SYLLABUS

DATE OF LAST REVIEW: 02/2013

CIP CODE: 48.0501

SEMESTER: Departmental Syllabus

COURSE TITLE: Machining III

COURSE NUMBER: MACH0201

CREDIT HOURS: 3

INSTRUCTOR: Departmental Syllabus

OFFICE LOCATION: Departmental Syllabus

OFFICE HOURS: Departmental Syllabus

TELEPHONE: Departmental Syllabus

PREREQUISITES: MACH0103 Bench Work, MACH0105 Quality Control and Inspection, MACH0107 Machine Tool Processes, MACH0108 Machining Fundamentals I, MACH0109 Machining Fundamentals II and Fundamentals of Mathematics w/ a grade of "C" or higher or appropriate score on the Math assessment test.

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, http://www.kckcc.bookstore.com, for the required texts for your particular class.

COURSE DESCRIPTION:
This course will introduce the learner with the advanced operations and to properly identify, set-up, and operate metal turning, milling equipment and safely. This course will emphasize hands on approach as well as classroom activities to familiarize the student with the process to complete job task analysis. Materials covered in this course will enhance the procedures learned in MACH 0108, 0109. This course will also cover common mathematical formulas that will be implemented in to the curriculum to achieve expected learner outcomes.

METHOD OF INSTRUCTION: A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.
COURSE OUTLINE:

I. General Applications:
   A. Analyze special tooling
   B. Define special holders
   C. Determines correct tool holding methods
   D. Plan tooling lists and selects proper tooling
   E. Plan sequence of operations
   F. Equipment adjustments to maintain accuracy
   G. Identifies backlash and corrective actions
   H. Proper cleanliness of shop and related equipment
   I. Equipment safety
   J. Recordkeeping
   K. Job planning
   L. Identifies backlash and corrective actions

II. Lathe operations:
   A. Adjust equipment for speeds and feeds
   B. Machines parts to proper tolerances
   C. Set-up equipment for operations
   D. Turn parts within tolerance ranges
   E. Record maintenance performed on equipment
   F. Machine maintenance
   G. Performs PMI on engine lathes
   H. Identify types and classification for fits
   I. Calculation of formulas for common mathematic problems used in lathe operations

III. Vertical milling machine operations:
   A. Adjust equipment for speeds and feeds
   B. Machine parts to proper tolerances
   C. Sets-up equipment for operations
   D. Mill parts within tolerance range
   E. Machine maintenance
   F. Perform PMI on vertical mills
   G. Record maintenance performed on equipment
   H. Identify types and classification for fits
   I. Calculation of formulas for common mathematic problems used in milling operations

EXPECTED LEARNER OUTCOMES:
A. The student will be able to utilize general applications
B. The student will be able to perform engine lathe operations
C. The student will be able to perform vertical milling machine operations
D. The student will be able to calculate mathematical formulas

COURSE COMPETENCIES:
Upon completion of this course:
The student will be able to utilize general applications

1. The student will be able to conduct a job hazard (JHA) for lathes and mills.
2. The student will be able to recite safety rules for lathe and mills.
3. The student will be able to recite nomenclature of parts for lathe and mills.
4. The student will be able to create job analysis for production of parts from blueprints.
5. The student will be able to create job analysis for one off replication of parts.
6. The student will be able to maintain logs for tooling used.
7. The student will be able to analyze blueprints to select correct tooling and layout.
8. The student will be able to create blueprint for part replication.
9. The student will be able to select and apply cutting fluids.
10. The student will be able to record preventative maintenance log.
11. The student will be able to apply precautions needed to minimize shop hazards with equipment

The student will be able to perform engine lathe operations

12. The student will be able to identify part holding chucks, collets, and centers.
13. The student will be able to indicate parts in 4 jaw chuck.
14. The student will be able to indicate parts on face plate.
15. The student will be able to adjust equipment for speed and feeds for different materials.
16. The student will be able to take affirmative action to correct cutting conditions.
17. The student will be able to apply cutting fluids.
18. The student will be able to check accuracy of equipment.
19. The student will be able to adjust equipment to maintain accuracy.
20. The student will be able to demonstrate knowledge of the uses of dro’s.
21. The student will be able to identify graduations marked on machine dials.
22. The student will be able to adhere to safety of equipment.
23. The student will be able to create job procedure list for sequence of operations.
24. The student will be able to set-up and select tooling.
25. The student will be able to set-up tool holders and tool blocks.
26. The student will be able to cut taper utilizing tail stock offset method. (OD)
27. The student will be able to cut taper utilizing taper attachment method. (ID)
28. The student will be able to perform parting operation.
29. The student will be able to perform grooving operations (ID and OD).
30. The student will be able to perform production job planning sheet.
31. The student will be able to indicate parts utilizing 4-jaw chuck.
32. The student will be able to machine parts between centers.
33. The student will be able to cut internal and external single point 60* threads. (mm and inch)
34. The student will be able to cut internal and external single point 29* threads.
35. The student will be able to machine parts to specified size.
36. The student will be able to perform machine maintenance.
37. The student will be able to record maintenance performed on equipment.

The student will be able to perform vertical milling machine operations

38. The student will be able to identify part holding devices for milling procedures.
39. The student will be able to adjust equipment for speed and feeds for different materials.
40. The student will be able to describe chatter and possible remedies.
41. The student will be able to correct common milling problems.
42. The student will be able to check accuracy of equipment.
43. The student will be able to adjust equipment to maintain accuracy.
44. The student will be able to demonstrate knowledge of the uses of dro’s.
45. The student will be able to identify graduations marked on machine dials.
46. The student will be able to adhere to safety of equipment.
47. The student will be able to create job procedure list for sequence of operations.
48. The student will be able to apply cutting fluids.
49. The student will be able to set-up and select tooling.
50. The student will be able to set-up tool holders and collets.
51. The student will be able to demonstrate knowledge of climb milling vs. conventional milling operations
52. The student will be able to demonstrate the use of parallels.
53. The student will be able to machine parts to specified size.
54. The student will be able to perform machine maintenance.
55. The student will be able to machine parts to tolerance with indexing head procedures.
56. The student will be able to machine parts to tolerance with rotary table.
57. The student will be able to tap holes in parts on vertical mill.
58. The student will be able to bore hole to size with adjustable boring head.
59. The student will be able to perform pocketing operations.
60. The student will be able to record maintenance performed on equipment.

The student will be able to calculate mathematical formulas

61. The student will be able to identify fits and calculate parts for final machining.
62. The student will be able to calculate feed and speeds with chip load per tooth.
63. The student will be able to calculate trigonometric functions.
64. The student will be able to convert metric to American and back to mm.
65. The student will be able to calculate depth of cuts.
66. The student will be able to calculate compound rest angles.
67. The student will be able to calculate tailstock for taper turning operations.
68. The student will be able to calculate direct and indirect indexing solutions.
69. The student will be able to calculate hole locations for patterning.
70. The student will be able to calculate RPM, SFPM.

ASSESSMENT OF LEARNER OUTCOMES:
Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.

SPECIAL NOTES:

This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.
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