion held on 49th meeting of Council held on 14th March 2017, Three Weeks Induction Program is made mandatory. Accordingly, a three-week mandatory induction program for students has been designed. Induction Program is to be offered right at the commencement of the first year and classes will begin only after student Induction program is over. Main Purpose behind this initiative is to make the students feel comfortable in their new environment, set a healthy daily routine, create bonding in the batch as well as between faculty and students. The student induction program is now a part of the model curriculum of Undergraduate Studies in Engineering & Technology launched by Hon’ble Minister of HRD during a conference on ‘Quality Initiatives in Technical Education’ on 24th January 2018 at AICTE, New Delhi. It has already been requested to all universities/institutions to adopt the model curriculum from the academic session 2018-19.

### **Why FDP-SI**

Education is for developing the students’ full human personality, so that they are able to participate meaningfully not only in their profession, but also in their family, society and their natural environment – ultimately leading to a society that is just and equitable. Every commission on education has articulated the need for human values in education.

In this regard AICTE is articulated to conduct three weeks of Induction Program to students who are Newly joined to the technical Education Institutes.

It is of utmost importance that the faculty members/teachers are well equipped and prepared to conduct the SIP. The core of SIP is Universal Human Values module. It must be delivered by the faculty members from the respective branch/discipline of the student group. Appropriate FDPs have been designed and are being organized for preparing faculty members.

The following Faculty development Programs (FDPs) are being conducted throughout the country for this with the support from AICTE HQ and Regional Offices:

- 3-day FDP-SI (UHV) or 5-day online UHV FDP – Orientation to UHV for SIP
- 7-day UHV FDP – Details of UHV, essential for qualifying to teach UHV-I or UHV-II

**In this regard A 7-day FDP-SI is organized at Shri Venkateshwara College of Engineering, Bangalore organized by All India Council for Technical Education (AICTE) from 23-29 July 2019.**

The Program is coordinated and conducted by the resource person Sri. Ashok Gopala Sir. Sir is eminent scholar and engineer by profession. Sir is practicing UHV by Jeevan vidya from many years and was a renowned speaker and conducted many workshops on Jeevan vidya based UHV.





A T M E

College of Engineering



Department of Mechanical Engineering

In day 1, Sir has recalled the learnings from the three days' workshop on UHV. Many of the participants were shared their experience on the Universal Human values and render their doubts to the resource person.

The key issues discussed on Day1 are:

There Issues which need to be addressed or resolved in teaching process.

1. Bring in ethical/moral/ human values on once life.
2. Creating Sustainable engineering human resources
3. Engineering, environment and Economics

In Day2, Aspects of human living with respect to Work, Behaviour, Intellectual and spiritual is discussed. Also detail discussion is carried out on work and collaboration.


In Day 3, Seven types of Human relationships were discussed. Also, Harmony in Relationship is discussed in the morning Session. In the afternoon Session behavioural values such as Gratitude, Admirations, reverence, Love and trust were discussed.

In Day 4, the session is started with topic on Evaluation. Later the discussion is turned on to the Human needs by discriminating the needs in terms of Self and Body. It was concluded the bodily needs are finite and self needs are infinite. Also, the bodily needs are tangible and self needs are intangible. Hence, the essence of human living lies in living in harmony and to be happy.

In Day 5, the discussion started with Co-Existence. Co-existence of the Self and Body. And also, coexistence of the human with nature. The four orders the universal existence is discussed and their mutual existence is also been discussed in detail. The material order (Planet & resources), Plant order, animal order and knowledge order (human living) and their inter relationships were described in the session.

In day 6, Human conduct based upon the humanness is discussed. Human conduct in the areas of relationships, Social sphere and collaboration is discussed on the basis of responsible human conduct and in the absence of human conduct were discussed in the session.

In day 7, the resource person allowed the participants to choose on their topics from the SIP manual and the participants were presented their topics. Also, the day is kept open for the comments and doubts regarding the UHV and the process of implementation in the college. The program is concluded with the valedictory thanking the resource person Sri Ashok Gopala Sir and all participants were given the feedback on the 7day FDP-SI.

  
(THEJICMAR.J)





A T M E  
College of Engineering

Department of Mechanical Engineering



*Inauguration of 7 Day FDP-SI at Shri Venkateshwara College of Engineering, Bangalore*



*Participants from ATME: Prof. Thejkumar J, Sri. Ashok Gopala (resource person), Prof. Priyamka B, Prof. Bharathi*



From,

Date : 16/03/2020

Jyothi.DN.

Asst Prof.

Civil Dept ATMECE

To,

The Principal

ATMECE

Myrur

Approved

 16/3/2020

Through

HOD

Civil Dept


ATMECE, Myrur

Subject : Requesting to Sanction Rs. 4500 towards  
Scopus Indexed paper.

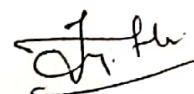
Respected sir,

With respect to the above subject, I have applied my technical paper in the 2nd International Conference on 'Emerging Research in Civil, Aeronautical & Mechanical Engineering' on 25<sup>th</sup> & 26<sup>th</sup> July 2019 at Nitte Meenakshi Institute of Technology, Bangalore. This paper was published in Scopus Indexed on 10<sup>th</sup> January -2020 [AIP], which was costed me of Rs 4500. In this regard I request you to sanctioned the amount [4500Rs] from the civil department. I kindly request you to do the needful & oblige

Thanking you

Forwarded to principal sir for  
consideration.  


Yours faithfully,

 Jyothi DN





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**ERCAM - 2019**

**CERTIFICATE**

This is to Certify that Dr. / Mr. / Ms. *Jyothi Devanur* ..... has presented  
a research paper titled *A study on Index Properties of Kaolinite & Bentonite Sand*.....  
*Mixtures*..... at 2<sup>nd</sup> International conference on 'Emerging

Research in Civil, Aeronautical & Mechanical Engineering' held on 25<sup>th</sup> & 26<sup>th</sup> July, 2019 at Nitte Meenakshi Institute of  
Technology, Bengaluru, India, published in conference proceedings by Springer and AIP



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# A study on index properties of kaolinite and bentonite sand mixtures

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# A study on Index properties of Kaolinite and Bentonite Sand Mixtures

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**Abstract :** Index properties aid in identification classification, and assessment of behavior of fine grained soils. Index properties also have an influence on the shear strength, compaction, swelling, bearing capacity and shrinkage characteristics of the fine grained soil.

This paper deals with the assessment of index properties of artificially prepared fine grained soil mixtures (Kaolinite-Sand Mixtures and Bentonite-Sand Mixtures of varying proportions). An attempt to correlate the index properties with natural soil has been made in this study. The studies showed that Atterberg limits of the soil under study can be correlated (with respective clay size) linearly with fair degree of accuracy. These correlations are helpful in predicting the index properties of soils.

**Key words:** Grain size distribution, Liquid limit, Plastic Limit, shrinkage Limit.

## INTRODUCTION

The behaviour of fine grained soil is different because of its physico-chemical in nature influenced by the soil clay mineralogy. The natural soils contain two extreme clay minerals namely kaolinite and montmorillonite in different proportions, in addition to other clay -minerals and non-clay minerals. These clay minerals are responsible for the engineering behavior, especially for the physio-chemical behavior of natural fine-grained soils. The relative proportion of these clay minerals in any natural soil decides the relative activeness of the soil. It is a well-known fact that the physical properties of the soil are being greatly influenced by clay mineralogical composition. Ex: In Kaolin dominant soil the dominance of attractive forces lead to flocculent structure in the soil, whereas in montmorillonite soil due to the dominance of repulsive forces dispersive structure of the soil is seen. However in Kaolinite-Montmorillonite soils, the attractive and repulsive forces may get neutralized depending upon the dominance of the clay mineral present in the soil mix. The contradictory behavior of kaolinite and montmorillonite soils present in different proportions greatly influence the engineering behavior of soils.

The studies of index behavior of such soils are being restricted to the demographical locations. To have thorough understanding of general trend of variation in index properties of fine-grained field soils having clay mineralogical composition around the world requires lot of time and financial implications. In order to overcome this issue, in the present experiment study the index properties and behavior of kaolinite sand, bentonite sand mixtures are studied

From documented literature it is evident that the studies related fine-grained soil is region specific, hence it is difficult to summarize the behavior study of fine-grained soil in general. The experimental data analysis of artificially prepared soils representing the natural fine grained soils having extreme clay mineralogical composition is a value addition to the existing literature and is useful in predicting data for natural fine grained soils having kaolinite and montmorillonite clay dominance.



## **LITERATURE REVIEW**

Dumbleton and West (1966) studied composition of clay minerals on their detailed experiment work conducted on natural kaolinite, montmorillonite soils and commercially available mixtures of different proportions and also established correlation between clay content, liquid and plastic limit of the mix proportions.

Prakash et al., (2012) have been shown that specific gravity of soil solids is computed by some of the measurements taken during in shrinkage limit test and result of specific gravity of solids obtained by this method is fairly accurate and close to specific gravity determined by density bottle or pycnometer method.

Polidori (2007) made investigation in their experimental work carried out on inorganic soils mixed with fine silica sand in different proportions and establish the relation between clay content, liquid limit and plastic limit and can be effectively correlated.

Sivapullaiah and Sridharan (1985) made detailed experimental work on liquid limit of soil mixtures containing bentonite, kaolinite, sand and silt of different gradation and sizes have shown that the liquid limit of artificial mix proportions are not governed by linear law of mixtures. They also observed that particle shape of the sand does not have any significant influence on liquid limit and they also conducted that liquid limit of the artificial mix proportions obtained by the cone method is lesser than the limit obtained by using the Casagrande apparatus.

Sridharan and Prakash (1998b) have shown that shrinkage process is a packing phenomenon and it does not depend on plasticity characteristics of soil.

Yong, Boonsinsuk, and Wong .G (1986) showed that the backfill material is sometimes designed as soil mixtures, which require low shrinkage property along with other stringent requirements so the shrinkage properties are assuming having greater importance as the soil is being used as backfill material in many instances.

Zhang and Frederick (2016) attempted to study about index and compaction properties of the clay minerals by considering commercially available powdered montmorillonite, kaolinite and quartz in 30%, 50%, 70% and 100% and also established a good correlation between index and compaction properties of the soil.

The studies related to index properties of kaolinite and bentonite having varying proportions of fine sand mixtures representing natural fine grained is very scanty.

## **METHODOLOGY**

Materials used for the experimental study are as follows

1. River sand passing 425 micron
2. Kaolinite Clay Mineral
3. Bentonite Clay Mineral

Commercially available clay mineral kaolinite and bentonite, clay mineral obtained from different sources are stored in air tight plastic containers. Natural river sand were procured and subjected to wet washing and then oven dried, mixed with clay proportions (clay proportions varied from 10% to 90% kaolinite in kaolinite - sand mixtures and 10% to 90% bentonite in bentonite - sand mixtures) and stored in air tight plastic bins before subjecting to index properties tests.



## LABORATORY TESTS

Following laboratory tests were conducted for the prepared samples

- Specific gravity (IS: 2720-Part 3-1980) (ASTM D854 - 14) -to determine the value of specific gravity (G)
- Grain Size Distribution (Sieve Analysis) (IS: 2720-Part-4-1985) (ASTM D6913 / D6913M – 17)
- Atterberg limits (IS: 2720-Part-5-1985) (ASTM D4318 - 17e1) -to determine the liquid limit (Casagrande Method), plastic limit and shrinkage limit of the kaolinite-sand and bentonite –sand mixtures.

To determine plastic limit of soil take approximately 15 g of soil sample and its mixed with sufficient quantity of water .A portion of soil ball is rolled on a glass plate into a thread of uniform diameter through its length and continued till it starts to crumble at a diameter of 3mm , then the crumble portion was kept in oven and maintaining the temperature of 110°C for 24 hour to determine water content . The average of three values is taken as plastic limit of that soil

To determine shrinkage limit, the soil was mixed with water to bring the soil to a consistency that it can flow .The soil mixture was placed in the shrinkage dish. The wet soil pats were allowed to air dry till the color turns from dark to light and were then dried at a temperature of 110°C for 24h.

## RESULTS AND DISCUSSIONS

Based on the test methods prescribed in the above mentioned codes, the tests were performed on the soil mixtures and the following experiment results were obtained.

The grain size distribution follows uniformly graded curve in case of Kaolin- sand and Bentonite - Sand mixtures. The curves show convexity and concavity based on the percent kaolinite and bentonite content in the mix proportions.

Figures 1 and 2 shows the grain size distribution curve for kaolinite-sand and bentonite-sand mixtures.

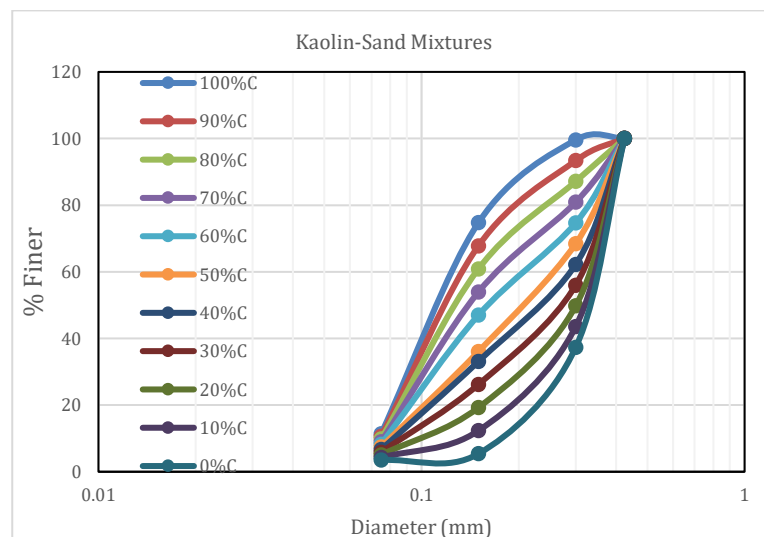
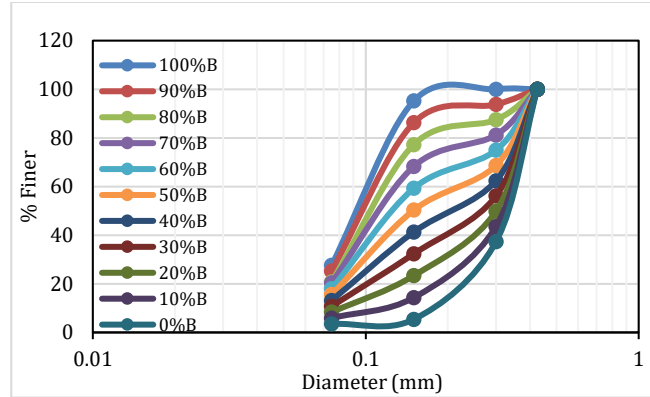


FIGURE 1: GSD of Kaolin-Sand Mixtures





**FIGURE 2:** GSD of Bentonite -Sand Mixtures

In order to understand the variation of specific gravity with percent kaolinite and bentonite in the design mix proportion, the weighted average value of specific gravity of the mix proportions is obtained. This is carried out by determining the average value of specific gravity for all the combinations and then a value of  $G/G_{avg}$  is multiplied to the actual specific gravity in order to obtain the corrected value of specific gravity for individual test. The same procedure has been followed for tests involving bentonite sand mixtures also.

Table 1 and Table 2 show the index properties tested for the Kaolin-Sand and Bentonite –Sand Mixtures.

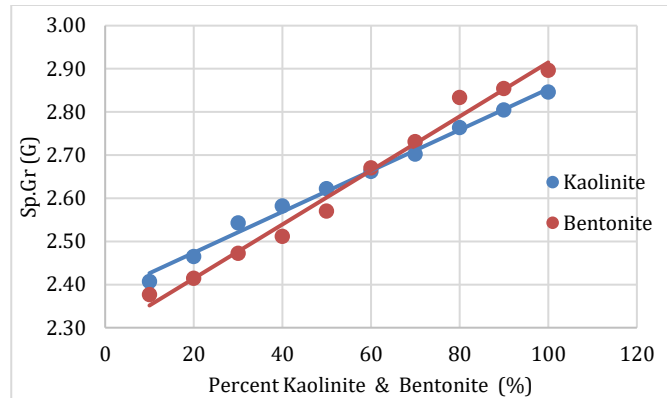
**TABLE 1:** Index properties of Kaolinite - sand mixtures

Sl no	K (%)	Gavg	W <sub>L</sub> (%)	P <sub>L</sub> (%)	W <sub>s</sub> (%)	I <sub>p</sub> (%)	I <sub>s</sub> (%)
1	10	2.41	NP				
2	20	2.46	NP				
3	30	2.54	36.33	18.65	21.80	17.67	14.53
4	40	2.58	38.09	19.29	22.26	18.80	15.83
5	50	2.62	42.87	22.23	21.93	20.64	20.94
6	60	2.66	50.73	24.61	22.00	26.12	28.73
7	70	2.70	53.64	25.30	21.46	28.34	32.19
8	80	2.76	58.34	26.92	21.49	31.42	36.85
9	90	2.80	64.96	28.87	20.72	36.09	44.23
10	100	2.85	67.51	30.12	18.70	37.39	48.82

**TABLE 2:** Index properties of Bentonite - sand mixtures

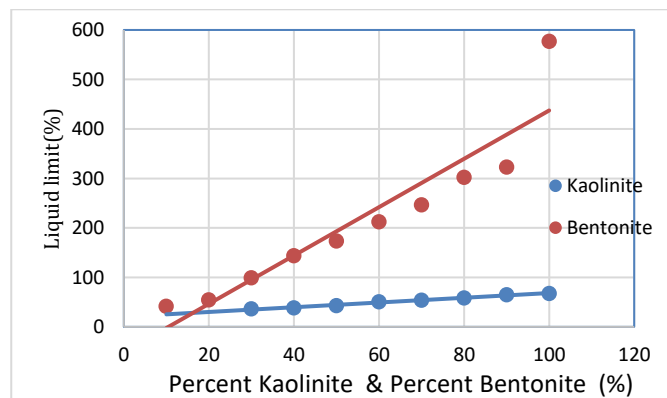
Sl no	B (%)	Gavg	W <sub>L</sub> (%)	P <sub>L</sub> (%)	W <sub>s</sub> (%)	I <sub>p</sub> (%)	I <sub>s</sub> (%)
1	10	2.38	41.83	NP			
2	20	2.41	54.42	NP			
3	30	2.47	98.90	27.15	21.33	71.75	77.57
4	40	2.51	144.1	29.32	20.72	114.82	123.42
5	50	2.57	173.5	32.23	19.87	141.27	153.63
6	60	2.67	212.6	35.27	18.34	177.34	194.27
7	70	2.73	246.6	38.21	17.43	208.39	229.18
8	80	2.83	302.0	41.52	16.61	260.54	285.46
9	90	2.85	322.9	43.76	13.75	279.21	309.21
10	100	2.90	577.1	48.59	12.59	528.60	564.59

Figures 3 through FIGURE 8 show the variation of Kaolinite - Sand & Bentonite - Sand content with the index properties of the soil such as Specific gravity, Liquid limit, Plastic limit, Shrinkage limit, Plasticity index and Shrinkage Index respectively.

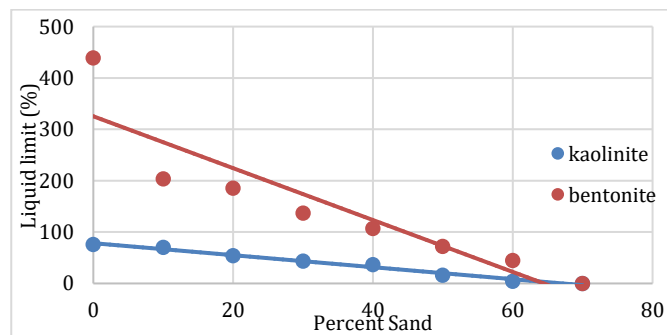


**FIGURE 3:** Variation of Specific gravity with Kaolinite & Bentonite (%)

In FIGURE 3 a trend of increase in specific gravity from 2.41 for 10%K+90%S (Sand with least dense) to 2.85 for pure kaolinite (maximum fines content) and 2.38 for 10%B+90%S (Sand with least dense) to 2.90 for pure bentonite (maximum fines content) was observed. This trend can be attributed to the fact that the increase in the fines content of the mixture reduces the voids in the mixture. Experimental results show that specific gravity of mix proportions can be effectively correlated with percent kaolinite-sand and bentonite –sand mixtures.



**FIGURE 4:** Variation of Liquid limit with Kaolinite & Bentonite



**FIGURE 5:** variation of Liquid limit with percent sand



From FIGURE 4 and FIGURE 5, it can be observed that as the percent kaolinite and bentonite in mix proportion increases, liquid and plastic limit of the mix also increases. This is due to higher specific surface available for activities of fine clay mineral which increases the values of liquid and plastic limit. It is also observed that liquid and plastic limit of the bentonite –sand mixtures is higher than kaolinite-sand mixture which is due to the presence of bentonite which is having a higher degree of activeness in addition and surface area of bentonite is more than the kaolinite clay mineral.

Sridharan et.al(1988) it is observed that there exists only a low dependence between  $W_L$  value and the content of clay fraction of soils, their specific surface and cation exchange capacity.

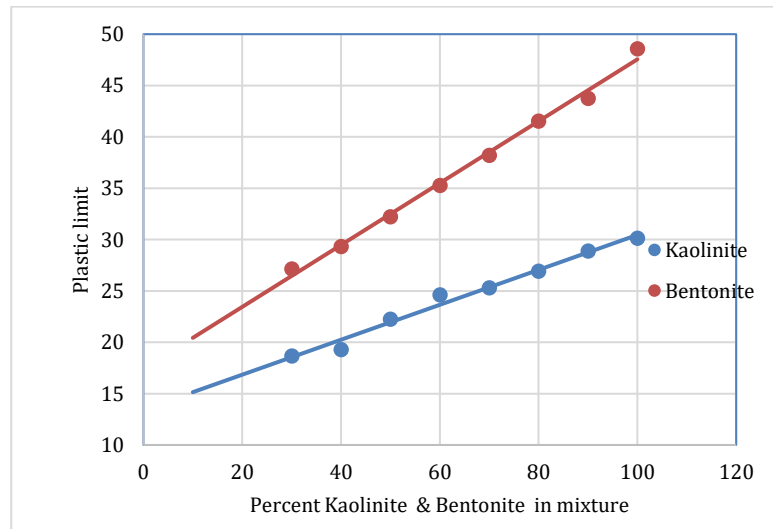
It can also be seen that from table 3 and 4 liquid limit of kaolinite -sand mixtures varies from 36.33% for 30K+70S to 64.96% for 90K+10S (increase in magnitude of 1.78 fold) whereas liquid limit of bentonite – sand mixtures varies from 41.83% for 30B+70S to 322.90% for 90B+10S (increase in magnitude of 7.79 fold)

Percentage increase in the liquid limit values for bentonite-sand mixtures is very high in relative comparison to kaolinite-sand mixtures. This trend highlights the governing mechanisms.

Controlling the liquid limit of fine grained natural soil that is clay mineralogy and pore medium chemistry. It also mentioned in the documented geotechnical literature that kaolinite and montmorillonite exhibits opposite trend of behavior due to the effect of A- forces leading to flocculent structure and R-forces leading to repulsive structure in kaolinite and montmorillonite soils respectively.

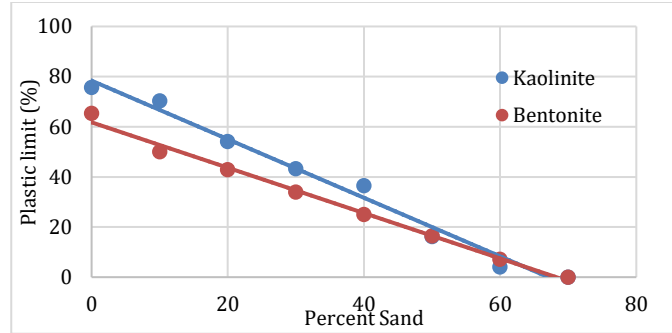
From FIGURE 5 it is evident that as percent sand increases in kaolinite-sand and bentonite-sand mixtures, liquid limit of the mix proportions decreases and obtain a minimal value at around 70%.

Further percent kaolinite and bentonite in the mix proportions can be correlated very well with liquid limit and plastic limit which is shown in table-5.



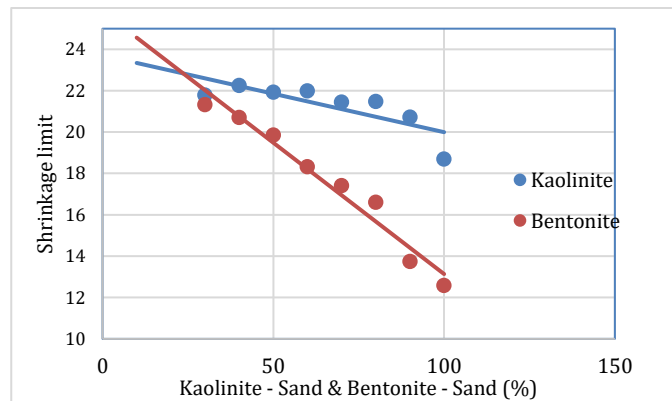
**FIGURE 6:** Variation of Plastic limit with percent Kaolinite & percent Bentonite

From FIGURE 6 it can be observed that as percent kaolinite and bentonite in the mix proportion increases, plastic limit of the mix proportion also increases. This trend is more pre-dominant in case of bentonite-sand mixtures (27.15% to 48.59% ie 1.79 fold) in relative comparison to kaolinite-sand mixtures (18.65% to 30.12% ie 1.62 fold)



**FIGURE 7:** Variation in Plastic limit with Kaolinite & Bentonite

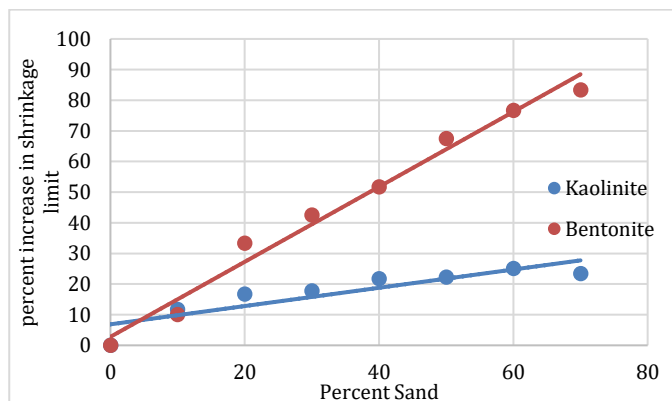
Figure 7 justifies that, as percent sand in the mix proportion increases, plastic limit of the soil decreases which is due to inert sand particles not exhibiting the plasticity characteristics.



**FIGURE 8:** Variation of shrinkage limit with Kaolinite & Bentonite-sand mixtures.

From FIGURE 8 it can be observed that as the percentage fines that is kaolinite or bentonite increases, shrinkage limit decreases. This observation clearly shows that shrinkage limit is a packing phenomenon reported by Shridharan and Prakash (1998) and shrinkage limit of natural soil is primarily a function of relative grain size distribution of the soil and irrespective of the principal clay mineral present in the soil matrix.

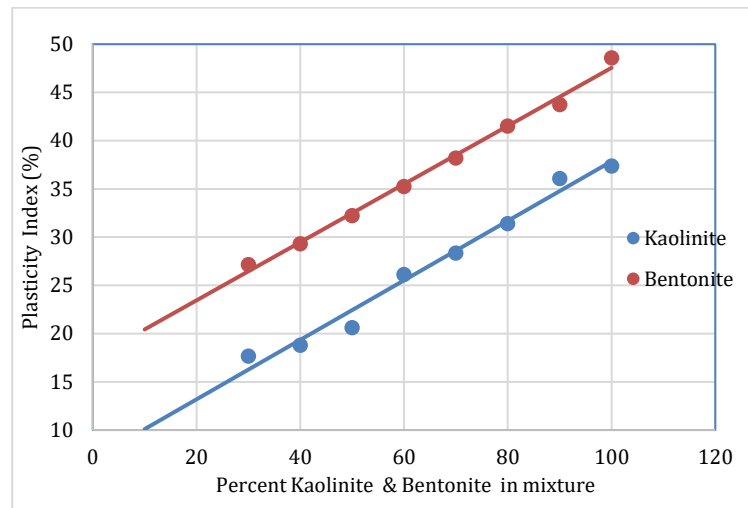
Further percent kaolinite and percent bentonite can be correlated very well with shrinkage limit which is given in Table 5.



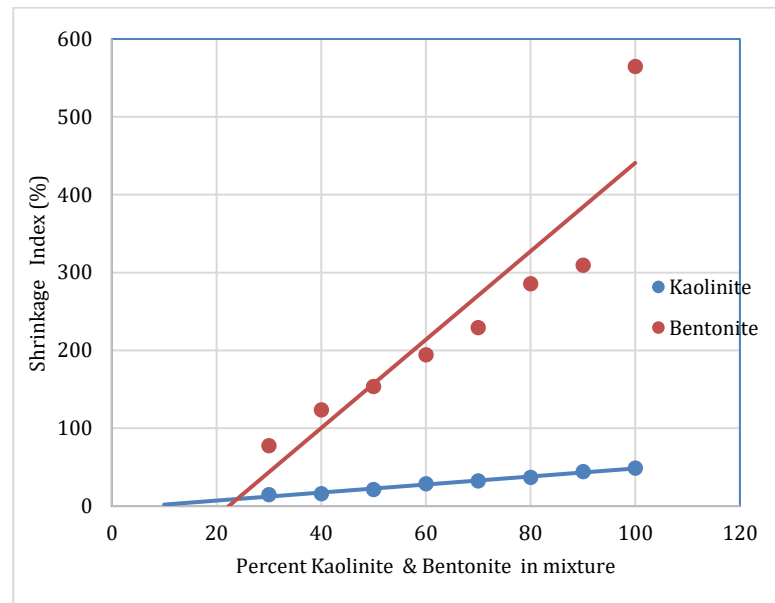
**FIGURE 9:** variation in Shrinkage limit with percent sand



FIGURE -9 also shows that percentage increase in shrinkage limit increases with increase in percent sand in kaolinite-sand and bentonite-sand mixtures which evidently shows that , shrinkage limit is primarily depends upon grain size distribution rather than plasticity character as reported in the literature .



**FIGURE 10:** Variation of Plasticity index with Kaolinite - Sand & Bentonite - Sand (%)



**FIGURE 11:** Variation of Shrinkage index with Kaolinite - Sand & Bentonite - Sand (%)

From figures 10 and 11 it can be observed that as the percent kaolinite increases plasticity index of the mix also increases from 17.6 to 37.69 percent it is also observed that as percent bentonite increases, plasticity index of the mix also increases from 71.75 to 528.6 which agree well with the trend of variation of liquid and plastic limit of the mix .Further plasticity index of the mix can be correlated with percent kaolinite and percent bentonite which is given by Table 3.

Table 3 gives the relation between Kaolinite - Sand & Bentonite - Sand content with the index properties of the soil. It is observed that there is an effective correlation which occurs in K-S and B-S mixtures

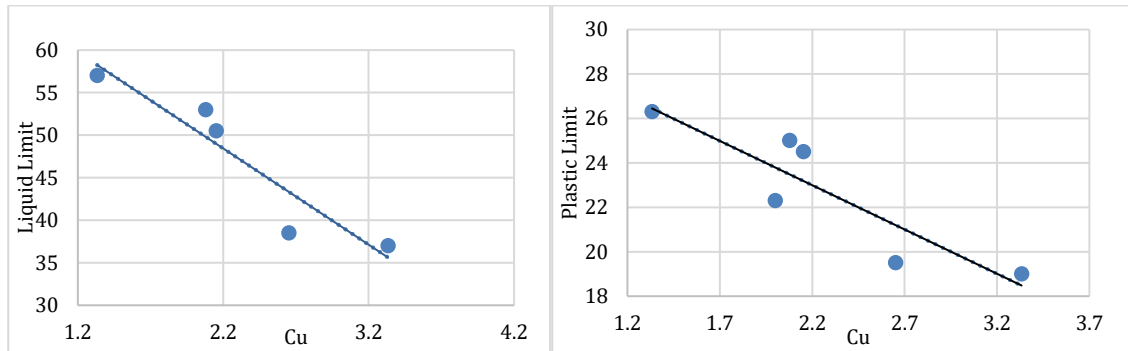
**Table 3:** Relation between Kaolinite - Sand & Bentonite - Sand content with the index properties of the soil.

Fig no	Kaolinite–Sand Mixtures		Bentonite–Sand Mixtures	
	Relation	R Value	Relation	R Value
3	$G = 0.0047*A + 2.3788$	0.996	$G = 0.0063*B + 2.2889$	0.992
4	$W_L = 0.4785*A + 20.455$	0.993	$W_L = 4.8851*B - 51.259$	0.930
5	$WL = -1.168x + 78.378$	0.99	$WL = -5.049x + 325.37$	0.91
6	$W_p = 0.1701*A + 13.442$	0.991	$W_p = 0.3013*B + 17.419$	0.996
7	$WP = -1.168x + 78.378$	0.99	$WP = -0.9048x + 61.756$	0.996
8	$W_s = 0.0372*A + 23.713$	0.793	$W_s = -0.127*B + 25.835$	0.982
9	$W_s = 0.2982x + 6.855$	0.89	$W_s = 1.2242x + 2.7778$	0.99
10	$I_p = 0.3084*A + 7.0122$	0.990	$I_p = 0.3013*B + 17.419$	0.996
11	$I_s = 0.5157*A - 3.2583$	0.993	$I_s = 5.6769*B - 126.83$	0.914

\*A = Kaolinite - Sand (%)

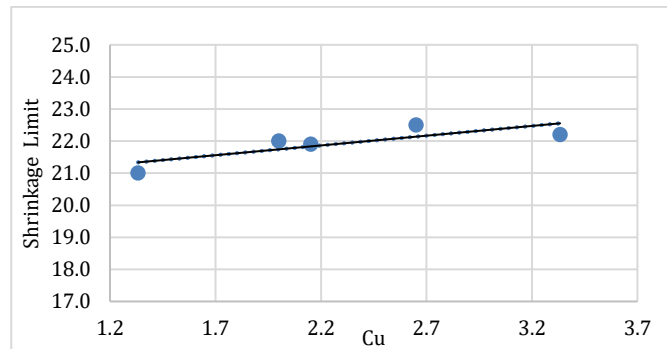
\*B = Bentonite – Sand (%)

FIGURE.12 through FIGURE.23 shows the variation of Index properties with uniformity index and Coefficient of curvature of the soil mixtures.



**FIGURE 12:** Variation of Liquid limit of kaolinite-sand with  $C_u$  **FIGURE 13:** Variation of Plastic limit of kaolinite-sand with  $C_u$

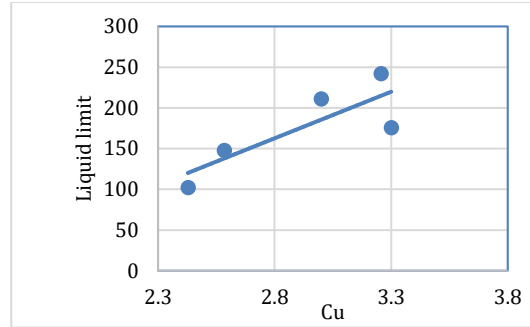
Figures 12 and 13 shows that as the coefficient uniformity of the mix proportions increases liquid limit and plastic limit decreases considerably for kaolinite-sand mixtures. This behaviour be attributed to the fact that, as the percent kaolinite in the mix proportion increases because of the flocculent fabric effect (A-forces dominance) .



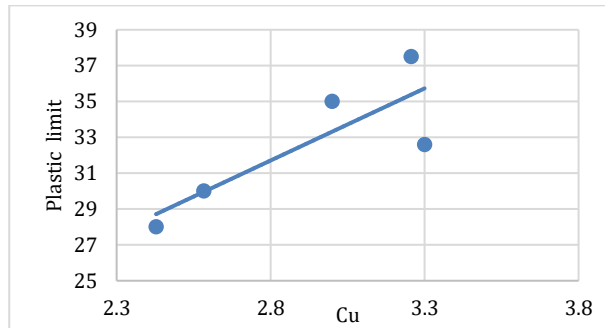
**FIGURE 14:** Variation of Shrinkage limit of kaolinite-sand with  $C_u$

From figure 14 it is observed that as  $C_u$  increases shrinkage limit of the kaolinite-sand increases because of the inter particle re-arrangement.

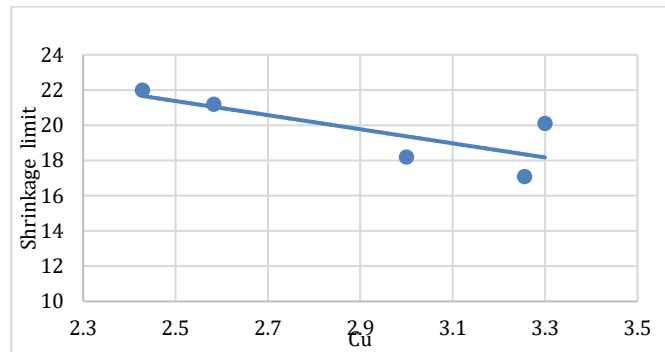




**FIGURE 15:** Variation of Liquid limit of bentonite-sand with Cu

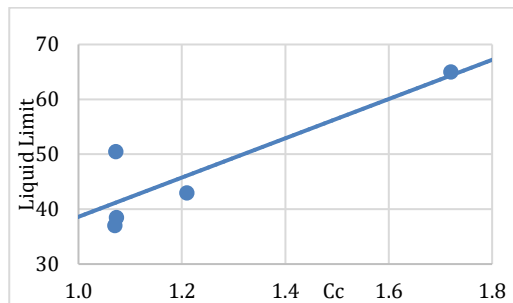


**FIGURE 16:** Variation of Plastic limit of bentonite-sand with Cu

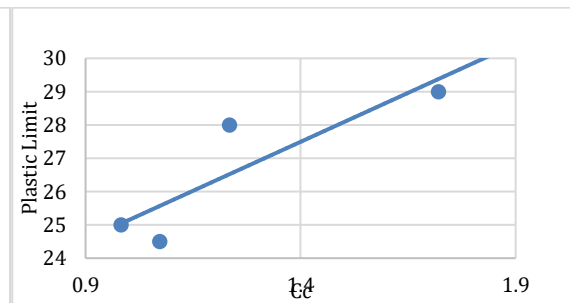


**FIGURE 17:** Variation of Shrinkage limit of bentonite-sand with Cu

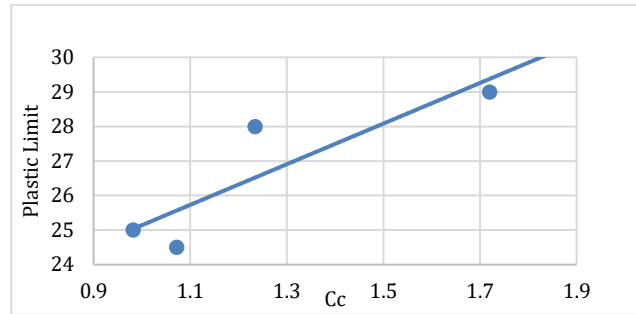
A opposite trend of behaviour is seen for bentonite-sand mixtures for liquid limit (FIGURE 15) plastic limit (FIGURE 16) and shrinkage limit (FIGURE 17) as far as uniformity coefficient of the mix proportion is considered.



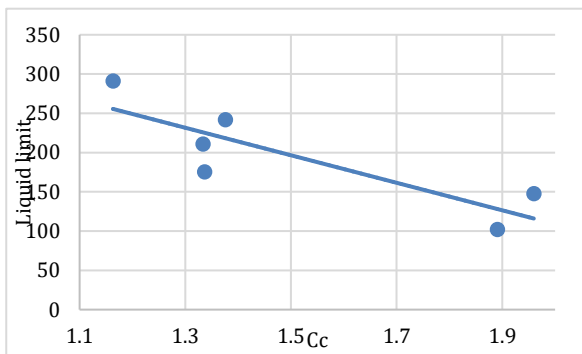
**FIGURE 18:** Variation of Liquid limit of kaolinite-sand with Cc



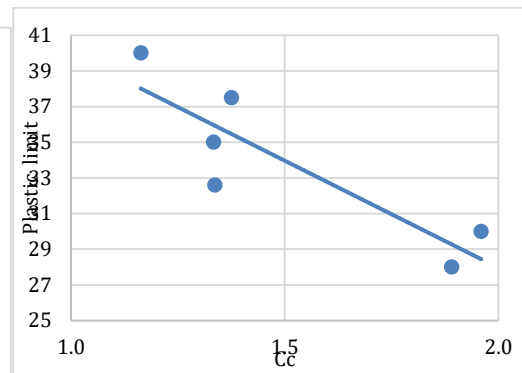
**FIGURE 19:** Variation of Plastic limit of kaolinite-sand with Cc



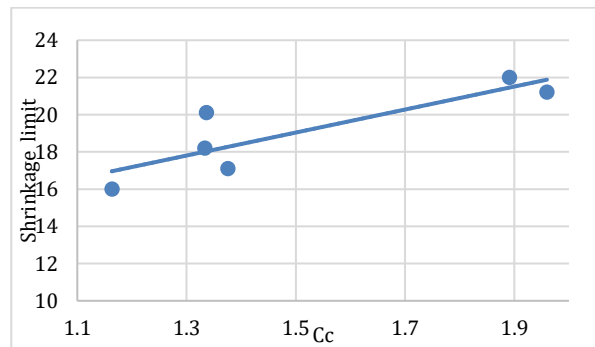
**FIGURE 20:** Variation of Shrinkage limit of kaolinite-sand with  $C_c$



**FIGURE 21:** Variation of Liquid limit of bentonite-sand with  $C_c$



**FIGURE 22:** Variation of Plastic limit of bentonite-sand with  $C_c$



**FIGURE 23:** Variation of Shrinkage limit of bentonite-sand with  $C_c$

It can be seen that as  $C_c$  of the mix proportion predominantly lies between 1 & 3 for kaolinite-sand and bentonite-sand mixture increases liquid limit (FIGURE -18) plastic limit (FIGURE -19) increases. An opposite trend is seen (FIGURE -21 and FIGURE -22).

Further which can be seen from the figures 20 to 23 , as  $C_c$  value increases , shrinkage limit also increases irrespective of clay mineralogy present in the mix proportion.

Table 4 and 5 gives the effective correlation which occurs in Kaolinite sand and Bentonite-sand mixtures with respect to  $C_u$  and  $C_c$ .



**Table 4:** Variation of index properties of Kaolinite - Sand with the Cu and Cc of the soil

Fig No	Relation	R
12	$W_L = -11.312 \cdot C_u + 73.324$	0.94
13	$W_P = -3.9837 \cdot C_u + 31.761$	0.89
14	$S_L = 0.6084 \cdot C_u + 20.524$	0.81
15	$W_L = 114.4 \cdot C_u - 157.7$	0.82
16	$W_P = 8.0459 \cdot C_u + 9.178$	0.83
17	$S_L = -4.0047 \cdot C_u + 31.388$	0.77

**Table 5:** Variation of index properties of Bentonite - Sand with the Cu and Cc of the soil

Fig No	Relation	R
18	$W_L = 35.748 \cdot C_c + 2.8599$	0.77
19	$W_P = 5.8812 \cdot C_c + 19.26$	0.87
20	$S_L = -5.6519 \cdot C_c + 27.881$	0.88
21	$W_L = -175.22 \cdot C_c + 459.38$	0.85
22	$W_P = -12.011 \cdot C_c + 51.984$	0.87
23	$S_L = 6.1766 \cdot C_c + 9.7743$	0.86

## CONCLUSIONS

Based on the experimental study on kaolinite –sand and bentonite-sand mixtures, the following conclusions were made.

- The **Grain size distribution** follows uniformly graded curve pattern in case of Kaolin- sand and Bentonite -Sand mixtures. The particles are closely packed with each other, which increases the water retention capacity of the mixtures.

### Specific Gravity

- The **specific gravity** of pure kaolinite is 2.85 and its value ranges from 2.41 to 2.85 for different mix proportions. In case of bentonite-sand mixtures the specific gravity of pure bentonite is found to be 2.9 and its value ranges from 2.38 to 2.9 for different mix proportions. It is observed that if increase in fine content of kaolinite and bentonite-sand mixtures leading to deduction in the voids and eventually leads to increase in specific gravity. The same trend is observed in bentonite sand mixtures,

### Atterberg Limits

- With the increase of percent kaolinite the liquid limit of kaolinite-sand mixtures increases from 36% to 67%. Similarly, the plastic limit is also found to increase gradually from 18% to 30%. This increase can be credited to increase in fines content in kaolinite-sand mixtures.
- The increase of percent bentonite, the liquid limit of bentonite-sand mixtures increases from 41% to 577%. Similarly, the plastic limit is also found to increase gradually from 27% to 48%. It can be concluded that increase in fines content increases the liquid and plastic limit of the bentonite-sand mixtures.

- Bentonite clay has more surface area and is highly active clay mineral and exhibits high cation capacity exchange. Due to this property of bentonite, the Liquid and plastic limit of bentonite-sand mixtures are higher than kaolinite-sand mixtures.
- The percentage increase in liquid limit and plastic limit of bentonite-sand mixtures is higher in relative comparison to kaolinite-sand mixtures because of higher cation Base Exchange capacity of bentonite in relative comparison to least active kaolinite.
- Shrinkage limit of pure kaolinite is 18% and the values decrease with the addition of kaolinite up to 21.8%. Similarly shrinkage limit of bentonite-sand mixtures varying from 21 to 12.59% this is due to shrinkage process which is a packing phenomenon rather than plasticity characters.
- There is a very good correlation between the liquid limit, plastic limit, and shrinkage limit with various proportions of kaolinite and bentonite-sand mixtures.

### Effect of Clay content on Cu and Cc of the soil

- There exists a good relation between uniformity index and coefficient of curvature with the index properties of the soil. With the increase in Cu value, the liquid limit and plastic limit decreases but this trend is reversed in case of shrinkage limit.
- Interestingly the value of Cc tends to decrease with increase in liquid and plastic limit of the soil and the reverse trend is observed in shrinkage limit of the mix proportions.

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