Mechanical Vibration and Acoustic Noise - Measurement, Analyses, Diagnostics and Attenuation

Training Programme
by
Dream Catcher Consulting Sdn Bhd

02 - 04 Dec 19
Dream Catcher Consulting Sdn Bhd, Penang

303-4-5 & 303-4-6 Block B, Krystal Point
Jln Sultan Azlan Shah 11900 Sg Nibong Penang, Malaysia
http://dreamcatcher.asia
enquiry@dreamcatcher.asia
+604 640 7111 / 7112
+604 640 7110
Synopsis

SBL-Khas 4576

This is a course of continuing education for working engineers in technical fields relevant to noise and vibration. It covers the fundamentals and bridges to practical analysis, thus bypassing complex mathematical modelling and extended practical approaches to noise and vibration analysis and testing.

This course is intended for practicing mechanical engineers, reliability engineers, and designers concerned with practical aspects of vibration diagnosis and acoustics of engineering systems. The course will provide guidance relevant to equipment design, consideration on dynamics of vibratory systems, the use of computer software, and practical solutions for maintenance improvement.

It is also the emphasis of the course to provide a sound understanding of the relevant phenomena and concepts in order to enable the participants to address a wide range of practical problems insightfully, and some basic noise and vibration problem solving skills.

The course instructor will draw on his extensive experience to illustrate the subject matter with practical examples.

What You Will Learn

- Basic concepts of noise and vibration
- Concepts and techniques for vibration isolation and absorption
- Vibration measurement techniques and analysis
- Basic set up for vibration testing and testing parameters
- Computer software for vibration prediction and analysis
- Noise measurement and attenuation methods
- Determination of sound pressure and sound power
- Practical approach to determine sound power
- Environmental noise and room acoustics
- Practical cases studies to highlight and relate theories, analysis, techniques and real engineering systems

Who Should Attend

- Mechanical engineers and designers
- Product engineers
- Reliability engineers
- Shock and vibration test engineers
- HVAC contractors
- Automotive engineers
- Aircraft maintenance engineers
- Railway technicians and engineers
- Construction site and environmental noise controller

Although the participants are not required to have in-depth knowledge in this field, some prior acquaintance with basic vibration knowledge and experience should be helpful.
Prerequisite

Technical background or working experience in mechanical, production, civil, transport or environmental engineering disciplines.

Course Methodology

This course is conducted in a seminar room.

Course Duration

3 day(s), 9am - 5pm

Course Structure

Day 1
- Introduction to vibration
- Fundamentals of mechanical vibration phenomena
- Equations of Motion - Newtonian Method
- Free and forced vibration
- Solutions with Laplace transform
- Resonance and damping
- Vibration absorption
- Vibration isolation
- Multi degree of freedom vibration analysis

Day 2
- Practical vibration systems
- Fourier transform in vibrations analysis
- Transfer function and modal analysis
- Vibration testing and analysis
- Introduction to finite element method
- FEM software for vibration analysis: ANSYS
- Vibration measurement techniques
- Practical cases and problem solving of vibration and noise examples

Day 3
- Fundamental of noise and acoustics
- Structure-borne noise and airborne noise
- Noise measurement and analysis
- Practical case studies
  1. Vacuum cleaner noise and vibration
  2. Hair dryer sound power measurement
  3. Active noise control of fan noise
  4. Survey method for sound power measurement of vacuum cleaner
  5. Vibration testing
Course Instructor(s)

Prof Dr Andy Tan

Andy CC Tan received his BSc(Eng) and PhD degrees in Mechanical Engineering from the University of Westminster, London. He is an adjunct professor of Mechanical Engineering in the Faculty of Science and Engineering of the Queensland University of Technology, Australia and currently a professor of Mechanical Engineering at Universiti Tun Hussein Onn Malaysia. Internationally, he is an adjunct professor of Universiti Indonesia and Jiangsu University.

His research interests include noise and vibration condition monitoring and sensor development for machine and structural health monitoring. He applied adaptive signal processing and blind deconvolution algorithms to enhance the desired signals corrupted by noise into incipient fault detection and machine diagnostics/prognostics. These algorithms together with acoustic emission technique are currently being used in low speed machinery condition monitoring, diesel engine health monitoring, and bridge structures health monitoring. He expanded his research in vibration control to the development of bi-ventricular assist device as artificial heart to enhance life style and prolong live for final stage heart failure patients. He explored the use of electrical impedance properties of Carbon-nano tube (CNT) for applications as sensors for bridge structure health monitoring and condition monitoring of diesel engine. His academic subjects include dynamics of mechanical systems, noise and vibrations, and mechanical design.

His working career includes Test Engineer with Ford Motor Company (UK) and Senior Executive with Singapore Technology Corporation before joining QUT as a lecturer and subsequently promoted to professor. As an academic/researcher, he has published over 240 refereed scientific and technical publications. His professional career includes guest editor of Australia Journal of Mechanical Engineering, board member of numerous international conferences, reviewer of numerous journals, and invited to speak in seminars and conferences. Internationally, he is a fellow of ISEAM and a vice-president of ISAE. He receives several national and international awards for his contribution in engineering education.

While working in the UK he participated actively in professional activities and was elected Chairman of the Graduate and Student Section of the IMechE, London Branch. He continued his professional activities when moved to Australia. He was a committee member of the IEAust Queensland Division, Mechanical Branch, and subsequently elected Chairman of the Branch. He represented Qld Division in IEAust College of Mechanical Engineers for a number of years. He is a Chartered Professional Engineer (CPEng) and Fellow of the Institution of Engineers, Australia.
## Administrative Details

### Programme Logistics

**Duration:** 3 day(s), 9am - 5pm  
**Date:** 02 - 04 Dec 19  
**Venue:** Dream Catcher Consulting Sdn Bhd, Penang

Morning break, lunch and tea break will be provided throughout the course duration. Course Manual and Certificate of Attendance will be provided.

### Your Investment

<table>
<thead>
<tr>
<th>Condition</th>
<th>Price per Pax</th>
<th>SST (6%)</th>
<th>Price per Pax incl SST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular fee</td>
<td>RM3,640.00</td>
<td>RM218.40</td>
<td>RM3,858.40</td>
</tr>
<tr>
<td>Early bird discount for registration before 04-Nov-2019. N/A for SBL KHAS</td>
<td>RM3,310.00</td>
<td>RM198.60</td>
<td>RM3,508.60</td>
</tr>
<tr>
<td>Group discount for every 3 pax registered, receive 1 complimentary seat</td>
<td>RM3,640.00</td>
<td>RM218.40</td>
<td>RM3,858.40</td>
</tr>
</tbody>
</table>

Additional cost may incur for customization or extra material request. Course fee is 100% claimable from PSMB (SBL scheme) in accordance to PSMB guidelines.

### 3 Easy Steps to Register

- **Phone** +604 640 7111 / 7112  
- **Fax registration form** to +604 640 7110  
- **Email registration form** to register@dreamcatcher.asia
Method of Payment

Crossed cheque / bank draft made in favour of DREAM CATCHER CONSULTING SDN BHD.
Registration form
together with payment to be couriered to:
Dream Catcher Consulting Sdn Bhd
303-4-5 & 303-4-6
Block B, Krystal Point
Jln Sultan Azlan Shah
11900 Sg Nibong
Penang, Malaysia
Payment must be received no later than 10 working days before the course commences. An
undertaking may be accepted in cases where payment is delayed. However all payments must
be made before the course commences.
Closing registration date is 18-Nov-2019.

Refund and Cancellation

Fees will only be refunded in full for cancellation received in writing more than 10 working days
prior to the commencement date. Substitute attendee(s) will be accepted at no extra charge.

Disclaimer

Dream Catcher Consulting Sdn Bhd reserves the right to change the instructors, date and to
vary/cancel the programme should unavoidable circumstances arise. All effort will be taken to
inform participants of the changes. Upon sending the registration form, you are deemed to
have read and accepted the terms.

Enquiries

call us at +604 640 7111 / 7112 or email us at enquiry@dreamcatcher.asia
Registration Form

Course Title: Mechanical Vibration And Acoustic Noise - Measurement, Analyses, Diagnostics And Attenuation
Course Date: 02 - 04 Dec 19
Location: Dream Catcher Consulting Sdn Bhd, Penang

(Emails are required to ensure notification of any changes reach the participant)

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Job Title</th>
<th>Department</th>
<th>Email</th>
<th>Mobile Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Amount

(Emails are required to ensure notification of any changes reach the participant)

Submitted by:
Company Name: ________________________________
Company Address: ______________________________
Contact Person: __________________ Designation: _________________
Dept: __________________ Phone: __________________
Email: __________________

Please complete this form with an authorised signature below and fax to fax registration form to +604 640 7110 or email to email registration form to register@dreamcatcher.asia. Call us at phone +604 640 7111 / 7112 for any enquiry.

Authorised Signature: ________________________________
* Please print full name (authorised signature) if you submit via email

Name: __________________ Designation: _________________
Dept: __________________ Date: __________________

This registration is invalid without a signature. Payment must be made no later than 10 working days before the course commences. An undertaking may be accepted in cases where payment is delayed. However all payment must be made before the course commences. Participants who registered but did not attend will be invoiced accordingly. Fees will only be refunded in full for cancellation received in writing more than 10 working days prior to the commencement date. Substitute attendee(s) will be accepted at no extra charge.

Please send payment with this form to
Dream Catcher Consulting Sdn Bhd
303-4-5 & 303-4-6
Block B, Krystal Point
Jln Sultan Azlan Shah
11900 Sg Nibong
Penang, Malaysia

Enclosed cheque/bank draft no __________________________ made in favour of DREAM CATCHER CONSULTING SDN BHD