



# DEPARTMENT OF CIVIL ENGINEERING NEWSLETTER

Volume 11; Issue 2 | March & April 2022

--FUSION--





**Vel Tech**  
Rangarajan Dr. Sagunthala  
R&D Institute of Science and Technology  
(Deemed to be University) Estd. w/a 3rd UGC Act, 1956






**DEPARTMENT OF CIVIL ENGINEERING  
NEWSLETTER  
Mar & Apr 2022**

# **FUSION**

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Volume 11; Issue 2 | March & April 2022

## *Index*

-  Events Organized
-  Higher Education – One Credit Course
-  Faculty Contributions
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## International E-Conference

Civil Department organized Two days “International E- Conference on Novel Innovations and Sustainable Development in Civil Engineering (NISDCE’22)” on March 31 - April 01, 2022.

This conference aims to confer the endurance of structures and innovative ideas for the sustainable development of construction industry to satisfy the needs of today and tomorrow. Eminent professors of various universities from India and abroad will discuss their ideas about the theme. There is a discussion about the innovation, economics, environmental and social measures that can be applicable in the construction Industry.

The banner features the Vel Tech logo and name at the top left, followed by the School of Mechanical and Construction and Department of Civil Engineering. The main title is "2nd International E-Conference on Novel Innovations and Sustainable Development in Civil Engineering (NISDCE'22)" with dates "31st March 2022 & 1st April 2022". The background shows a modern building with a wavy, undulating roof. Below the building, it says "Through Online Platform: Google Meet". A row of logos for participating institutions is displayed, including UTM, VIT, Anna University, and others. At the bottom, contact information for Vel Tech is provided, including the address, website, and phone numbers.

**Vel Tech**  
Rangarajan Dr. Suganthala  
Rajiv Gandhi School of Mechanical Engineering  
Chennai - 600062

**SCHOOL OF MECHANICAL AND CONSTRUCTION**  
**DEPARTMENT OF CIVIL ENGINEERING**

**2nd International E-Conference on**  
**Novel Innovations and Sustainable Development in Civil Engineering (NISDCE'22)**  
**31st March 2022 & 1st April 2022**

Through Online Platform: Google Meet

Participating Institutions: UTM, VIT, Anna University, etc.

Vel Tech Address: Vel Tech Road, Vel Nagar, Chennai - 600062  
Website: [www.veltech.edu.in](http://www.veltech.edu.in)  
Phone: 1800 312 7469

### Keynote Speakers

#### International Speakers



**Dr. Parvath Alavud**  
Professor  
School of Civil Engineering  
Indira Institute of Technology  
Engineering Campus, Chennai



**Dr. Sudhakar Kumar**  
Professor  
School of Civil Engineering  
Central Institute of Technology  
& Technology (CIT), Bangalore

#### National Speakers



**Dr. V. Jeyapalan**  
Professor  
School of Civil Engineering  
Indira Institute of Technology, Chennai



**Dr. R. Ramesh**  
Associate Professor  
School of Civil Engineering  
Indira Institute of Technology, Chennai



**Dr. R. Jeyapalan**  
Associate Professor  
School of Civil Engineering  
Indira Institute of Technology, Chennai



**Dr. R. Ramesh**  
Associate Professor  
School of Civil Engineering  
Indira Institute of Technology, Chennai

### Organizing Committee

#### Chief Patron

Call: Prof. Vel Dr. R. Rangarajan  
Chairman & Founder-President

Dr. S. Sathishkumar  
Vice-Chancellor

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Dr. S. Sathishkumar  
Registrar

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Dean Academic

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Professor & Head - Department of Civil Engineering

#### Co-Chairman

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Professor

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Dr. H. Harishankar  
Associate Professor  
+91-99499-73476

Mr. T. Lakshmi Kumar  
Assistant Professor  
+91-94889-04446

#### Co-Editors

Dr. R. Rangarajan  
Associate Professor  
+91-94889-04446

Mr. D.G.S. Sivetha  
Assistant Professor

Mr. T. Vasudevi  
Assistant Professor

#### Joint Co-Editor

Mr. S. Sathishkumar  
Associate Professor

**Contact:**  
The Organizing Secretary - NISDCE'22  
Department of Civil Engineering  
Vel Tech Rangarajan Dr. Sagunthala R&D  
Institute of Science and Technology  
Avadi, Chennai - 600 062



Office Use  
+91-99499-73476



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## Vel Tech

Rangarajan Dr. Sagunthala  
R&D Institute of Science and Technology  
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### 2<sup>nd</sup> International E-Conference on Novel Innovations and Sustainable Development in Civil Engineering

## NISDCE'22

31<sup>st</sup> March & 1<sup>st</sup> April 2022



**Publications**  
All the papers accepted in the conference will be  
peer reviewed and published in:  
**EC3 Transactions Conference Proceedings**

**EC3** The International Society  
www.ec3journal.org

Indexed in Scopus  
ISSN: 1938-5962; E-ISSN: 1938-6737

**Organized by**  
School of Mechanical and Construction  
Department of Civil Engineering

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In Association with



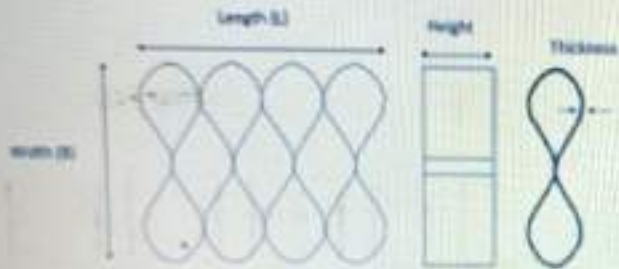
CONFIGURATIONS 8R MAT

Length (L)

Width (W)

Height

Thickness



- # WHAT IS A ROCK MASS?

  - Rock mass is very jointed and blocky (discontinuous)
  - Rock mass consists of (a) rock materials (b) rock joints
  - Discontinuities have different sizes – some are very significant in size – have huge impact in engineering

Dr. M. Vinod Kumar Chellappa

Dr. S. Ramana Chellappa

Nirudha D.G.S.

Dr. G. S. S. S. S. S.

Dr. S. S. S. S. S.

Dr. S. S. S. S. S.

1:43 PM | 100 people





International E- Conference on Novel Innovations and Sustainable Development in Civil Engineering (NISDCE'22)

### **Hands on Training on Sustainable buildings**

Civil Department in Association with Civil Engineering Students Association Organized Guest Lecture in the topic of “Sustainable Buildings - Hands on Training” on 30/03/2022. Mrs. Bhavana Chander Das, Manager, EPC Project management and business development, Chennai, delivered the hands-on training program for the students. In the morning Session training program has been presented by the resource Person. In the afternoon session there is a group discussion from the students regarding the design of green structure.





“Sustainable Buildings - Hands on Training”

## Hands on Training on Modelling of Steel Structures

Civil Department in Association with Civil Engineering Students Association Organized Guest Lecture in the topic of “Modelling of Steel Structures – Hands on Training” on 30/04/2022. Mr. N. Pradeep, BIM Manager, De Novo software solutions, A unit of PGN groups, Chennai, conducted the short course on “Application of Building Information Modelling (BIM) based on software packages” to II year and III-year students.

**Vel Tech**  
Vellore Institute of Technology

School of Mechanical and Construction  
**Department of Civil Engineering**

Guest Lecture on  
“Modelling of Steel Structures – Hands on Training”

In Association with Civil Engineering Student Association

**Resource Person**  
**Mr. N. PRADEEP**  
BIM Manager  
DE NOVO SOFTWARE SOLUTIONS, A Unit of PGN Groups, Chennai

**30/04/2022**  
10:00 AM to 12:00 Noon  
2:00 PM to 4:00 PM

Venue : CADD Lab, Room No: 2421

**In the Presence of**  
**Col. Prof. Vel. Dr. R. Ranganarajan**  
Chancellor & Founder President  
**Dr. Sugunthala Ranganarajan**  
Foundress President  
**Dr. S. Sathiyamoorthy**  
Vice Chancellor  
**Dr. S. Indrayaraj**  
Dean - SPM

**Convener**  
**Dr. A. Geetha Seshwarani**  
Professor & Head  
Department of Civil Engineering

**Coordinators**  
**Dr. S. Sathiyamoorthy**  
**Mrs. S. Srinivasan**  
**Mr. T. Uthayakumar**

No.42, Arodi - Vel Tech Road, Vel Nagar, Arodi, Chennai - 600 062. [www.veltech.edu.in](http://www.veltech.edu.in) 1800 212 7669



## One Credit Course:

### Advanced Modern Surveying Techniques

Department of Civil Engineering organised one credit course.

Course Details:

Course Code / Name: 1157CE926/Advanced Modern Surveying Techniques

Course Duration: April 3,10,17&24, 2022

Time: 08.45 AM to 12.45 PM

Resource person: Dr. Abdul Hakim Salleh, USM, Malaysia

Coordinator: Dr. G. Kumar, Associate Professor, Vel Tech.

### Student Name List

S.NO	VTU	REGISTER NO	STUDENT NAME
1	10983	18UECV0500	C. RAJESH
2	11738	18UECV0050	MAIBAM YAIKHOMBA MEETEI
3	11933	19UECV0072	SANTA SINAM
4	11934	19UECV0042	LOUREMBAM ERIC
5	11996	20UECV0057	V RAKESH
6	12035	20UECV0052	T.RAVINDRAN
7	12308	20UECV0026	MONISH PRAVEEN
8	12584	20UECV0059	M.GNANA CHARAN TEJA
9	13504	19UECV0034	KANNAPATI RAGHU VAMSI
10	13916	19UECV0045	SUSHMA
11	13942	19UECV0012	ANSHU RAJ
12	13967	19UECV0043	M.SELVA KUMAR
13	14059	19UECV0061	PRAVEEN KUMAR
14	15350	20UECV0002	A. KUSUMA HARI HARA NADHA REDDY
15	15376	20UECV0018	JOVA JOHN
16	16220	19UECV0028	GYAN KUMAR RAY
17	16273	19UECV0053	NIRMAL SUBEDI
18	16350	19UECV0080	SUBODH KUMAR YADAV
19	16832	20UECV0053	TATHAGATA MAJUMDER
20	16881	20UECV0056	V AKILAN
21	16911	20UECV0009	DINESH SHARMA GURUMAYUM
22	16915	20UECV0037	ROHEN SINAM
23	16916	20UECV0027	MUNGYAMBA HEISNAM
24	16943	20UECV0004	BHOPEN SINGH KANGUJAM
25	16974	20UECV0043	SHAIK AFREED BHASHA
26	17003	20UECV0021	KH.LOIYUMBA

27	17449	20UECV0005	B. BHAVANI PRASAD
28	17900	20UECV0033	P. AKHIL
29	18656	20UECV0010	DIPENDRA SINGH
30	18710	20UECV0046	SUJIT KUMAR SHA KANU
31	11190	19UECV0001	U. AAKASH
32	15242	19UECV0050	NATHI RAJU
33	13413	19UECV0017	BANDHARAPU RAHUL
34	21666	20UECV0600	LOLLA VENKATA SAI VAISHNAVI



## **Cost Estimation and Quantity Surveying**

### **Course Details**

Title: Cost Estimation and Quantity Surveying ( 1157CE924)

Prof: Dr. Sharifah Ahmad, USM, Malaysia

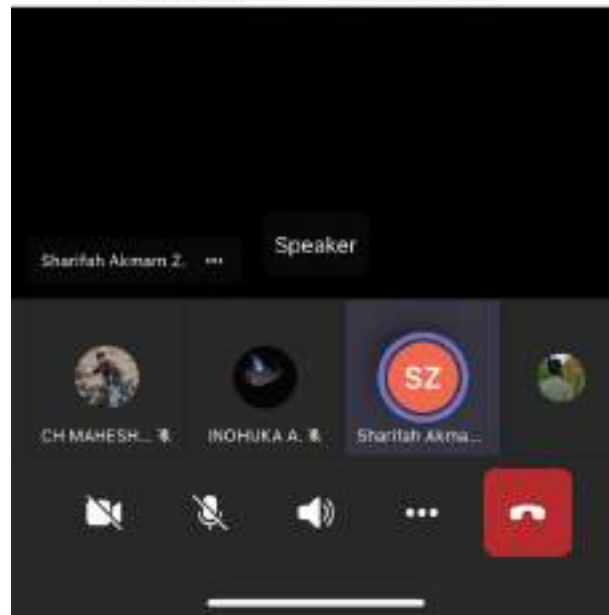
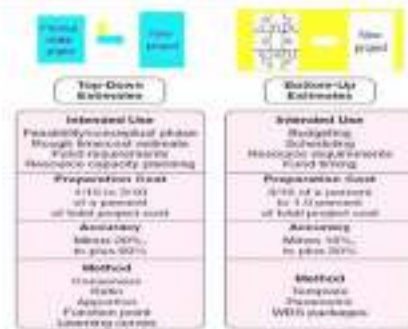
Duration: April 1,8,15,22 & 29, 2022

Timings: 8.45am to 11.45am

Co-ordinator: Mr.Cheran, Asst. Prof, Vel Tech.

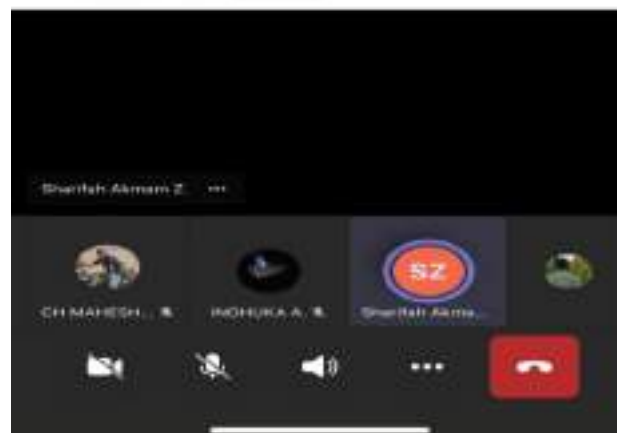
### **Student's Name List :**

S.NO	VTU	REGISTER NO	STUDENT NAME
1	vtu12976	18UECV0064	R.SAI KIRAN
2	vtu13916	19UECV0045	M.SUSHMA
3	vtu13564	19UECV0032	JUTTIGA BHUVAN SRIRAM
4	vtu12279	18UECV0018	E.JITHENDER REDDY
5	vtu13413	19UECV0017	BANDHARAPU RAHUL
6	vtu15242	19UECV0050	NATHI RAJU
7	vtu12988	18UECV0005	A.CHANDRA MOULI
8	vtu14027	19UECV0020	CH .SUDHA KIRAN TEJA
9	vtu16210	19UECV0002	AAYUSH K C
10	vtu11972	19UECV0074	SENTISHILU PONGEN
11	vtu11927	19UECV0029	IMLISUNEP JAMIR
12	vtu16499	19UECV0040	K.RAJA MOHAN
13	vtu14027	19UECV0020	CHATLA SUDHA KIRAN TEJA
14	vtu14042	19UECV0089	VIKAS DHANGAR
15	vtu15186	19UECV0019	BONDALAPATI PRADEEP KUMAR
16	vtu11529	19UECV0030	INOHUKA AYE
17	vtu13736	19UECV0049	NARAYANACHARI ANNAMALAI
18	vtu16242	19UECV0065	RAJU GHIMIRE



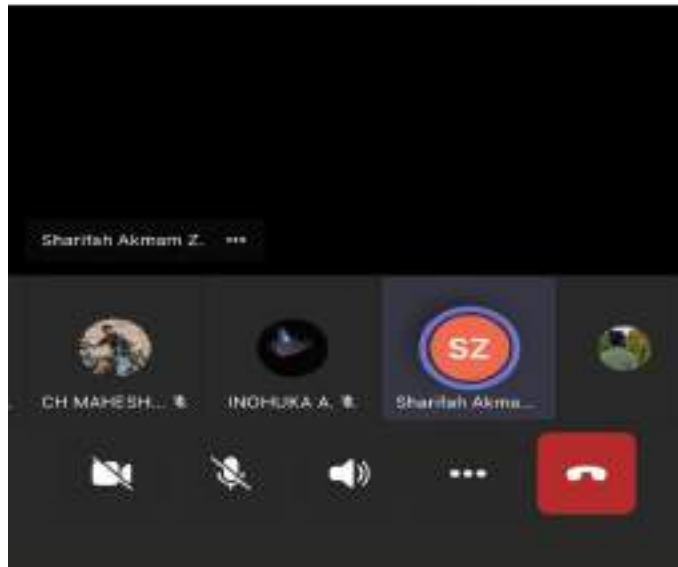
## Ques + Qsol

- These different unit costs become more important when expert judgment is factored in.
- Factory construction experts know that since the old factory was built, the firm has moved to just-in-time supply lines, thus needing less storage space.
- This enables Company A to build more production capacity in the same meter-print and increase productivity.
- The company's new plant will have an assembly area that is 1.25 times larger than the old plant's with a storage area that is only half as large.
- Now the calculation can reflect a more accurate number of units for the smaller storage and loading area, as well as the larger production area.
- $(\$300 \text{ per square meter} \times 20,000 \text{ square meters}) + (\$250 \text{ per square meter} \times 500,000 \text{ square meters}) = \$22.75 \text{ million}$



**Levels of Accuracy in Construction Cost Estimating**

Level	Name	Accuracy	Purpose/Use	Common Method
Level 1	Order of magnitude	Very low	Conceptual decisions	Analogue, parametric, expert judgment, balloting
Level 2	Feasibility	Low	Outline guidelines	Parametric, balloting
Level 3	Preliminary	Medium	Budget authorization, design decisions	Balloting, unit cost, quantity take-off
Level 4	Summary	High	Estimate control	Estimate unit cost, unit take-off
Level 5	Detailed	Very high	Unit take-off, check at work, control, performance evaluation	Unit take-off, unit cost, unit take-off



One Credit Course – Cost Estimation and Quantity Surveying

## Latest Trends in Construction

### Course Details

Course Code/ Course Name: 1157CE924/Latest Trends in Construction

Prof: Prof. Dr.Fan Su- Ling, Tamkang University, Taiwan

Duration: 04.04.2022 – 08.04.2022

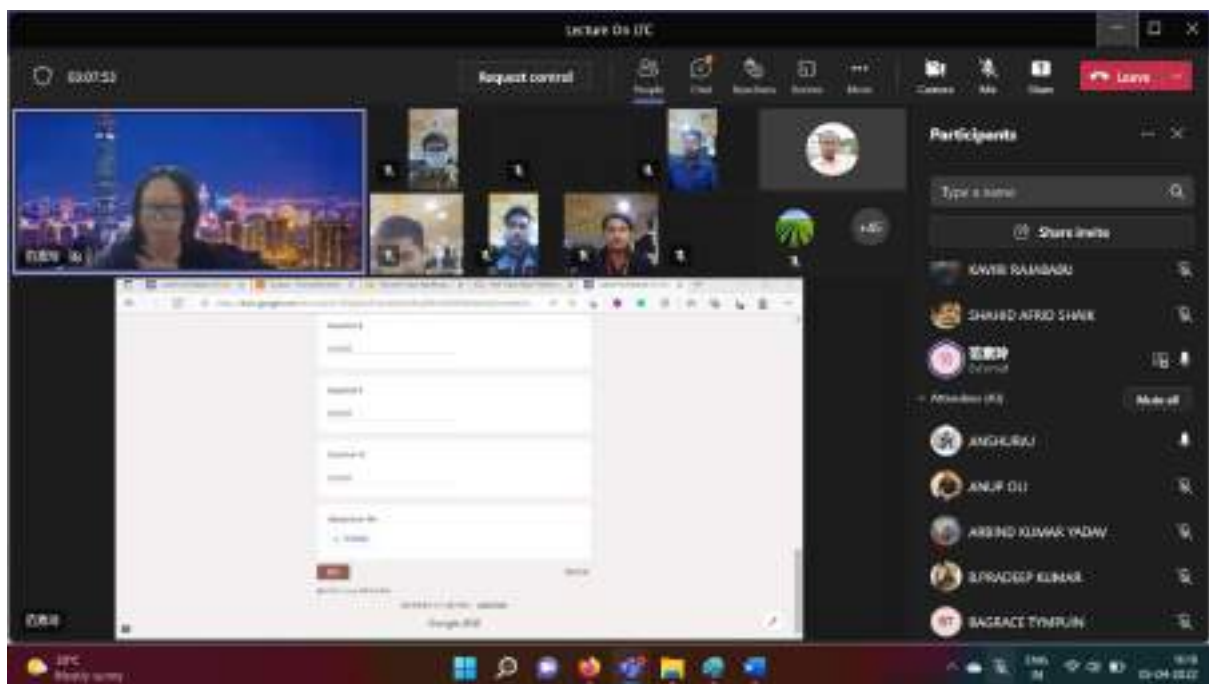
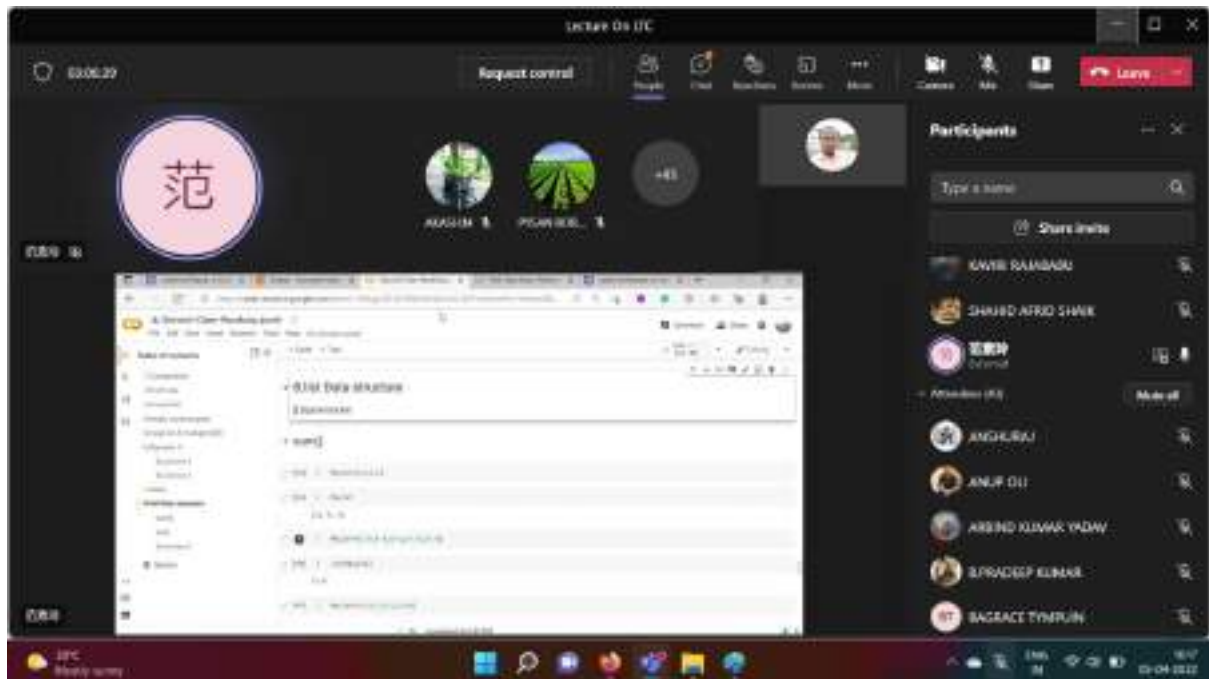
Timings: 1.45am to 4.45 pm

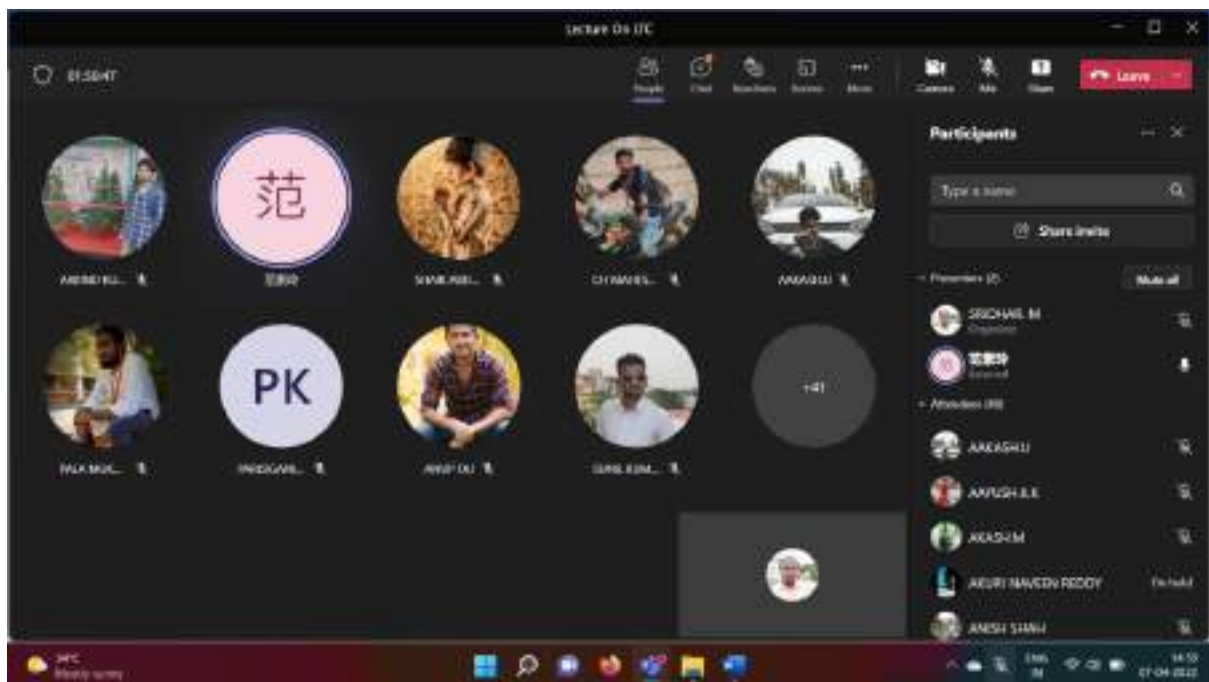
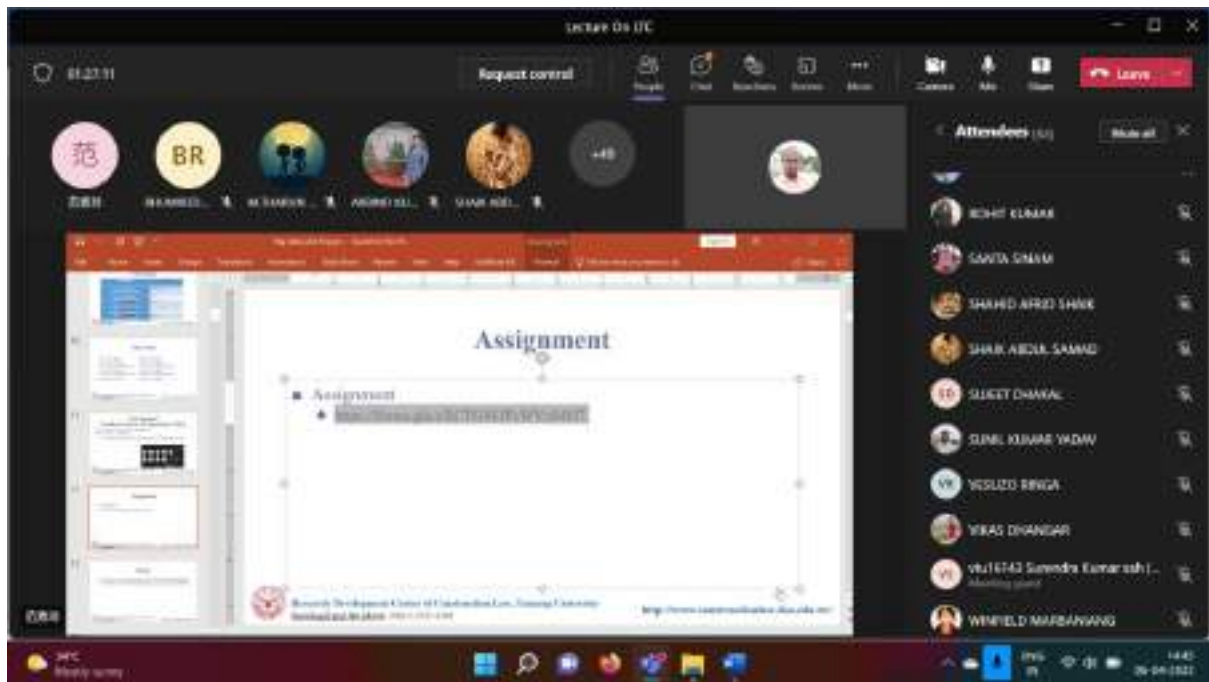
Co-ordinator: Dr.S.Kandasamy , Asso. Prof, Vel Tech.

### Student's Name List

S. NO	VTU No	Register No	Student Name
1	11076	19UECV0501	CHINGAK DANTED P PHOM
2	11077	19UECV0503	VESUZO RINGA
3	11078	19UECV0504	HENDOK
4	11190	19UECV0001	AAKASH.U
5	11798	19UECV0023	CH RAJJEV KUMAR SINGH
6	11802	19UECV0037	KEYIGUMLUNGLE IHEILUNG
7	11885	19UECV0036	KEVISEBINO NAGI
8	11932	19UECV0018	BIKU NAOREM
9	11934	19UECV0042	LOUREMBAM ERIC
10	11944	19UECV0046	MOLOCHIT
11	11954	19UECV0096	MISHALIN DIENGNGAN
12	11955	19UECV0062	PYSAN BORLANG ROBERTS LYNGDOH
13	11970	19UECV0069	ROHIT KUMAR
14	12029	19UECV0075	SHAHID AFRID SHAIK
15	12592	19UECV0033	K BALAJI
16	13278	19UECV0005	AKASH.M
17	13504	19UECV0034	KANNAPATI RAGHU VAMSI
18	13551	19UECV0076	SHAIK ABDUL SAMAD
19	13736	19UECV0049	NARAYANACHARI ANNAMALI
20	13810	19UECV0031	JAMBEY TASHI
21	13935	19UECV0006	AKURI NAVEEN REDDY
22	13942	19UECV0012	ANSHURAJ
23	13959	19UECV0016	BAGRACE TYMPUIN
24	13965	19UECV0054	NITISH KUMAR
25	13967	19UECV0043	M.SELVA KUMAR
26	14040	19UECV0055	N.TEJASWINI REDDY
27	14042	19UECV0089	VIKAS DHANGAR
28	14059	19UECV0061	PRAVEEN KUMAR
29	15122	19UECV0056	PALA MUKHESH KUMAR

30	15156	19UECV0057	PARIKSHIT PRIYADARSHI
31	15173	19UECV0026	FLINDER RAPSANG
32	15186	19UECV0019	B.PRADEEP KUMAR





One Credit Course – Latest Trends in Construction

### **Student Placements**

S. No	Vtu No	Name	Company Details	Mode of Placement
1	14536	MALLELA VINAY KUMAR REDDY	WIPRO / COGNIZANT GENC	ON CAMPUS
2	12340	KASSA SURYA CHANDRA	COGNIZANT GENC	ON CAMPUS
3	12878	SAMUEL JOHNSON E	COGNIZANT GENC	ON CAMPUS
4	14263	SAI PADMA VVV (MIG)	DXC TECHNOLOGY	ON CAMPUS
5	12134	PAMARTHI VISHNU TEJA	COGNIZANT GENC	ON CAMPUS
6	14348	KASU VENKATESH	MUSIGMA	ON CAMPUS
7	14604	KUNDELLA VENKATA SUBBAIAH	MUSIGMA	ON CAMPUS
8	11711	IMNAYANGLA JAMIR	INTELLIPAAT	ON CAMPUS
9	11697	VIGNESH U	AVASOFT	ON CAMPUS
10	12171	JILANI SYED JANI BASHA	CENTELON	ON CAMPUS
11	14311	JATOTHU PREMSAGAR	SUTHERLAND/ZELFSTUDIE	ON CAMPUS
12	10943	S VAMSHI KRISHHNA REDDY (LE)	RDC CONCRETE	OFF CAMPUS
13	12451	THOTLI INDRASENA REDDY	RDC CONCRETE	OFF CAMPUS
14	12375	GUDE ROHITH	ZELFSTUDIE/WIPRO	ON CAMPUS
15	14271	SAI CHARAN S	ZELFSTUDIE/WIPRO /INFOSYS	ON CAMPUS
16	11144	DURGA PAVAN KUMAR MYLAVARAPU	PINNACLE INFOTECH	ON CAMPUS
17	12972	SAI SANTOSHI LAKSHMI KARUMURI	SUTHERLAND	ON CAMPUS

### **Faculty Contributions**

Dr. M. Vinod Kumar

Presented paper entitled “Seismic Performance of Different Types of RC Flat Slab with Various Structural Systems under Earthquake Load”, World Conference on Architecture and Civil Engineering, (WCACE-2022), Germany, March 11-13, 2022.

Presented paper entitled "An Analytical Studies on Static and Fatigue Response of Steel Fibre and Re-Cycled Aggregate Integrated High Strength Concrete Beam”, International Conference on Recent Advances in Engineering Material, India, 03-05, March 2022.

Dr. Kandasamy

Presented paper entitled " Experimental Study on Flexural Behaviour of Glass Fibre Reinforced Concrete", NISDCE'22 in International E-Conference on "Novel Innovations and Sustainable Development in Civil Engineering "31/03/22 to 01.04.22at Vel Tech Rangarajan Dr. Sagunthala R & D Institute of Science and Technology.

Dr. J. Logeswari

Presented paper entitled " Sustainability in using RAC", NISDCE'22 in International E-Conference on "Novel Innovations and Sustainable Development in Civil Engineering " 31/03/22 to 01.04.22at Vel Tech Rangarajan Dr. Sagunthala R & D Institute of Science and Technology.

Dr. K. Tamilarasan

Presented paper entitled " Effluent therapy of electroplating industry using hybrid up flow anaerobic sludge blanket coupled with dual chambered microbial fuel cell", NISDCE'22 in International E-Conference on "Novel Innovations and Sustainable Development in Civil Engineering "31/03/22 to 01.04.22at Vel Tech Rangarajan Dr. Sagunthala R & D Institute of Science and Technology.

Dr. S. Selvakumar

P. Kulanthaivel, S. *Selvakumar*, B. Soundara, V. S. Kayavizhi and S. Bhuvaneshwari (2022), Combined effect of nano-silica and randomly distributed fibers on the strength behavior of clay soil. Nanotechnology for Environmental Engineering, 7(1), 1-10, Springer Nature Publishing, ISSN No.: 2365-6387, pp. 1-12, March 2022.

Mr. J. Saravanan

1. Presented a paper titled "Effect of sugarcane bagasse ash, lime powder & quarry dust in the performance of unburnt bricks" in International E-Conference on Novel innovations and sustainable development in Civil Engineering organized by Vel Tech Rangarajan Dr Sagunthala R&D Institute of Science and Technology on 31.3.22 and 1.4.22.

2. Participated in 5-days Online Faculty Development Programme on "Energy and Environmental Management" organized by NITTTR, Chennai on 18th-22nd April, 2022.

Mr. T. Udayakumar

Presented Paper in "SERVICE LIFE OF CONCRETE STRUCTURE USING LIFE-365 SOFTWARE" in International Conference on Materials, Mechanics and Structures (ICMMS2022)." organized by NIT Calicut, Kerala, during 10.03.22 – 12.03.22.

Presented paper entitled " Studies on Mechanical Properties of GGBS Aggregate on Geopolymer Concrete in Novel Innovations and Sustainable Development in Civil Engineering", NISDCE'22 in International E-Conference on "Novel Innovations and Sustainable Development in Civil Engineering "31/03/22 to 01.04.22at Vel Tech Rangarajan Dr. Sagunthala R & D Institute of Science and Technology.

Mrs. M. Jayadurgalakshmi

Presented Paper in "SERVICE LIFE OF CONCRETE STRUCTURE USING LIFE-365 SOFTWARE" in International Conference on Materials, Mechanics and Structures (ICMMS2022)." organized by NIT Calicut, Kerala, during 10.03.22 – 12.03.22.

Presented paper entitled " A Review on Various Alternative Materials for Coarse Aggregate in Concrete", NISDCE'22 in International E-Conference on "Novel Innovations and Sustainable Development in Civil Engineering " 31/03/22 to 01.04.22at Vel Tech Rangarajan Dr.Sagunthala R & D Institute of Science and Technology.

Ms. Mahalakshmi:

Presented paper entitled " A Study on Equipment Management in Construction Site", NISDCE'22 in International E-Conference on "Novel Innovations and Sustainable Development in Civil Engineering " 31/03/22 to 01.04.22at Vel Tech Rangarajan Dr.Sagunthala R & D Institute of Science and Technology.

### **Journal Publications**

- 1.J. Cici Jennifer Raj, *M. Vinod Kumar*, "Nonlinear Modal Time History Analysis on RC framed buildings with scrap tyre as the base isolator for Past Indian earthquakes", Springer: Journal of Building Pathology and Rehabilitation, 2022. (Scopus)
2. J. Cici Jennifer Raj, *M. Vinod Kumar*, "Seismic Protection with Different Isolation Materials", Indian Journal of Environmental Protection, Vol. 42, No. 1, 2022, Pages 71-79. (Scopus)
3. J. Cici Jennifer Raj, *M. Vinod Kumar*, "Seismic response of low-to-high peak ground acceleration earthquakes in RC framed buildings with scrap tyre as base isolator using fast nonlinear analysis technique", Springer: Asian Journal of Civil Engineering, Building and Housing, 2022. (Scopus)
4. J. Saravanan, "Conceptualization of Community Washing Room for Rural water conservation" in Ecology, Environment and Conservation, ISSN: 0971-765X. Vol 28 Issue 1. 2022. (Web of Science Indexed)
5. Jayadurgalakshmi. M and Kandasamy. S " A Comparative study on the Various Alternative materials for Fine Aggregate in concrete" Materials Today Proceedings; 5 May 2022  
<https://doi.org/10.1016/j.matpr.2022.04.670>

### **Indian Patent Filed**

1.Indian Application no.: 202241020483

Date of Filing in India: 05.04.2022

Title: RECYCLABLE SCRAP TYRE RUBBER PAD BEARINGS WITH RCC COLUMN CAPPING AND METHOD THEREOF

Applicants: *Dr. M. VINOD KUMAR*, Mrs. J. CICI JENNIFER RAJ, Mr. S. SHABARISH

2. Indian Application no.: 202241020407

Date of Filing in India: 05.04.2022

Applicant: Dr. J. Logeswari, Mr. R. Rajeshwaran, Mr. A. Jagathan Prakaash

Title: SANDWICH WALL INFILLED FRAMED STRUCTURE WITH OPENINGS

3. Indian Application no.: 202241020628

Date of Filing in India: 05.04.2022

Applicant: Jayadurgalakshmi. M; Mr. Udhaya kumar. T, Dr.S. Kandasamy

Title: COMPOSITE MATERIAL FOR CONCRETE STUCTURES.

4. Indian Application no.: 202241020482

Date of Filing in India: 05.04.2022

Applicant: Mr. Udhaya kumar. T; Dr.S. Kandasamy

Title: PREFABRICATED WALL PANELS USING GEOPOLYMER AGGREGATE CONCRETE

### **NPTEL Course:**

1. Dr. S. Selvakumar, successfully completed the 8 Weeks AICTE approved FDP course on “Expansive Soil”.
2. Mr. J. Saravanan, Successfully Completed the 12 weeks course on “Understanding Incubation and Entrepreneurship “Got Elite and Silver.
3. Mr. J. Saravanan, Successfully Completed the 8 weeks course on “Design Technology and Innovation “Got Elite and Silver.

### **Student achievement:**

Third Year Student “SURENDRA KUMAR SAH (VTU16143) cleared the GATE-2021 Competitive Exam.

## **Student Article:**

### **ROBOTICS IN BUILDING TECHNOLOGY**

**Anish Shah – VTU 16241 – III Year**

With the industry facing increased environmental regulation and the need for more cost-effective buildings, robotic automation reduces waste by improving quality and consistency, which is significant when it's estimated that up to a quarter of material transported to a building site leaves as waste<sup>3</sup>. With automation and digital solutions, builders can also design waste out at the beginning of a project through effective building design and construction processes.

With more than 200,000 vacancies for low and high-skilled workers in the EU alone in Q2 2020, the industry labor shortage is a growing issue, with younger people put off construction careers by perceptions that it is a dangerous occupation. Construction workers account for around 30 percent of workplace injuries and are up to four times more likely to be involved in a fatal accident vs. other sectors, with an estimated 108,000 fatalities every year worldwide<sup>5</sup>.

Robots can make construction safer by handling large and heavy loads, working in unsafe spaces and enabling new, safer methods of construction. Using robots for the repetitive and dangerous tasks that people increasingly don't want to do means automation can help support the industry's labor and skills crisis and make construction careers more appealing to young people.

"A new focus on health, safety and sustainability are catalysts for investment in robotics, while the shrinking pool of skilled labor means the construction industry needs robots to help keep pace with the challenges of urbanization and climate change," added Atiya. "We are putting our expertise and industry-leading portfolio of robots and digital tools at the center of the construction industry value chain with automation solutions for faster, more affordable and sustainable construction, while supporting the industry's labor shortage, by handling large and heavy loads, accessing dangerous spaces and enabling new, safer ways of building."

## **Technical Note by Student**

### **International Green Building Certifications**

**P. Bhavani – VTU 21605 – II Year**

Green building rating or green certification are systems used to assess and recognize buildings that meet the green requirements and standards. These tools follow standard approaches applied to the planning, design, construction, operation and maintenance, renovation, and demolition phases of the green building.

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#### **1. Leadership in Energy and Environmental Design (LEED)**

Country of origin: USA

Managing organization: U.S. Green Building Council

Year: 1998

Applications: New construction, existing buildings & operations, maintenance, schools, commercial interiors, healthcare, homes, and neighborhood development.

#### **2. Building Research Establishment Environmental Assessment Method (BREEAM)**

Country of origin: United Kingdom

Managing organization: BRE Global

Year: 1990

Applications: New construction, interiors, existing commercial buildings, and urban areas, renovation

#### **3. Deutsche Gesellschaft für Nachhaltiges Bauen (DGNB)**

Country of origin: Germany

Managing organization: German Sustainability Council

Year: 2007

Applications: New construction, existing buildings, urban areas, commercial interiors, and renovations.

#### **4. Green Star**

Country of origin: Australia

Managing organization: Green Building Council of Australia (GBCA)

Applications: New buildings (single-family homes excepted), interiors, renovations, existing buildings, and urban areas.

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