



Valvetrain Lubrication, Failures, and Validation

Course Overview

Course Information

Course Description

This course provides an understanding of the effects of valvetrain lubrication, tribology, and friction of the various valvetrain components. With this understanding, typical valvetrain failure modes are discussed along with simple valvetrain modeling and testing techniques for component and system validation.

Course Contact Information

Program Director	Instructor(s)	Technical Support
Michael Andrie Program Director UW-Madison 1550 Engineering Dr. 120 Engineering Research Building mandrie@wisc.edu Phone: 608-263-1615	Bruce Dennert President and Principal Engineer CamCom, Inc. Jim McCarthy Chief Engineer for Vehicle Technologies and Innovation Eaton	InterPro Tech Support Dolt Help Desk System Outages

Course Environment

This is an asynchronous self-paced online course. There are recorded presentations/lectures, resources, and quizzes to facilitate learning. All assignments and course interactions will utilize Internet technologies and require active student participation.

Course Goals

At the completion of this course, you will be able to:

1. Describe valvetrain failure modes
2. Address tribology functions in valvetrain design
3. Identify key aspects of a design validation process
4. Use modeling tools to access valvetrain design

Course Requirements

Technical Requirements

For basic technical requirements, see [InterPro - Online Learning - Technical Requirements](#).

You are also encouraged to watch the Canvas Orientation recorded presentation, located in the Welcome module of your course site, to better understand the learning environment and related functionalities.

Canvas User Profile

You are encouraged to complete your Canvas profile page, with as much information as you feel comfortable including. Some helpful references on how to do this are listed below:

- [How do I edit my profile in my user account?](#)
- [How do I select personal pronouns in my user account?](#)
- [How do I set my Canvas notification preferences?](#)

Optional Key Reference Materials

Norton, *Cam Design & Manufacturing Handbook* ISBN: 0-8311-3122-5

Turkish, *Valve Gear Design* ASIN: B0006AR4JO

Van Basshuysen and Schaefer, *Internal Combustion Engine Handbook* ISBN: 0-7680-1139-6

Wang, *Introduction to Engine Valvetrains* ISBN:10 0-7680-1079-9

Course Topics

- Module 1: Valvetrain Failure Modes
- Module 2: Lubrication and Tribology
- Module 3: Valvetrain Testing and Validation
- Module 4: Valvetrain Kinematic and Dynamic Modeling
- Module 5: Roundtable Review of Valvetrain Hardware and Designs

Sequence of Modules

Course participants will advance through the topics in the sequence that they are presented within the course. Each module will be released based on the successful completion of the prior module's quiz.

Course Assessments

Course Completion

In order to earn continuing education credit you must successfully complete all content, to include earning a score of 100% on each of the required quizzes. At the completion of all the modules, you will receive a certificate of participation. Retain a copy of this certificate for your records.

Partial continuing education units will not be awarded.

Expectations

How to Successfully Complete this Course

- Login to the course site regularly
- Be proactive, prepared, and engaged in course activities
- Create a schedule and stay current on course content
- Seek assistance if needed

You should plan to spend approximately five hours actively participating in the course. *Attendance* in this course means logging into the online course site on a regular basis and participating in all required recorded presentations/lectures, reviewing reference materials, and completing quizzes. You are expected to manage your own learning to meet course obligations.

Diversity and Inclusion

Diversity is a source of strength, creativity, and innovation for UW–Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, outreach, and diversity as inextricably linked goals.

The University of Wisconsin–Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background — people who as students, instructors, faculty, and staff serve Wisconsin and the world.

This support also extends to the conscientious use of language and personal pronouns. If interested, see [Pronouns Matter](#) from the Gender and Sexuality Campus Center to learn more and find instructions on how to indicate your preferred name or pronouns within the tools being used for this course.

For additional information, [see Diversity, Equity, and Inclusion](#).