



## Report on Series of Workshop on “Geometrical Interpretation of Mathematical Concepts”



(1<sup>st</sup> Session - 7<sup>th</sup> June 2014, Saturday)  
(2<sup>nd</sup> Session – 28<sup>th</sup> - 29<sup>th</sup> November 2014, Friday- Saturday)

### INTRODUCTION:

Gujarat Technological University in association with DASS Scientific Research Labs Private Limited (DASS SRL), Ahmedabad, had organized two Mathematics Workshops consecutively on “**Geometrical Interpretation of Mathematical Concepts**”. The first mathematics workshop was organised on 7<sup>th</sup> June 2014. This was a one day workshop. Encouraged by the positive feedback, the two days mathematics workshop was organized on 28<sup>th</sup> and 29<sup>th</sup> November 2014. The mathematics workshop is specially focussed on a new system for Mathematics Teaching and Demonstration developed by Mr. Chanchal Dass. This report summarises the outcome of the workshops.

### ABOUT THE WORKSHOP:

Math is the key subject in every sphere of life. Be it solving complex equations, bargaining, natural phenomenon or simple house hold work, everywhere math plays its essential role. The conventional methods of solving problems involve high end calculations and complex concepts. Many times without understanding the actual problem, we follow and apply the mathematical concepts mechanically.

This workshop was meant to help participants and professionals to visualize few important mathematical concepts, so that they can correlate these into any other form and develop a quick understanding of a problem and instantly find a method for its solution logically. The workshop provided few tricks that would help to analyze a problem without any complexity.

The first workshop started with welcoming all the faculties from different colleges by Ms Roma Thakur and it was followed by motivational speech by **Honourable Vice Chancellor, Dr Akshai Aggarwal**. He revealed the purpose of the workshop, to be able to develop Mathematics as a tool for the engineers. Mathematics is the language of engineers. He also introduced Mr Dass, expert of this mathematics workshop, and he emphasized on practical demonstrations to be showed to the students in a class through videos etc. and thus making the class more interesting. He motivated all faculties to experiment in a class by taking 20 minutes in discussing pure applications and rest 40 minutes in equations etc.

**Dr G P Vadodaria, Registrar (I/C)** also warmly welcomed all the faculties and Mr Chanchal Dass and discussed about how the mathematics is an integral part of engineering at all levels and the need for developing technical tools to make the subject easier and understandable. He talked about Mr Dass's achievements in the particular domain and how his experience could be fruitful in developing and enhancing skills of faculties and students of GTU.

The second workshop was organised on 28<sup>th</sup> and 29<sup>th</sup> November 2014. Ms Roma Thakur briefed the participants about the workshop and introduced Mr Chanchal Dass to the participants. As a part of the research activity, Dass SRL has made arrangements for video shooting of the whole workshop for future reference and promotion. Participants were interviewed during the lunch break about their understanding of mathematics and the workshop.

## TOPICS COVERED:

The main emphasis of the workshop was to remove abstractness of mathematics. Every mathematical concept was explained geometrically with geometrical meaning. The workshop started with a concept that we are all mathematicians and we don't know that we all know math. Here the speaker emphasized that everything around the world is following some or other mathematical formulas. He talked about the early days of civilization when mathematics started evolving with natural numbers and followed the long path to reach modern days mathematics. To establish the point that math is not difficult, it was explained that when number systems are many, number of mathematics branches are more; the binary operations are limited to five only. Again it was explained that when the mathematical systems are infinite in numbers, their functional relationship is expressed by lines. So if we can master to handle two types of lines, then we can solve any mathematical function. This finding is the backbone of the new mathematics teaching and demonstration technique. The innovator then took advantage of matrix multiplication to explain how dynamism can be added to the abstract analytical methods. Here the innovator introduces the homogeneous coordinate system which helps in explaining many mathematical concepts. Here the speaker introduces how the advancement of technology can be used for solving complex mathematical problem. Here he used Microsoft Excel extensively to model and visualise mathematical problems. He then explained the calculus, linear algebra, differential equations, Infinite series, Taylor/Mclaurin Series, Fourier series, Laplace Transformation, Partial Differentiation, etc. from a new perspective. It summarises with the idea that for simplification of mathematical processes, we divided the mathematics into different branches and in doing so we forgot to integrate it.

## PARTICIPANTS:

The workshops were targeted for Faculties of Mathematics and students of ME and PhD working on mathematical modelling from different Engineering colleges and Research Scholars. A total of **109 participants responded** for attending the first workshop. But considering the limitation of attending large number of participant during workshop, **only 36 (Thirty Six) participants** were confirmed for the first math workshop. The participants were from different geographical areas like Ahmedabad, Basna, Bhavnagar, Gandhinagar, Khatraj, Kalol. Mehsana, Patan, Rajkot, Savli, Surat, Tuwa, Vadodhara, Vahelal and Visnagar. Due to paucity of time, many of the topics like Calculus, Linear Algebra, and Differential Equations could not be covered in the first workshop. Due to this reason, Mr Chanchal Dass thought of organizing the second workshop for two days. He insisted to limit the workshop **for 20 participants** only as participants require to do hands on practice of many mathematical concepts. Accordingly the second workshop was organised for two days. Within three days of publication of the circular for registration, the registrants crossed sixty and the circular was withdrawn. **24 faculties** participated in the workshop.

## FEEDBACKS:

The participants were asked to rate the expert as well as the GTU workshop. **Average score for the expert was 8.19 and the workshop was 8.07 out of 10 with a standard deviation of 1.49 and 1.8 for the first workshop.** Six participants have rated the expert as 10 out of 10. All these scores indicate the math workshop as excellent one.

For the second workshop, few participants rated the expert qualitatively and some participants scored quantitatively. The scores of the second workshop along with number of respondents are given below:

Score	Number of Respondent
9 out of 10	10
Excellent	8
Very Good	3
Best	1
Good	1
8.5 out of 10	1
8 out of 10	1
<b>Total</b>	<b>25</b>

Few Comments from Participants of First Workshop:

1. The workshop was good but Application of Mathematics in Engineering and Real world Problems should have been covered. Kindly organize this type of workshop to improve GTU faculties and students.

***Barot Bhavika Nikhilkumar, Faculty,  
Hansaba College Of Engineering & Technology, Sidhpur, Patan.***

2. The workshop was good but Industrial or application based Mathematics should have been covered. It should have 2 experts. One should cover theory and other would cover practical uses.

***Ramesh Kumar Joshi, Student,  
Shantilal Shah Engineering College, Bhavnagar.***

3. The workshop was excellent. Complex Analysis, Numerical Methods, ODE, PDE on MATLAB Software should have been covered. Instead of 1 day it must be of 2 or 3 days.

***Dipti Tapiawala, Faculty,  
K J Institute of Engineering and Technology, Savli***

4. The workshop was very good. Integration based topics could have been covered in this workshop. Please arrange a workshop for MATLAB.

***Ankit Sharadchandra Acharya, Faculty,  
Hasmukh Goswami college of Engineering, Ahmedabad***

5. It's a better way to understand all mathematical related concepts.

***Chirag Somani, Faculty,  
Engineering College, TUWA.***

6. Arrange 2 or 3 days workshop to cover more topics.

**Rakesh Kumar Amrutlal Raval, Faculty,  
Merchant Engineering College, Basna.**

7. 2 or 3 days workshop for this type of topics which will extend the knowledge and apply it practically should be organized.

**Tejas B Shah, Faculty,  
Hasmukh Engineering College, Vehelal, Ahmedabad.**

8. I suggest that this kind of lecture series should go on and it is very helpful to both, students and faculties.

**Shreekant P Pathak, Student,  
S V National Institute of Technology, Surat.**

9. One day is not enough for such in-depth workshop.

**Dipak N Shukla,  
ITM University, Vadodara**

## **Few Comments from Participants of Second Workshop:**

1. It was really good. We have learned which we never did before. GTU should conduct this type of workshops.

**Priti Patil, Faculty,  
Venus International College of Technology, Gandhinagar**

2. It was really good. We have learned something extra ordinary in this workshop.

**Sweta Shah, Faculty,  
Sigma Institute of Engineering, Vadodara.**

3. Expert is having nice practical clarity so if practical concepts are focussed more then it will be more beneficial.

**Vanita Kewlani, Student,  
L J College, Ahmedabad.**

4. GTU should arrange this kind of workshops every month.

**Avani Matad,  
Shree Swaminarayan Institute of Technology, Bhat**

5. Arrange such kind of workshops frequently.

**Mahesh A Yeolekar, Faculty,  
Amiraj College of Engineering and Technology, Sanand.**

## **ABOUT THE SPEAKER:**

Mr. Chanchal Dass, FIE is a Fellow of Institution of Engineers (Mechanical Engineering) with Post Graduate Diploma in "Operations Research" and Masters of Business Administration in Financial Management. He has worked in a position of Development Strategy Executive in ONGC for 22 years as Reservoir Engineer. He has invented a Multiple Zone Oil and Gas Production Technology, an Electronic Contract Bridge Gaming Application and a new system for Mathematics Teaching and Demonstration. He is a Life Member of Indian Mathematical Society, Society of Petroleum Engineers (SPE), Society of Petroleum Geophysicists (SPG), Indian Mathematical Society and American

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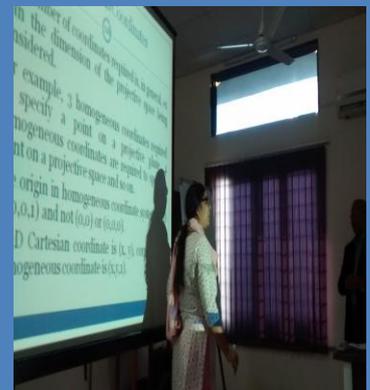
Mathematical Society. He has published and presented numerous papers and attended various National and International Conferences, forums and Seminars around the world. He has floated two start-up companies - Dass SRL and Dass OTPL to carry out fundamental research in different technological fields. He has been selected as one of the finalist for World Oil Award in the Innovative Thinker Category. He has also received SPE (Society of Petroleum Engineers) President Award, SPE Regional Service Award for Middle East, North Africa and India. He also received ONGC Director, Regional Director and Project Manager's Award. His Innovative Multiple Zone Well Completion Technology was selected among top 50 technologies in the India Innovation Growth Program 2010. His innovative technology is Contract Bridge Gaming Application has been selected in the 10000 start-up initiative organized by NASSCOM. He is an expert level bridge player and participated World Bridge Championship held at China during October 2014. He is an expert in reservoir engineering and consultant to Jindal Petroleum Company.

## PHOTO GALLERY:

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