

I. COURSE DESCRIPTION:

CICE students, with assistance from a Learning Specialist, will acquire basic knowledge in regard to selecting, installing and maintaining friction/plain and rolling element bearings and static and dynamic seals. They will learn to assist in the interpretation of ISO charts and bearing catalogues. CICE students will also learn about bearing lubricants and their proper application.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the CICE student, with the assistance of a Learning Specialist will demonstrate a basic ability to:

1. *Identify the various styles and uses of Friction type bearings.*Potential Elements of the Performance:

- Describe each styles of bearing housing
- Define dimensions for housings and bearings
- List Friction bearing materials
- Identify different housing designs
- Describe babbitt bearings
- Calculate bearing Clearances
- Describe various methods of Thrust control

2. *Identify the various styles of anti-friction type bearings.*Potential Elements of the Performance:

- Classify Anti-friction bearing components
- Classify different types of anti-friction bearings
- Describe the load conditions for each style of bearing
- Explain the bearing size and classifications

3. *Demonstrate installing and removing bearings.*Potential Elements of the Performance:

- Perform shaft and housing checks
- Install bearings on various types of fits
- Use different accessories to remove bearings
- Install tapered-bore bearings
- Calculate and correctly set bearing clearances
- Install and remove Pillow blocks of different designs

4. *Demonstrate the maintenance of all types of Bearings and Housing.*

Potential Elements of the Performance:

- Understand the importance of keeping bearings clean
- Understand the importance of keeping bearings in good condition
- Apply good maintenance practices

5. *Identify various Static Seals and their applications.*

Potential Elements of the Performance:

- Understand what a static seal is
- Understand what a Gasket is
- Understand what an O-Ring is
- Explain the different types of Sealants
- Demonstrate how to install and remove static seals

6. *Identify various Dynamic Seals and their applications.*

Potential Elements of the Performance:

- Understand what a dynamic seal is
- Identify the various contact Seals
- Identify the various clearance Seals
- Demonstrate how to install and remove dynamic seals

7. *Understand Lubrication principles and the properties of Oil and Grease.*

Potential Elements of the Performance:

- Understand the properties of oil
- Understand the properties of grease
- Understand oil lubrication
- Understand grease lubrication

1. FRICTION BEARINGS
2. ANTI-FRICTION BEARINGS
3. INSTALLATION AND REMOVAL OF BEARINGS
4. MAINTENANCE OF BEARINGS
5. STATIC SEALS
6. DYNAMIC SEALS

7. LUBRICATION

- Demonstrate the safe handling of lubricants

III. TOPICS:

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

**Millwright Manual/ Industrial Trades Handbook
Keyed lock, Safety boots, Safety glasses.**

V. EVALUATION PROCESS/GRADING SYSTEM:

- Attendance 15% (12/15) **see special notes**
- Assignments 30%
- Tests 55%

The following semester grades will be assigned to students:

| Grade | Definition | <i>Grade Point Equivalent</i> |
|--------------|--|-----------------------------------|
| A+ | 90 – 100% | |
| A | 80 – 89% | 4.00 |
| 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 | |

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has

exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

VI. SPECIAL NOTES:

Attendance:

A student who attends less than 80%(12) classes will receive a zero(0) for attendance

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers will not be granted admission to the room.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.

Addendum:

Further modifications may be required as needed as the semester progresses based on individual student(s) abilities and must be discussed with and agreed upon by the instructor.

CICE Modifications:**Preparation and Participation**

1. A Learning Specialist will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Learning Specialist may not attend all classes with the student(s), support will always be available. When the Learning Specialist does attend classes he/she will remain as inconspicuous as possible.

A. Tests may be modified in the following ways:

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

B. Tests will be written in CICE office with assistance from a Learning Specialist.***The Learning Specialist may:***

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

C. Assignments may be modified in the following ways:

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

The Learning Specialist may:

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional time to process information
5. Formally summarize articles and assigned readings to isolate main points for the student
6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

D. Evaluation:

Is reflective of modified learning outcomes.