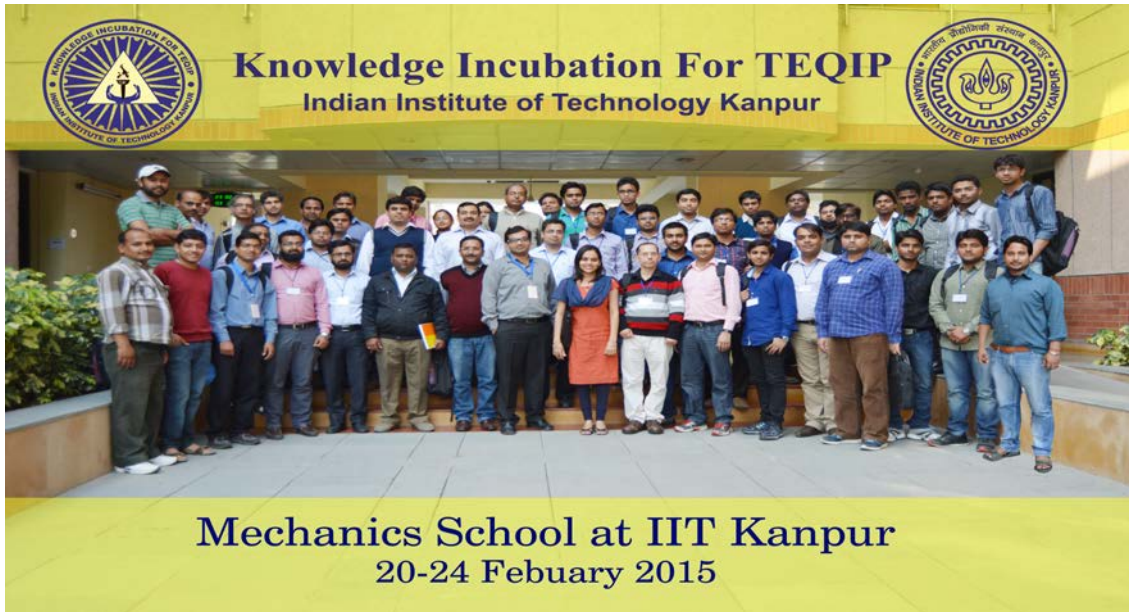




KNOWLEDGE INCUBATION FOR TEQIP, IIT KANPUR

## **Mechanics School at IIT Kanpur**

February 20 - 24, 2015



TEQIP workshop ‘Mechanics School at IIT Kanpur’ intended at introducing its participants to the basic fundamentals of mechanics and applied mathematics which should be emphasized while teaching a course on these subjects to undergraduate students. This event was designed adhering to the feedbacks of participants from previous similar workshops. For the first time a workshop with parallel sessions was organized by KIT, IIT Kanpur. The idea was to make the event flexible for participants, so that they can chose to attend the lectures they are truly interested in. There were small group of people in the class rooms but the attendees and the speakers could interact in a more effective way as both of them shared same enthusiasm towards the subject being discussed.

The first day of the school focused on the tools from applied mathematics which are frequently used by researchers in the field of Mechanics. Then there were parallel sessions of lectures on fluid mechanics, solid mechanics and dynamics and vibrations for next 4 days. Last two days of this workshop were reserved for research symposium in this school. It aimed at giving the participants an opportunity to present their research work and discuss it with the experts in their field at IIT Kanpur.

# TOPICS DISCUSSED

## Engineering Mathematics

- Complex Variables
- Linear algebra
- Fourier series
- Differential equations
- Asymptotic approximations

## Dynamics

- Coordinate Systems, Vectors and Tensors: Symmetric and anti-symmetric tensors, Rotation tensor, Eigen values/vectors
- Rotation and Angular Velocity, Velocity and acceleration formulae for particle
- Rigid body kinematics: 2D and 3D
- Linear momentum, angular momentum and kinetic energy for rigid bodies, Inertia tensor: definition and computation
- Balance Laws, Free body diagrams, Problem formulation
- Vibration of SDOF system, Response to harmonic, periodic and transient excitation
- Vibration of TDOF system, Normal modes, Response to harmonic, periodic and transient excitation
- Extension to MDOF systems, Examples
- Example/Introduction to vibration of continuous systems

## Fluid Mechanics

- Continuum, Definition of fluid, kinematics
- RTT, Conservation of mass and linear momentum
- Stress; Deformation; Newton's law of viscosity; Navier-Stokes' equation
- Euler-Bernoulli equation; Total energy equation; applications
- Dimensional Analysis
- Stokes flow
- Potential Flows
- Boundary layer: Prandtl's approximation, Zero and non-zero Pr Grad B L
- Similarity solutions of boundary layer and free shear layer
- Practical applications

## Solid Mechanics

- Review of Strength of Material and its limitation. Small Strain in 3D
- Stress Components in 3D, Physical Interpretation, Principal Stresses
- Cauchy Principle, Stress Equilibrium Equations
- Constitutive Law Linear Elastic Solid, Isotropy, Orthotropy, Transverse Isotropy
- Navier's Equations, Stress and Displacement Approaches, Compatibility
- Formulation of BVP, Plane Problems
- Math Preliminary - Divergence and Transport Theorems, Kinematics
- Balance Laws
- Constitutive Relations, Objectivity, Material Symmetry, Kinematic and Thermodynamic Constraints
- Finite Elasticity Problems, and touch upon Fluid Flow

## LIST OF SPEAKERS

- Prof. Anindya Chatterjee, IIT Kanpur
- Prof. Anurag Gupta, IIT Kanpur
- Prof. Basant Lal Sharma, IIT Kanpur
- Prof. Debopam Das, IIT Kanpur
- Prof. Ishan Sharma, IIT Kanpur
- Prof. Naveen Tiwari, IIT Kanpur
- Prof. Pankaj Wahi, IIT Kanpur
- Prof. Shakti Gupta, IIT Kanpur
- Prof. Sovan Lal Das, IIT Kanpur
- Prof. Sumit Basu, IIT Kanpur

## PARTICIPATING INSTITUTES

Institute	Number of Participants
AMU	8
HBTI, Kanpur	5
College of Engineering, Thalassery, Kerala	3
National Institute of Technology, Jalandhar	2
School of Engineering,CUSAT, Kochi	1
N.C. College Of Engineering (Israna)	3
National Institute of Technology, Warangal	1
Bundelkhand Institute of Engineering and Technology, Jhansi	1
IFTM, Moradabad	1
MNNIT Allahabad	1
G. B. Pant Engineering College, Pauri, Garhwal	4
Jadavpur University	3
Madan Mohan Malaviya University Of Technology Gorakhpur	13
BTKIT Dwarahat	3
NIT Kurukshetra	1
Cambridge Institute of Technology, Ranchi	2
Government Engineering College, Bilaspur	1
Thiagarajar college of engineering	1
Government College of Engineering, Salem	5
College of technology Pantnagar	3
College of engineering and management Kolaghat	3
PEC University of Technology	1
<b>Total</b>	<b>66</b>

## WORKSHOP SCHEDULE

February 20, 2015

Time	Event
8: 30 AM -9:00 AM	<b>Registrations</b>
9:00 AM – 10:10 AM	<b>Complex Variables</b> <i>Prof. Anirban Guha</i>
10:10 AM – 10:40 AM	<b>Coffee break</b>
10:40 AM – 11:50 AM	<b>Linear algebra</b> <i>Prof. Anindya Chatterjee</i>
11:50 AM – 1:00 PM	<b>Fourier Series</b> <i>Prof. Basant Lal Sharma</i>
1:00 PM – 2:30 PM	<b>Lunch break</b>
2:30 PM – 3:40 PM	<b>Differential equations</b> <i>Prof. Anirban Guha</i>
3:40 PM – 4:10 PM	<b>Tea break</b>
4:10 PM – 5:20 PM	<b>Asymptotic approximations</b> <i>Prof. Anindya Chatterjee</i>

February 21, 2015

Time	Event	
9:00 AM – 10:30 AM	<i>Fluid</i>	<b>Continuum, Definition of fluid, kinematics</b> <i>Prof. Naveen Tiwari</i>
	<i>Dynamics</i>	<b>Coordinate Systems, Vectors and Tensors: Symmetric and antisymmetric tensors, Rotation tensor, Eigen values/vectors</b>
	<i>Solid Mechanics</i>	<i>Review of Strength of Material and its limitation. Small Strain in 3D</i> <i>Prof. Shakti S Gupta</i>
10:30 AM – 11:00 AM	<b>Coffee break</b>	
11:00 AM – 12:30 AM	<i>Fluid</i>	<i>RTT, Conservation of mass and linear momentum</i> <i>Prof. Debopam Das</i>
	<i>Dynamics</i>	<b>Rotation and Angular Velocity, Velocity and acceleration formulae for particle</b>
	<i>Solid Mechanics</i>	<b>Stress Components in 3D, Physical Interpretation, Principal Stresses</b> <i>Prof. Sumit Basu</i>
12:30 AM – 2:00 PM	<b>Lunch break</b>	

2:00 PM – 3:30 PM	<i>Fluid</i>	<b>Stress; Deformation; Newton's law of viscosity; Navier-Stokes' equation</b> <i>Prof. Naveen Tiwari</i>
	<i>Dynamics</i>	<b>Rigid body kinematics: 2D and 3D</b>
	<i>Solid Mechanics</i>	<b>Cauchy Principle, Stress Equilibrium Equations</b> <i>Prof. Sumit Basu</i>
3:30 PM – 4:00 PM	<b>Tea break</b>	
4:00 PM – 5:30 PM	<i>Fluid</i>	<b>Problem Solving</b> <i>Prof. Naveen Tiwari &amp; Prof. Debopam Das</i>
	<i>Dynamics</i>	<b>Problem Solving</b>
	<i>Solid Mechanics</i>	<b>Problem solving</b> <i>Prof. Shakti S Gupta and Prof. Sovan Lal Das</i>

**February 22, 2015**

<b>Time</b>	<b>Event</b>	
9:00 AM – 10:30 AM	<i>Fluid</i>	<b>Euler-Bernoulli equation; Total energy equation; applications</b> <i>Prof. Debopam Das</i>
	<i>Dynamics</i>	<b>Linear momentum, angular momentum and kinetic energy for rigid bodies. Inertia tensor: definition and computation</b> <i>Prof. Pankaj Wahi</i>
	<i>Solid Mechanics</i>	<b>Constitutive Law Linear Elastic Solid, Isotropy, Orthotropy, Transverse Isotropy</b> <i>Prof. Sovan Lal Das</i>
10:30 AM – 11:00 AM	<b>Coffee break</b>	
11:00 AM – 12:30 AM	<i>Fluid</i>	<b>Dimensional Analysis</b> <i>Prof. Naveen Tiwari</i>
	<i>Dynamics</i>	<b>Balance Laws, Free body diagrams, Problem formulation</b> <i>Prof. Pankaj Wahi</i>
	<i>Solid Mechanics</i>	<b>Navier's Equations, Stress and Displacement Approaches, Compatibility</b> <i>Prof. Sovan Lal Das</i>
12:30 AM – 2:00 PM	<b>Lunch break</b>	
2:00 PM – 3:30 PM	<i>Fluid</i>	<b>Stokes flow</b> <i>Prof. Naveen Tiwari</i>
	<i>Dynamics</i>	<b>Problem Solving</b> <i>Prof. Pankaj Wahi</i>
	<i>Solid Mechanics</i>	<b>Formulation of BVP, Plane Problems</b> <i>Prof. Sovan Lal Das</i>
3:30 PM – 4:00 PM	<b>Tea break</b>	

4:00 PM – 5:30 PM	<i>Fluid</i>	<b>Problem Solving</b> <i>Prof. Naveen Tiwari &amp; Prof. Debopam Das</i>
	<i>Dynamics</i>	<b>Problem Solving</b> <i>Dr. Ishan Sharma</i>
	<i>Solid Mechanics</i>	<b>Problem solving</b> <i>Prof. Shakti S Gupta</i>

**February 23, 2015**

<b>Time</b>	<b>Event</b>	
9:00 AM – 10:30 AM	<i>Fluid</i>	<b>Potential Flows</b> <i>Prof. Debopam Das</i>
	<i>Dynamics</i>	<b>Vibration of SDOF system. Response to harmonic, periodic and transient excitation</b> <i>Prof. Shakti Gupta</i>
	<i>Solid Mechanics</i>	<b>Math Preliminary - Divergence and Transport Theorems, Kinematics</b> <i>Prof. Anurag Gupta</i>
10:30 AM – 11:00 AM	<b>Coffee break</b>	
11:00 AM – 12:30 AM	<i>Fluid</i>	<b>Boundary layer: Prandtl's approximation, Zero and non-zero Pr Grad B L</b> <i>Prof. Naveen Tiwari</i>
	<i>Dynamics</i>	<b>Vibration of TDOF system. Normal modes. Response to harmonic, periodic and transient excitation.</b>
	<i>Solid Mechanics</i>	<b>Balance Laws</b> <i>Prof. Anurag Gupta</i>
12:30 AM – 2:00 PM	<b>Lunch break</b>	
<b>Research Symposium &amp; Laboratory visit</b>		
2:00 PM – 2:30 PM	<b>Acoustic Streaming in a thermo-acoustic refrigerator</b> <i>Dr. Yasser Rafat, AMU</i>	
2:30 PM – 3:00 PM	<b>LES of turbulent channel flow under high temperature gradient</b> <i>Dr. Syed Fahad Anwer, AMU</i>	
3:00 PM – 3:30 PM	<b>Coffee Break</b>	
3:30 PM – 4:30 PM	<b>Lab Visits</b>	
7:30 PM Onwards	<b>Workshop Dinner</b>	

**February 24, 2015**

Time	Event	
9:00 AM – 10:30 AM	<i>Fluid</i>	<b>Similarity solutions of boundary layer and free shear layer</b> <i>Prof. Debopam Das</i>
	<i>Dynamics</i>	<b>Extension to MDOF systems. Examples.</b>
	<i>Solid Mechanics</i>	<b>Constitutive Relations, Objectivity, Material Symmetry, Kinematic and Thermodynamic Constraints</b> <i>Prof. Anurag Gupta</i>
10:30 AM – 11:00 AM	<b>Coffee break</b>	
11:00 AM – 12:30 AM	<i>Fluid</i>	<b>Practical applications</b> <i>Prof. Naveen Tiwari</i>
	<i>Dynamics</i>	<b>Example/Introduction to vibration of continuous systems</b>
	<i>Solid Mechanics</i>	<b>Finite Elasticity Problems, and touch upon Fluid Flow</b> <i>Prof. Anurag Gupta</i>
12:30 AM – 2:00 PM	<b>Lunch break</b>	
<b>Research Symposium</b>		
2:00 PM – 2:30 PM	<b>Effects of polymer chain model resolution on the steady state in shear flow</b> <i>Dr. Indranil Saha Dalal, IIT Kanpur</i>	
2:30 PM – 3:00 PM	<b>Measurement of laminar to turbulent transition location using temperature sensitive paint in helicopter rotor blades</b> <i>Dr. Satish Mariappan, IIT Kanpur</i>	
3:00 PM – 3:30 PM	<b>Role of Elastic and Surface anisotropy in Quantum Dot Formation in Si-Ge Heteroepitaxial Systems</b> <i>Mr. Gopal Dixit, IIT Kanpur</i>	
3:30 PM – 4:00 PM	<b>Coffee Break</b>	
4:00 PM – 4:30 PM	<b>Segregation and Rheology of Binary Granular Mixtures</b> <i>Dr. Anurag Tripathi, IIT Kanpur</i>	
4:30 PM – 5:00 PM	<b>A novel segregation mechanism in horizontally shaken binary granular mixtures in Christmas tree channel</b> <i>Dr. Ashish Bhateja, IIT Kanpur</i>	
5:00 PM	<b>Closing of the event and Feedback session</b>	

## SUMMARY of FACULTY FEEDBACK

### WORKSHOP SESSION

<b>Questions</b>	<b>Excellent</b>	<b>Good</b>	<b>Ordinary</b>
Clarity of communication about	16	06	01
Organization of the sessions	20	03	00
Quality of lectures	15	08	00
Effectiveness of discussions	13	10	00
Effectiveness of learning experience	11	10	00
	<b>Appropriate</b>	<b>Short</b>	<b>long</b>
Duration of workshops	21	01	01
	<b>Definitely</b>	<b>Maybe</b>	<b>No</b>
Would you like to have more such sessions?	19	03	01
Would you like e-lectures by experts on special topics?	20	03	00



Suggest specific topic that you would like additional expert lectures on

- More lectures must be delivered about realistic problems.
- Computational methods and Functional analysis.
- Turbulent shear flow, Buoyancy in fluids, Advanced CFD
- Rheology, Fluid statics.
- Teaching methodologies for technical education.
- Fracture, measurements.
- Kinematics, Dynamics, Quality Control
- Introduction to Rotor Dynamics
- Plasticity using large deformation theory and other material models.
- Dynamics , Solid Mechancis
- Analytical dynamics, Control of Dynamic Systems, Non-linear vibration, Mechanics of stochastic systems, Dynamics of Electro dynamical systems etc.
- It could be covered in more detailed with real life problems
- A complete course with practical should be conducted like design of machine, vibrations with problems, mechanics of solid.
- Lectures on fluid power
- Bio-Mechanics
- Non-Linearity.
- Instability
- Chaos
- Non Newtonian Flow
- Non-Linear Mechanics.
- Experimental lab demonstration on various subjects like FM, heat transfer.
- CFD
- Molecular Simulation Modelling.

Additional Suggestions

- Engg mechanics, Fluid Machinery.
- Short term course on experimental basis.
- Based on the feedback of the industries topics of discussion to be decided. Focus should be on the topics which can help the students of average category getting the placement after B.tech/M.tech
- There could be a follow up workshop which takes it from here like a season-2 of the lecture series.
- Would be more effective if projector is used in the place of board.
- Some lectures were excellent some were good and some ordinary, so I have marked as an average good.
- Lectures notes/ reading materials could have been matter.
- Organize such workshop on experimental fluid mechanics
- Keep it on to enhance technical knowledge.
- Some courses should be introduced specially on software training and their use.
- Please conduct these sessions during summer or winter vacation.
- Software training.

**TEACHING**

<p>Which subjects do you teach?</p>	<ul style="list-style-type: none"> <li>• Fluid Mechanics.</li> <li>• Thermodynamics, Energy Conversion and Engineering Mechanics.</li> <li>• Fluid Mechanics, Numerical Methods Chemical Engg. Design.</li> <li>• Mechanics , Thermodynamics, metrology , measurement, material handling</li> <li>• Machine design and applications, Machine drawing both manual and auto Cad.</li> <li>• Manufacturing Science, Kinematics, Machine Drawing</li> <li>• Finite Element Method Engineering Mechanics Theory of Plasticity.</li> <li>• Fracture Mechanics, Vibrations</li> <li>• Engineering Mechanics, Dynamics, Rotor Dynamics</li> <li>• Machine Design, Fluid Machinery, Robotic Engg.</li> <li>• Thermodynamics, I.C Engines, Gas Turbine, Thermal Power Engineering.</li> <li>• Machine Design, Graphics and Drawing.</li> <li>• Solid Mechanics, Concrete Structure.</li> <li>• Heat transfer</li> <li>• Fluid Mechanics and Thermodynamics.</li> <li>• ATP</li> <li>• Transport Phenomena</li> <li>• Engineering Statics.</li> <li>• Mass Transfer, Thermodynamics</li> </ul>	
<p>What is average student to teacher ratio in your institute?</p>	<ul style="list-style-type: none"> <li>• 10:01</li> <li>• 16:01</li> <li>• 22:01</li> <li>• 14:01</li> <li>• 75:01</li> <li>• 10:01</li> <li>• 10:01</li> <li>• 50:01</li> <li>• 30:01</li> <li>• 14:01</li> <li>• 20:01</li> <li>• 20:01</li> <li>• 20:01</li> <li>• 20:01</li> <li>• 12:01</li> </ul>	
<p style="text-align: center;"><b>Questions</b></p>	<p style="text-align: center;"><b>YES</b></p>	<p style="text-align: center;"><b>NO</b></p>
<p>Do you have additional support for teaching (tutors, graders, teaching Assistants, etc)?</p>	<p style="text-align: center;">05</p>	<p style="text-align: center;">16</p>
<p>Do you give class projects for UG classes?</p>	<p style="text-align: center;">17</p>	<p style="text-align: center;">04</p>

Do you give class projects for PG classes?	15	05		
Do you have sufficient resources for laboratory courses?	08	13		
	<b>Sufficient</b>	<b>Inadequate</b>		
Is the library/journal/e-connection Support adequate?	08	12		
	<b>Definitely</b>	<b>May be</b>	<b>No</b>	
Would you like to have common (TEQIP) repository of course material ?	16	05	00	
Would you like to visit IITK to participate in and develop course material (existing or new)	14	07	00	
Would you like to participate in creation of the repository material (course files/lab. Manuals/question bank/etc)	13	08	00	
	<b>e-courses</b>	<b>Workshops</b>	<b>Content</b>	<b>none</b>
How can IITK effectively help you prepare for teaching?	15	15	04	00

How can TEQIP help improve your teaching?

- TEQIP provides platform enhancing the vision for improving research and teaching aids.
- Sharing teaching experiences.
- Some of the speakers are really good which not only review the topics but also polished the teaching skills through good discussions. This helps a lot in development of teaching aid.
- Conducting more workshops in various areas of chemical engg.
- E-course, workshops, training.
- Have a brush up of the basics.
- In depth learning of certain topics.
- Improve pedagogical skills
- By giving opportunity to attend above type of classes also in the field of manufacturing Science, Kinematics, thermodynamics etc.
- By giving opportunity to visit various labs concerned with the subjects as IITK or any other IIT's of our country.
- By giving opportunity of more interaction with the lab staff of IIT.
- In a year at least twice above type of schools would benefit better in teaching.
- By organizing such workshops for longer duration during summer vacation.
- It help us in how to deliver lecture in the class.
- It will help me in organizing the lecture units, including new topics.
- The courses to be conducted in a manner in which the application of theory should be covered with various examples, More structured courses materials etc.
- Organizing such workshop, Faculty development program.
- By giving or familiarization with current research or giving deep knowledge (Technical).
- By organizing such training school and by providing lecture notes on different subjects.
- Different Resources.
- With these short term courses and interactions with subject experts faculty can improve a lot and will be beneficial.
- Conduction of different modes of teaching classes.
- Improving our knowledge by having specific workshops or faculty development programs.
- By involving in short term research with faculty of IIT.

## SUMMARY of STUDENT FEEDBACK

### WORKSHOP SESSION

Questions	Excellent	Good	Ordinary
Clarity of communication about workshop	10	07	00
Organization of the sessions	17	00	00
Quality of lectures	15	02	00
Quality of labs	15	02	00
Effectiveness of discussions	10	06	00
Effectiveness of learning experience	12	03	00
	<b>Appropriate</b>	<b>Short</b>	<b>long</b>
Duration of workshop	15	02	00
	<b>Definitely</b>	<b>Maybe</b>	<b>No</b>
Would you like to have more such sessions?	16	00	00
Would you like e-lectures by experts on special topics?	16	01	00
Suggest specific topic that you would like additional expert lectures on	<ul style="list-style-type: none"> <li>• Flow dynamics (behavior of turbulent flow in oceans).</li> <li>• Structural Engineering.</li> <li>• Non Newtonian fluid transitions, heat and mass transfer.</li> <li>• Thermodynamics and heat transfers.</li> <li>• Production Technology</li> <li>• Manufacturing and Thermal.</li> <li>• Strength of Material.</li> <li>• Design</li> <li>• Fracture Mechanics: how to make use of complex variables in modeling problems in fracture.</li> <li>• Advance manufacturing science</li> </ul>		

Additional Suggestions	<ul style="list-style-type: none"> <li>• Research based program on the effectiveness of specified field of interest.</li> <li>• Should be a brief introduction on the research being carried out at the respective IIT.</li> <li>• If there will be same one month workshop on fluid mechanics for research scholar from maths deptt. Then it will be really helpful.</li> <li>• This was a very good experience. It will be good if there will be some workshop on practical classes only. So that one can learn some practical things too by learning about different machines here which is not available in every colleges.</li> <li>• This was an excellent session and must be conducted throughout the year.</li> </ul>
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#### LEARNING

Questions	Yes	No	
Do you get enough class projects?	14	02	
Is the learning adequate?	15	02	
Do you have sufficient resources for laboratory courses?	10	05	
What is your area of specialization	<ul style="list-style-type: none"> <li>• Structural Engineering.</li> <li>• Fluid Mechanics, Heat &amp; Mass Transfer, Boundary layer Theory.</li> <li>• Heat Transfer</li> <li>• Applied Thermodynamics, Machine Design.</li> <li>• Fluid and manufacturing.</li> <li>• Design.</li> <li>• Fracture.</li> <li>• Manufacturing Science</li> </ul>		
	<b>Sufficient</b>		<b>inadequate</b>
Is the library/journal support/e-connection adequate?	12	02	
	<b>Definitely</b>	<b>Maybe</b>	<b>No</b>
Would you like to have common (TEQIP) repository of course material?	14	02	00
Would you like to visit IITK to attend specialized courses?	15	01	00
Would you like MOOCS/e-resources based courses?	12	03	00

<p>How can TEQIP help improve your learning?</p>	<ul style="list-style-type: none"> <li>• Providing adequate chances of interacting and knowledge gain program with the person of interest with whom you want to be guided by.</li> <li>• Experts are here to listen our doubts, problems special lectures and same workshop to write good research topic.</li> <li>• By providing more and more such workshops thought the years.</li> <li>• E-lectures (recorded) or live session can be organized at different TEQIP centres on the subjects requested.</li> <li>• By workshop and e-lectures.</li> <li>• By providing video lectures by current teachers of IITK.</li> <li>• By faculty exchange program.</li> <li>• It is good to organizing such workshop and conference as well.</li> </ul>
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#### RESEARCH

Questions	Definitely	Maybe	No
Would you like to visit an IIT for a short visit /internship/post-doctoral stint ,if offered(via TEQIP)?	17	00	00
Would you like to share/use research infrastructure at IITK, if made available?	15	02	00
Would you like to conduct collaborative research with IITK faculty?	17	00	00
Would you like lectures by experts (Indian and international) on niche research areas/topics?	14	03	00
Do you want special-topic conferences?	16	00	01



How can TEQIP help improve your research?

- Resource development on other institutes also. And give chance to further communicate with the person specialized in area of interest of fellow.
- By giving brief overview on the research of concerned students.
- Workshops on any subject like fluid mechanics help to improve our basics to do good research.
- A communication system and student transfer program can be established or at least students should be allowed to get their research work done in the available laboratories of different TEQIP centers, for those who like such laboratories.
- By providing experts guidance for my field.
- By conducting more such workshop.
- By providing lab facility to interested people.

## OUTCOME

Mechanics school at IIT Kanpur familiarized its participants to essential teaching techniques in the field of mechanics and applied mathematics. The idea of parallel sessions was really appreciated by participants, as for the first time they could choose to attend lectures according to their interest. This format led to a very energetic environment in this workshop. The research symposium part gave the participants an excellent opportunity and platform to present their research work and discuss about it with experts in that field at IIT Kanpur. In the lab visit session participants showed keen interest in visiting IITK for few weeks/months to use the lab facilities for their research and requested KIT to facilitate such visits for them. Apart from this, on the last day of the workshop, participants were encouraged to interact with faculty members at IIT Kanpur to explore future research collaborations and discuss teaching methodologies so that they can hone and expand their pedagogical skills.

In future KIT, IIT Kanpur hopes to organize more of such events as participant's feedbacks were very positive and highly encouraging. The participants appreciated all the aspects of this event and expressed their wish to be a part of such events in future as these workshops provide them an excellent opportunity to interact with their peers from other institutes, build new contacts in their field and discuss their research work and teaching methods.