

Syllabus

WBV101

Whole-body vibration: Health effects and evaluation in the workplace

September 25th – 28th

Instructor

Dr. Katie Goggins, PhD, CCPE

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centre for research in
occupational safety and health
at Laurentian University

centre de recherche sur la
santé et sécurité au travail
à l'Université Laurentienne



Course Specifications

Course Title	Whole-body vibration: Health effects and evaluation in the workplace.
Code	WBV101
Level	Intermediate
Pre-requisites	No
Course Material	To be provided by instructor
Coordinating Editor	Dr. Katie Goggins (PhD, CCPE)

Course Aims

To provide the learner with an appreciation of the nature of whole-body vibration (WBV) hazards in the workplace and the effects of WBV on a worker. The detailed approach of carrying out a WBV assessment in the workplace and the significance of measured data in relation to the various standards of compliance will also be outlined.

Learning Outcomes

Upon successful completion of this module, the student should be able to:

- Define measures of a vibration signal;
- Describe the consequences to the health and well-being of excess exposure to occupational whole-body vibration;
- Recognize occupations with low, medium, and high whole-body exposure to vibration;
- Compare standards for the evaluation of whole-body vibration;
- Understand the requirements for conducting a whole-body vibration risk assessment;
- Critique components of whole-body vibration reports; and
- Understand current standards and good practice in these fields.

Course Format

Runs as a 4-day, remote, synchronous course (minimum 32 hours including lectures, tutorials, practical demonstration sessions, guided reading, overnight questions, and knowledge test). *There will be a final knowledge test with an allowed time of 2 hours.*

Continuous Improvement



Canadian Certified Professional Ergonomist (CCPE)

- Category 3 – Receiving ergonomics-related training: 32 hours = 16 points

Canadian Registered Safety Professional (CRSP)

- Category A – Continue Education: A4 OHS-related courses, seminars, workshops, conferences, or roundtables: 32 course hours = 3.2 CEUs

Canadian Registered Occupational Hygienist (ROH)

Category 5 – Attendance at Professional Conferences and Educational Courses, Table 1: Measurement and control of physical and biological agents, biological monitoring, ergonomics: 4 full days = 4 points

Course Outline with approximate time allocated (*subject to change*)

Day	Topic	Content	~Time Allocated
1	1	Physics of Vibration	2 hrs
1	2	Human Response to Whole-Body Vibration	3 hrs
1	3	Examples of Whole-Body Vibration Exposure	3 hrs
2	4	Whole-Body Vibration Standards	4 hrs
2	5	Assessment of Whole-Body Vibration Risk	4 hrs
3	6	Whole-Body Vibration Data Analysis	4 hrs
3	7	Whole-Body Vibration Technical Reporting	4 hrs
4	8	Strategies of Controlling Whole-Body Vibration	3 hrs
4	9	Course Review	3 hrs
4	10	Knowledge Test	2 hrs
<i>Total</i>			32 hrs

Note: Reference is made to standards and good practice documentation. This is intended as guidance for students only.

Course Registration and Payment

Registration: Email croshtech@laurentian.ca to register for this course. The minimum students for the course to run will be 5, with a maximum of 15 students.

Price: WBV101 Course (Remote Synchronous): \$2,400 + HST = \$2,712

Learning and Teaching Activities

Learning Time

Scheduled contact hours:	Lectures	16
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(estimated)	Tutorials	8
	Examinations (including preparation)	3
	Guided Independent Study (Includes preparation for scheduled sessions, follow-up work, wider reading or practice, and revision.)	5
Total		32

Detailed Course Content

Topic #	Topic	Day
1	Physics of Vibration	1
	Introduction to Wave Theory Categorization of Vibration Vibration Axes Vibration Magnitude Vibration Frequency Transmissibility Resonance	
2	Human Response to Whole-Body Vibration	1
	Perception Motion Sickness Comfort and Discomfort Physiological Response Pathological Response Psychological Response	
3	Examples of Whole-Body Vibration Exposures	1
	Road Vehicles Off-Road Vehicles Aircrafts Construction Vehicles Mining Vehicles	
4	Whole-Body Vibration Standards	2
	Definitions International Organization for Standardization British Standards Institution	
Topic #	Topic	Day
4	Whole-Body Vibration Standards	2
	Definitions	



International Organization for Standardization
British Standards Institution

5	Assessment of Whole-Body Vibration Risk	2
	Operational Considerations Instrumentation Calibration Frequency Analysis Time History Analysis Observation of Work Practices and Processes Whole-Body Vibration Sampling Techniques S.E.A.T. Evaluation	
6	Whole-Body Vibration Data Analysis	3
	Frequency Weightings Root-Mean-Square (r.m.s.) Peak Acceleration and Crest Factors (CF) Vibration Dose Value (VDV) Calculation of Daily Exposures Acceptable Exposure-Time Thresholds Fast Fourier Transforms (FFTs) Power Spectral Densities (PSDs) Frequency Response (Transfer) Functions Coherence	
7	Whole-Body Vibration Technical Reporting	3
	Outline Required Content Discuss Possible Templates for Reporting Review and Critique Reported Content	
8	Strategies for Controlling Whole-Body Vibration	4
	Application of the Hierarchy of Controls Engineering Controls Specifics Administrative Controls Specifics	
9	Course Review	4
10	Knowledge Test	4

Thank you for learning with CROSH/CRSST.