

UBC School of Population & Public Health

# Ergonomics of Heavy Equipment Design and Whole Body Vibration



**COURSE DATE:** 'C Wc VYf '%) ž' &\$%&

**LOCATION:**

C.K. Choi Building for The  
Institute of Asian Research

University of British Columbia  
1855 West Mall, Conference  
Rm 120  
Vancouver, BC

**TIME:**

9:00 am - 4:00 pm

[www.spph.ubc.ca](http://www.spph.ubc.ca)



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THE UNIVERSITY OF BRITISH COLUMBIA

## In industrial sectors such as mining, construction, forestry, oil and gas, transportation and agriculture, operators use heavy equipment, machinery and vehicles to move materials.

Drivers and operators of heavy equipment are potentially exposed to serious musculoskeletal injuries. A physical hazard is whole body vibration (WBV), which is energy that enters the body through the seat of the vehicle to the operator's spine. WBV and repeated shocks and impacts from rough terrain can also exert effects on the entire body or a number of organs in the body.

WBV can also work in combination with awkward postures, including prolonged and/or static sitting and repetitive motions to operate controls, to result in fatigue and health risks. Musculoskeletal injuries can be exacerbated by poor ergonomic design of cabs, seats, visibility, controls and displays.

This interactive workshop has the following objectives and offers an opportunity for you to discuss the equipment and ergonomic and vibration concerns in your workplace and its operation:

At completion of this interactive workshop, participants will be able to -

- Assess aspects of equipment ergonomics such as seating design, posture, access and egress, visibility, and design of dials and displays;
- Understand health effects resulting from exposure to whole body vibration, especially back pain and other disorders;
- Be familiar with human factors design guidelines, and ISO standards and regulations for measuring and evaluating whole body vibration;
- Implement solutions to prevent and reduce exposure to whole body vibration and the subsequent back pain and disorders.

# PROGRAM

9:00-9:30 a.m.	<b>Introduction of participants and instructor</b> Overview of agenda and course objectives
9:30-10:00 a.m.	<b>What is ergonomics?</b> How does ergonomics apply to heavy equipment design? What are the outcomes of poorly designed equipment for an operator? -through group interaction, the various aspects of equipment design (such as visibility, seating and vibration) will be discussed as will the outcomes for operators with poorly designed equipment (such as accidents, errors, back disorders, etc.)
10:00 - 10:15 a.m.	<b>BREAK</b>
10:00-10:45 a.m.	<b>Ergonomics and heavy equipment design</b> Anthropometry - the size and shape of humans Seating design and posture The operator's workspace, including features of access and egress systems (steps, handholds, platforms, etc.).
10:45 - 11:30 a.m.	<b>Ergonomic aspects of visibility and its relationship to posture.</b> Important features in the design of controls and displays.
11:30 - 12:00 a.m.	<b>Introduction to whole body vibration and the health affects related to vibration</b>
12:00 - 1:00 p.m.	<b>LUNCH</b>
1:00 - 1:30 p.m.	How whole-body vibration is measured and the standards and guidelines for exposure (including WCB regulations, ISO standards and vibration dose) and typical levels for different equipment
1:30 - 2:00 p.m.	<b>Assessments of ergonomic factors in equipment design</b> - performing a task analysis, understanding worker concerns
2:00 - 2:30 p.m.	<b>Developing solutions</b> - elimination, substitution, engineering controls, administrative controls, training and personal protective equipment
2:30- 2:45 P.M.	<b>BREAK</b>
2:45 - 3:30 p.m.	<b>Case studies and group work:</b> The task will be to determine why certain health effects are being reported to first-aid, investigate the various ergonomic causes and determine some control measures to reduce the health effects.
3:30 - 4:00 p.m.	Discussion of group case studies and wrap-up.



## WHO SHOULD ATTEND

This course is designed for occupational health and safety professionals; managers and supervisors of operating engineers and drivers of heavy equipment and vehicles; occupational health nurses; ergonomists; vocational rehabilitation professionals including occupational/physical therapists, kinesiologists and rehabilitation nurses; others on the health and safety team.

## COURSE INSTRUCTOR

**Judy Village** is a Certified Professional Ergonomist in Canada and the U.S. with over 25 years of experience in applied ergonomics in a variety of industries. She is an Adjunct Professor in the School of Population and Public Health at The University of British Columbia and is a previous member of the Board of Directors for the Canadian College for Certification of Professional Ergonomists. Ms. Village was formerly the Program Leader for the Ergonomics Group at B.C. Research, then an Ergonomist at the WCB. Since 1997, Ms. Village has operated Judy Village & Associates, conducting applied research, ergonomic consultation and development of educational programs. Ms. Village has conducted extensive research on the health effects of whole body vibration, with many publications and scientific presentations to her credit. She has measured and evaluated WBV, and heavy equipment ergonomic concerns, in sectors such as mining, forestry, oil and gas, transportation and railways. Together with Dr. Morrison, they were invited to write a chapter about whole body vibration for the textbook: Biomechanics in Ergonomics (2nd Ed., Shrawan Kumar, editor, 2008). Ms. Village is a long-standing member of the Association of Canada Ergonomists, has served on various CSA and ISO Committees, has over 90 publications and is frequently an invited speaker at conferences and workshops across Canada and the U.S.

## COURSE COORDINATOR

**Lydia Ma, MSc, PhD**  
Director, Continuing Education & Outreach, UBC School of Population & Public Health



## CERTIFICATION MAINTENANCE

Applications for certification maintenance points have been made to the following organizations:

### INDUSTRIAL HYGIENE AND SAFETY:

- Board of Canadian Registered Safety Professionals (BCRSP)
- Canadian Registration Board of Occupational Hygienists (CRBOH)
- Canadian Society of Safety Engineers (CSSE)

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### PUBLIC HEALTH:

- Canadian Institute of Public Health Inspectors (CIPHI)

Information on certification maintenance approval numbers and points will be posted in the UBC SPPH Continuing Education website:

<http://www.spph.ubc.ca/79.htm>



## REGISTRATION INFORMATION

**Course date:** C W t c V Y f ' % ' ž ' & \$ % &

## LOCATION:

UBC C.K. Choi Building for The Institute of Asian Research,  
Conference Room 120  
1855 West Mall  
Vancouver, BC

## COURSE DURATION:

9:00 am – 4:00 pm

## COURSE FEE:

**On or before** C W t c V Y f ' % ' ž ' & \$ % & ..... **\$325**  
**After** C W t c V Y f ' % ' & \$ % &: **\$375**

*Registration fee is HST exempt and includes lunch, refreshment breaks and course materials.*

### PHOTO CREDITS:

#### COVER:

taliesin (morguefile)

Joanna Szycik (dreamstime)

Max Blain (dreamstime)

#### PAGE 3

Max Blain (dreamstime)

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#### PAGE 4

Mark Robbins (stockxchng)

## REGISTER AT:

[www.eplivevents.com/ubcergo2012](http://www.eplivevents.com/ubcergo2012)

## VENUE & ACCOMMODATIONS

A number of lodging options are available on campus. Please contact the course coordinator for further information.

## CANCELLATION AND REFUND POLICY

This policy is in effect once online registration is submitted. Cancellation and delegate substitution must be notified in writing. Refund, less a cancellation fee of CAD75, can be issued up to 10 business days prior to the start of the event (C W t c V Y f ' % ' ž ' & \$ % & 2012). All cancellations received thereafter are non-refundable (sorry, no exceptions). Participant substitutions are permitted with 48-hour notice without additional fee. UBC School of Population & Public Health reserves the right to cancel this course or to substitute instructors as necessary. If the event is cancelled for any reason, UBC assumes liability limited to a refund of the registration fee paid only.

## ACKNOWLEDGEMENT

The UBC SPPH Continuing Education Program would like to acknowledge the BC Federation of Labour for their support in the development of this course.

## FOR COURSE INQUIRIES, PLEASE CONTACT:

**UBC SPPH Continuing Education**

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