MCHN 2238: Milling Machine IV

Course Term: Fall, 2012

Semester Hours: 2

Location: Alice Campus, Room 165 and Machine Lab

Prerequisite: MCHN 2230 Intermediate Milling Machine III

Instructor: Rick Pearce
Phone: (361) 664-2981 ext. 3053
Email: pearcer@coastalbend.edu

Textbook:

MACHINING FUNDAMENTALS, John R. Walker,
ISBN 9781590702499 (Required)

MACHINING FUNDAMENTALS WORKBOOK, John R. Walker,
ISBN 9781590702505 (Required)

PRINT READING FOR INDUSTRY, Walter C. Brown and Ryan K. Brown
ISBN 9781605253084 (Required)

Supplies:
Safety glasses, hearing protection, tooling and material for lab projects will be provided, subject to policies outlined in class.

Course Description:
Milling Machine IV uses the knowledge gained in the previous mill classes and teaches students additional skills to prepare them for a successful career in a manufacturing environment. Emphasis will be placed on learning proper terminology and nomenclature, operation, safety, holding close tolerances, part layout and bench work, machine mathematics, theory, print reading, shop safety, housekeeping and preventative maintenance.

Course Learning Outcomes:
Students will be able to identify various milling machine components, determine optimum conditions and tooling for different materials, know safety procedures, identify types of milling machines and machine accessories, use formulas to calculate feeds and speeds, set up advanced milling machine operations, perform metal removing and shaping operations such as facing, drilling, grooving, radii, angles and precision boring, as well as machine maintenance.
Supplementary Materials: Audio visual aids (DVD, video tape, Power Point presentations, etc.)
Handout materials

Performance Objectives: Following oral and written instructions, and using industry accepted safe practices, the student will be able to perform the following tasks in the classroom and machine lab. The knowledge achieved will be evidenced by satisfactorily performing laboratory demonstrations, completion of assignment sheets, and by scoring the college minimum satisfactory grade.

1. Safety
   A. Student will be expected to identify and use properly all Personal Protective Equipment (PPE) required by OSHA or other governing entities and routinely used in commercial machine shops.
   B. Students will be able to identify and take corrective action when they observe an unsafe condition or practice.
   C. Students will maintain a clean and safe work environment at all times, and will follow accepted safety procedures at all times.

2. Print reading and machine shop mathematics.
   A. Students will be able to identify various drawing elements and describe the purpose for each element.
   B. Students will be able to interpret a 2 dimensional drawing and visualize and / or create a finished machined part from the drawing by utilizing standard process planning methods.
   C. Students will be able to use dimensional information given on a print and convert between inch and metric or between fractional and decimal.
   D. Students will be able to use dimensional information given on a print and be able to calculate additional information necessary to complete the finished part to print specifications. Example: Determine X and Y coordinates when given a statement such as “5 holes equally spaced on a 3 inch bolt circle”.

3. Analyze the Bill of Materials (BOM) on a drawing or create one if necessary and procure the appropriate items.

4. Identify different materials used in manufacturing.
   A. Students will be able to evaluate specific properties of materials to determine if it is ferrous or non-ferrous, or metal or non-metal.
   B. Students will be able to identify and select the appropriate material for specific applications based on information provided on the print.

5. Identify and use appropriate measuring tools in the correct manner, based on size and material of the part and tolerance to be held.

6. Identify the major parts of the milling machine.

7. Operate the milling machine safely and accurately.

8. Use hand tools safely and effectively.

9. Use correct procedure to layout rough material on the bench to prepare for machining.
Teaching Methods:

1. Lecture on textbook.
2. Lecture on “Coastal Bend College” safety handbook.
3. Power Point presentations and videos.
5. Overhead transparencies.
6. Individual and group discussions in the lab.
7. Team corroboration on lab projects.

Evaluation Methods:

1. Attendance. 10%
2. Lab tests and lab performance. (Projects) 30%
3. Safety. 10%
4. Participation in classroom activities and homework. 25%
5. Written exams, quizzes. 25%

Attendance Policy:

Students must attempt to attend all classes. Excessive absenteeism will have a detrimental effect on the student’s grade. Emergencies happen, please contact the instructor as soon as possible when you must miss a class. The same criteria an employer uses to evaluate absences will be used here, including dismissal from the class. We keep track of how many times your grandmother has died.

Classroom and Lab Conduct:

Safety. Horseplay and other inappropriate behavior will not be tolerated. Deliberate unsafe acts such as horseplay, fighting, practical jokes and any other non professional behavior may result in immediate dismissal from the class and a failing grade will result.

Appropriate Dress. Students will be expected to arrive ready to work in an industrial environment. Students must wear closed shoes, long trousers and short sleeves when working in the shop. Necklaces, loose bracelets watches or any other body decoration that may get caught in rotating machinery must be removed. Any student wearing shorts, open shoes or flip-flops, or any other clothing deemed unsafe will not be allowed in the machine lab and they will be marked absent for the period.

Tobacco. The use of any form of tobacco, including smoking or smokeless will not be allowed in either the classroom or the shop, or within 20 feet of any entrance to the building.

Cell phones, PDA or any other device that distracts student attention must be set to vibrate or turned off. If you truly have an emergency, please excuse yourself from the classroom, or, if you are in the lab, stop your machine safely and move to an area of the room, or preferably to the hallway or outside the building so you do not distract other students. Use of cell phones at a machine or any other unsafe action will not be tolerated.
Refreshments. Refreshments can be brought into the lab area as long as the containers are disposed of by the end of class. Partially filled containers left in the lab will result in a ban of all refreshments.

Integrity. This word is used to describe the vast majority of people. It will never be used to define someone that does not respect the rights, feelings and property of others. Make sure that all of the assignments and tests that you complete are from your own labors.

Syllabus Statement on Disabilities

(September 2009)

Students with special needs, including physical and learning disabilities, who wish to request accommodations in this class, should contact the Counseling Office as soon as possible to make arrangements. In accordance with federal law, a student requesting accommodations must provide documentation of disability to the Special Needs Counselor. For more information, please go by the Counseling Office, or contact:

Beeville Counselor, Eddie Rojas, edrojas@coastalbend.edu (361) 354-2731 or 2304
Alice Counselor, Dee Berthold, deedee@coastalbend.edu (361) 664-2981 Ext.3025
Kingsville Counselor, Pete Trevino, ptrevino@coastalbend.edu (361) 591-1615 Ext.4077
Pleasanton Counselor, Lauren Denver, ldenver@coastalbend.edu (830) 569-4222 Ext. 1203

Course Outline:

I. Introduction to Safety in the Machine Trades
II. Tour of Machine Shop
III. Basic Measuring Tools
IV. Basic Machine Shop Mathematics
V. Basic Machine Shop Print Reading
VI. Tool Sharpening
VII. Milling Machine Safety and Operation
VIII. Job Planning
IX. Part Layout
X. Additional Assignments at the Instructors Discretion
COASTAL BEND COLLEGE
INDUSTRIAL TECHNOLOGY
MILLING MACHINE IV COMPETENCY PROFILE

STUDENT: ___________________________ COURSE: MCHN 2238

INSTRUCTOR: ___Rick Pearce_________ SEMESTER / YEAR: FALL / 2012

RATING SCALE:

4 Skilled: Can work independently with no supervision.
3 Moderately Skilled: Can perform assignment completely with limited supervision.
2 Marginally Skilled: Requires frequent instruction and close supervision.
1 No Exposure: No experience or knowledge in this area.

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<td>Wears appropriate PPE at all times</td>
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<td>Demonstrates a desire to always work in a safe manner without prompting</td>
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<td>Follows established safety procedures</td>
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<td>Uses engineering drawing and appropriate layout tools to prepare a rough part for machining</td>
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<td>Prepares milling machine, clamps part, assembles tooling in timely manner</td>
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<td>Determines correct feeds and speeds and adjusts milling machine accordingly</td>
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<td>Machines flat steel to a specified thickness, holding a tolerance of plus or minus .005 inches and milling a profile that includes an angle and a radius, both with a tolerance of plus or minus .005 inches</td>
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<td>Machines angled and radius slots in flat steel to a specified width, length and depth, holding a tolerance of plus or minus .005 inches</td>
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<td>Machines an angled surface to specified dimensions, holding a specified tolerance</td>
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<td>Bore 4 precision holes, maintaining tolerances of plus or minus .005 inches on both location and size</td>
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<td>Prepares finished part for inspection and uses the appropriate measuring device to compare the finished part to engineering drawing</td>
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<td>Demonstrates safe practice by periodically cleaning the work area and thoroughly cleans the work area and machine at the end of the class period.</td>
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