भारतीय प्रौद्योगिकी संस्थान गुवाहाटी
Indian Institute of Technology Guwahati

Workshop

A Workshop
on
Virtual Experiments in Mechanical Engineering

November 2nd – 6th , 2020

Conducted by:
Department of Mechanical Engineering

Organized by:
Knowledge Incubation for TEQIP
Centre for Educational Technology
URL: http://www.iitg.ac.in/cet

ABOUT THE COURSE / EVENT

Due to COVID-19 pandemic situation student are unable to attend their practical lab classes across the country. To benefit them, a workshop **"Virtual Experiments in Mechanical Engineering"** is designed, which will cover all practical syllabus in the field of Mechanical Engineering for UG students. It includes Strength of Material, Material science, Fluid Mechanics, Mechatronics, Robotics, Thermal Science, Turbomachinery, Theory of Machine and Metrology Lab. The course will be through ***video lectures*** with step-by-step explanation of each ***experiment*** by our ***expert faculty*** and ***staff members***. This workshop will help the participants to get more crystal clear understanding of the practical experiments and it will help their further studies.

Note: One dedicated session is allocated for the pedagogy.

COURSE CONTENTS

- ***Strength of Materials:*** Tensile testing, hardness, torsion, beam bending, photo-elasticity, beam deflection, column buckling, thin cylinder, fatigue testing and impact testing.
- ***Material Science:*** Microscopic techniques, determination of volume fraction of different phases in material including metals, estimation of grain sizes, study of heat affected regions in welded steel specimen, effect of different medium cooling on hardness, microstructure study of MS hardened through different medium cooling, Introduction to crystallography, measurement of residual stress, indentation creep.
- ***Fluid Mechanics:*** Free and Forced Vortex, Head Losses in Piping System, Flow through restrictive passage such as Venturimeter/ Orificemeter etc., Air Flow Bench (Drag Force measurement on cylindrical bodies, Bernoulli's Equation applied to a Convergent-Divergent passage, Round Turbulent Jet, Flow around a bend in a duct).
- ***Kinematics of Machines:*** Demonstration of various mechanisms, gear systems, screw jack, jib crane, worm and worm & worm wheel, building of mechanism.
- Mechatronics and Robotics: Use of data acquisition systems, programming a virtual instrument using standard interfaces.
- ***Turbomachinery:*** Propeller Turbine, Impulse (Pelton) and Reaction Turbine, Centrifugal Pump (Series and Parallel Pump), Positive Displacement Pump (Plunger Pump).
- ***Theory of Machines:*** Static and dynamic balancing (multi-plane) of rotary systems, gyroscope, governors, whirling of shafts, simple and compound pendulums, determination of moment of inertia using trifilar suspension, torsional vibration.
- Metrology and 3D printing.
- Heat Transfer & I. C. Engine related experiments.

Experimental results and practical lab classes are upmost necessity for students, with this course almost all experiments of different laboratories are included through online virtual mode.

ELIGIBILITY

The course/event is open to Faculty members/Students (strike off, whichever is not applicable) from TEQIP III mapped Institutions/Engineering Colleges/ATUs. No course fee is charged. TA & DA for the eligible participants will be reimbursed from their respective institutions.

BOARDING AND LODGING

Since the workshop is through online virtual mode, so, there will be no boarding and lodging facilities for the participants.

IMPORTANT DATES

The last date for the receipt of duly sponsored application:
By email: scanned copy: 22/10/2020
Hard copy must reach by: 25/10/2020
Intimation of selection: 25/10/2020

SELECTION CRITERIA

Number of seats: 100
Selection will be based on First cum first served basis.

ADDRESS FOR CORRESPONDENCE

Prof. Santosha K. Dwivedy
Course Coordinator
Department of Mechanical Engineering
Indian Institute of Technology Guwahati
Guwahati- 781 039
https://www.iitg.ac.in/engfac/dwivedy/public_html/HOME.html

Email: dwivedy@iitg.ac.in, vemeiitg.2020@gmail.com

Ph.: 0361-258-2670 (O), 4670(R)

Application Form

1. Name (block letters):

2. Sex: ☐ Male ☐ Female

3. Category: ☐ General ☐ Reserved

4. Highest Academic Qualification:

5. Specialization:

6. Designation & pay scale:

7. Name of the organization:

8. Experience:

   (a) Teaching: (b) Industrial:

9. Address for communication:

Pin code: Mobile No.:

E-mail:

Please register me for the course on **"Virtual Experiment in Mechanical engineering"** to be held via ***online mode*** at IIT Guwahati.

I am sending an advance copy of this application by email to the coordinator of the course.

I undertake to send the Hard copy signed by the Head of my Institution.

Place:

Date: *Signature of the applicant*

SPONSORSHIP / NOMINATION CERTIFICTE

Prof/Dr./Mr./Ms./Mrs./.....

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is an employee of our institute and his/her application is hereby sponsored/nominated. The applicant is permitted to attend the short-term course **"Virtual Experiment in Mechanical engineering** at IIT Guwahati during 02/11/2020 to 06/11/2020 if selected.

I also certify that our institute/college is under the "Institution List" of 3rd phase of TEQIP Project of MHRD.

Date

Signature of Authority

Designation

Official Seal

Selected participants will be informed by e-mail. The duly sponsored/nominated application form should be mailed to:
(Name of the Course Coordinator)
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Department/Center of XXXX XXXX

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North Guwahati, Guwahati-781 039, Assam
Ph. No. 0361-xxxxx(O), xxxxxxxx (M)
Email.: xxxxxxxxx@iitg.ac.in

ABOUT TEQIP

TEQIP conceived in pursuance of the NPE-1986 (revised in 1992) by Govt of India as a long term program to be implemented in different phases. After successful execution of TEQIP II, TEQIP III starts from 2017-18 as Central Sector Scheme with a focus on the Low Income States, Northeast, Hill States and Islands. The third phase of TEQIP is also special in a way that it incorporates twinning arrangements between mentee & mentor institutions with an emphasis on Focused Training (PT) and Focused Interventions from IITs in terms of deliverables and accountability. KIT, established at IIT Guwahati under 2nd phase of TEQIP is a focal point for training Faculty, Staff and students from TEQIP-III institutions in Knowledge Engineering, Content Creation, Improving Teaching, Pedagogy & administrative skills in identified niche areas/disciplines.

ABOUT KIT

KIT (**K**nowledge **I**ncubation Cell for **T**EQIP) at IIT Guwahati functions as a multi-disciplinary as well as interdisciplinary Innovation Incubation Centre with a focus to impart Knowledge, infusing innovation and leading a path to achieve academic excellence. Its activities are in the area of improving quality of technical education, incubator of Innovative Ideas; implementer of contemporary pedagogy practices and development of Learning Content in Technical institutions while mentoring them.

ABOUT IIT GUWAHATI

SNAP OF CAMPUS

IIT Guwahati campus is spread over a sprawling 785 hectares plot of green land on the north bank of the river Brahmaputra around 25 km from the heart of the city. With hills and vast open spaces, the campus provides an ideal setting for training. Details on how to reach IITG Campus are available on the institute website

Website: www.iitg.ac.in