

**UNIVERSITY OF MANITOBA
DEPARTMENT OF BIOSYSTEMS ENGINEERING**

COURSE OUTLINE

BIOE 0680 SHOP METHODS

INSTRUCTOR

J.D. Philp
A208 Ag. Eng. Bldg.
Ph: 474-7965

OBJECTIVE

To develop a working knowledge of machine tools and machining procedures, and to develop a thorough understanding of the use of precision measurement instruments.

LECTURES

Three hours of lectures per week in one term.

1. Introduction
 - 1.1 Parts of the lathe and their function
 - 1.2 Tool holders and cutting tools
2. Attachments for Holding Work on the Lathe
 - 2.1 Chucks, face plates, jigs
3. Lathe Operations
 - 3.1 Centre drilling
 - 3.2 Turning speeds, feeds, depth
4. Limits and Tolerances
5. Tapers
6. Drills and Drilling
 - 6.1 Drilling machines
 - 6.2 Speeds and feed rates
 - 6.3 Drill material
 - 6.4 Drill bit configuration and grinding
7. Threads and Threading
 - 7.1 Profiles and specifications of thread standards
 - 7.2 I.S.O. standards
 - 7.3 Lathe threading
 - 7.4 Taps and dies
 - 7.5 Thread production
8. Grinding Machines and Grinding Wheels

- 8.1 Types and functions of machines
- 8.2 Designations and specifications of grinding wheels

- 9. Measurement
 - 9.1 Micrometer
 - 9.2 Vernier calipers
 - 9.3 Dial gauges
 - 9.4 Surface gauges
 - 9.5 Steel rules

- 10. Metal Cutting
 - 10.1 Hand hacksaws
 - 10.2 Power hacksaws
 - 10.3 Bandsaws
 - 10.4 Cut-off wheels
 - 10.5 Circular saws

- 11. Milling Machine

- 12. Shaper

- 13. Finishing Methods and Measurement

LABORATORIES

One laboratory period per week.

The laboratory project consists of the construction of a mandrel.

Instructor will be available for consultation on Mondays and Fridays from 8:30 to 10:30 am.

EVALUATION

50% on written final examination - Questions on the final may be selected from any of the material presented in the course.

15% on written term test on Friday, February 6, 2009

10% on measuring instrument test on Monday, March 23, 2009

25% on laboratory project. - The laboratory project must be completed to obtain credit.

REFERENCES

- 1. Krar, S.J. 1987. Technology of machine tools, 3rd edition. McGraw-Hill Ryerson. Call #AGRIC TJ 1185.K668 1987.