



## COURSE OUTLINE: MCH253 - BEARINGS/SEALS/LUBRI

Prepared: Donovan Kennedy

Approved: Corey Meunier, Chair, Technology and Skilled Trades

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| <b>Course Code: Title</b>   | MCH253: BEARINGS, SEALS AND LUBRICATION   |
| <b>Program Number: Name</b>   | 4039: MECH. ENG. TN-MANUFA<br>4040: MACHINE SHOP<br>5082: MECH.TECH.IND.MAINT.  |
| <b>Department:</b>  | MECHANICAL TECHNIQUES PS  |
| <b>Semesters/Terms:</b>   | 21W, 21S  |
| <b>Course Description:</b>  | This course will deal with various friction and anti-friction type bearings, dynamic and static type seals and Lubrication both oil and grease. The student will learn the different styles of bearings used today including design, working conditions, loading, fits, preparation, installation, failure types and preventative maintenance. The student will learn about the importance of correct seal type, design, application installation and maintenance. The student will learn about lubrication types, properties and various applications.   |
| <b>Total Credits:</b>   | 2   |
| <b>Hours/Week:</b>  | 2   |
| <b>Total Hours:</b>   | 30  |
| <b>Prerequisites:</b>   | There are no pre-requisites for this course.  |
| <b>Corequisites:</b>  | There are no co-requisites for this course.   |
| <b>Substitutes:</b>   | MCH226  |
| <b>Vocational Learning Outcomes (VLO's) addressed in this course:</b> | <p><b>4039 - MECH. ENG. TN-MANUFA</b></p> <p>VLO 3 Comply with current health and safety legislation, as well as organizational practices and procedures.</p> <p>VLO 4 Apply sustainability best practices in workplaces.</p> <p>VLO 5 Use current and emerging technologies to support the implementation of mechanical engineering projects.</p> <p>VLO 9 Manufacture, assemble, maintain and repair mechanical components according to required specifications.</p> <p>VLO 10 Verify the specifications of materials, processes and operations to support the design and production of mechanical components.</p> <p>VLO 11 Contribute to the planning, implementation and evaluation of projects.</p> <p>VLO 12 Develop strategies for ongoing personal and professional development to enhance work performance.</p> <p><b>4040 - MACHINE SHOP</b></p> <p>VLO 3 Comply with current health and safety legislation, as well as organizational practices and procedures.</p> |

Please refer to program web page for a complete listing of program outcomes where applicable.

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2020-2021 academic year.



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- VLO 4 Support sustainability best practices in workplaces.
- VLO 5 Use current and emerging technologies to support the implementation of mechanical and manufacturing projects.
- VLO 8 Perform routine technical measurements accurately using appropriate instruments and equipment.
- VLO 9 Assist in manufacturing, assembling, maintaining and repairing mechanical components according to required specifications.
- VLO 10 Select, use and maintain machinery, tools and equipment for the installation, manufacturing and repair of basic mechanical components.

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- VLO 3 Comply with current health and safety legislation, as well as organizational practices and procedures.
- VLO 4 Support sustainability best practices in workplaces.
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- VLO 8 Perform routine technical measurements accurately using appropriate instruments and equipment.
- VLO 9 Assist in manufacturing, assembling, maintaining and repairing mechanical components according to required specifications.
- VLO 10 Select, use and maintain machinery, tools and equipment for the installation, manufacturing and repair of basic mechanical components.

**Essential Employability Skills (EES) addressed in this course:**

- EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
- EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.
- EES 3 Execute mathematical operations accurately.
- EES 4 Apply a systematic approach to solve problems.
- EES 5 Use a variety of thinking skills to anticipate and solve problems.
- EES 6 Locate, select, organize, and document information using appropriate technology and information systems.
- EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.
- EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
- EES 10 Manage the use of time and other resources to complete projects.
- EES 11 Take responsibility for ones own actions, decisions, and consequences.

**Course Evaluation:**

Passing Grade: 50%, D

A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.

**Other Course Evaluation & Assessment Requirements:**

Grade  
Definition Grade Point Equivalent

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A+ 90 - 100% 4.00  
 A 80 - 89%  
 B 70 - 79% 3.00  
 C 60 - 69% 2.00  
 D 50 - 59% 1.00  
 F (Fail) 49% and below 0.00

CR (Credit) Credit for diploma requirements has been awarded.  
 S Satisfactory achievement in field /clinical placement or non-graded subject area.  
 U Unsatisfactory achievement in field/clinical placement or non-graded subject area.  
 X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.  
 NR Grade not reported to Registrar's office.  
 W Student has withdrawn from the course without academic penalty.

Smart watches, smart phones and similar devices are not allowed during tests or quizzes and must be removed. Smart phones are not acceptable for use as a calculator during a test or quiz.

**Books and Required Resources:**

Millwright Manual by British Columbia  
 Publisher: Queens Printer  
 ISBN: 0-7718-9473-2  
 Safety Boots, Safety Glasses

**Course Outcomes and Learning Objectives:**

| <b>Course Outcome 1</b>  | <b>Learning Objectives for Course Outcome 1</b>  |
|--|--|
| 1. Upon successful completion of this course, the student will be able to identify the various styles and uses of Friction type bearings.: | 1.1 Describe each styles of bearing housing<br>1.2 Define dimensions for housings and bearings<br>1.3 List Friction bearing materials<br>1.4 Identify different housing designs<br>1.5 Describe babbitt bearings<br>1.6 Calculate bearing Clearances<br>1.7 Describe various methods of Thrust control |
| <b>Course Outcome 2</b>  | <b>Learning Objectives for Course Outcome 2</b>  |
| 2. Upon successful completion of this course, the student will be able to identify the various styles of anti-friction type bearings.      | 2.1 Classify Anti-friction bearing components<br>2.2 Classify different types of anti-friction bearings<br>2.3 Describe the load conditions for each style of bearing<br>2.4 Explain the bearing size and classifications  |
| <b>Course Outcome 3</b>  | <b>Learning Objectives for Course Outcome 3</b>  |
| 3. Upon successful completion of this course, the student will be able to Demonstrate installing and removing bearings                     | 3.1 Perform shaft and housing checks<br>3.2 Install bearings on various types of fits<br>3.3 Use different accessories to remove bearings<br>3.4 Install tapered-bore bearings<br>3.5 Calculate and correctly set bearing clearances<br>3.6 Install and remove Pillow blocks of different designs      |
| <b>Course Outcome 4</b>  | <b>Learning Objectives for Course Outcome 4</b>  |
| 4. Upon successful completion of this course,  | 4.1 Understand the importance of keeping bearings clean  |

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|  | the student will be able to Demonstrate the maintenance of all types of Bearings and Housing.  | 4.2 Understand the importance of keeping bearings in good condition<br>4.3 Apply good maintenance practices  |
|  | <b>Course Outcome 5</b>  | <b>Learning Objectives for Course Outcome 5</b>  |
|  | 5. Upon successful completion of this course, the student will be able to Identify various Static Seals and their applications         | 5.1 Understand what a static seal is<br>5.2 Understand what a Gasket is<br>5.3 Understand what an O-Ring is<br>5.4 Explain the different types of Sealants<br>5.5 Demonstrate how to install and remove static seals |
|  | <b>Course Outcome 6</b>  | <b>Learning Objectives for Course Outcome 6</b>  |
|  | 6. Upon successful completion of this course, the student will be able to Identify various Dynamic Seals and their applications        | 6.1 Understand what a dynamic seal is<br>6.2 Identify the various contact Seals<br>6.3 Identify the various clearance Seals<br>6.4 Demonstrate how to install and remove dynamic seals                               |
|  | <b>Course Outcome 7</b>  | <b>Learning Objectives for Course Outcome 7</b>  |
|  | 7. Upon successful completion of this course, the student will Understand Lubrication principles and the properties of Oil and Grease. | 7.1 Understand the properties of oil<br>7.2 Understand the properties of grease<br>7.3 Understand oil lubrication<br>7.4 Understand grease lubrication<br>7.5 Demonstrate the safe handling of lubricants            |

**Evaluation Process and Grading System:**

| Evaluation Type            | Evaluation Weight |
|----------------------------|-------------------|
| Assignments                | 40%               |
| Attendance & Participation | 10%               |
| Tests                      | 50%               |

**Date:**

September 2, 2020

**Addendum:**

Please refer to the course outline addendum on the Learning Management System for further information.

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