SYLLABUS

DATE OF LAST REVIEW: 02/2013

CIP CODE: 48.0501

SEMESTER: Departmental Syllabus

COURSE TITLE: CAD/CAM I

COURSE NUMBER: MACH0204

CREDIT HOURS: 4

INSTRUCTOR: Departmental Syllabus

OFFICE LOCATION: Departmental Syllabus

OFFICE HOURS: Departmental Syllabus

TELEPHONE: Departmental Syllabus

PREREQUISITES: Core curriculum Certificate A or documentation of NIMS, or successfully passing a machining credentialing testing method per instructor.

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:
The learner will be introduced to computer fundamentals by creating part files, and interpreting part starting procedures. Several software’s will be introduced and taught (Master Cam, Gibbs, and Feature Cam) Students will make a choice of which or all will be mastered.

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. Introduction
   B. Part set-up
   C. Tool Creation
D. General machining information
E. Plans sequence of operations
F. Process information
G. Operations
H. Rotary machining
I. Cut part rendering
J. Post processing
K. Communications
L. Equipment safety

II. Introduction
A. The system requirements
B. Prompting
C. Text
D. Technical support

III. Part set-up
A. Documents and controls
B. Top sections of the document controls
C. Bottom sections of the document controls
D. Custom stock
E. Custom stock with a hole

IV. Tool creation
A. Tool creation overview
B. Tool creation dialog
C. Tool types
D. Tool list summary
E. Tool offsets cutter comp

V. General marching information
A. Machining overview
B. Creating an operation
C. Multiple process programming
D. Modifying an operation
E. Machining palette
F. Material data base

VI. Processes information
A. Process dialogs
B. Hole process
C. Hole bore tab
D. Hole process pre mill turn tab
E. Holes process rotate tab
F. Roughing process- offset
G. Zig zag roughing process
H. Roughing process surface tabs
I. Contouring process
J. Threading
K. Material only
L. Rotate tab
M. Machining markers
N. Pre-defined process groups

VII. Operations
A. Clearance markers
B. Entry exit moves
C. Entry exit moves at tool change
D. Intra-operation moves
E. Boss top machining
F. Machining air
G. 2 ½ axis surfacing
H. Patterns
I. Engraving
J. Operation titles
K. Operation summaries
L. Printing tool paths

VIII. Rotary machining
A. Rotary milling wrapping
B. Flat vs. radial geometry

IX. Cut part rendering
A. Cut part rendering overview
B. Cut part rendering palette
C. Printing the cut part rendering image

X. Post processing
A. Post processing overview
B. Post processor dialog
C. Mill post labeling definitions

XI. Communications
A. Protocols
B. Communicating with a CNC machine

EXPECTED LEARNER OUTCOMES:
A. The student will be able to set up part stock.
B. The student will be able to create tools lists.
C. The student will be able to understand general machining set-ups.
D. The student will be able to plan sequence of operations.
E. The student will be able to create operations lists.
F. The student will be able to render parts.
G. The student will be able to locate posts for equipment.
H. The student will be able to set-up communication with equipment.
I. The student will be able to understand system requirements.
J. The student will be able to create text.
K. The student will be able to create custom stock sizes.
L. The student will be able to create tools.
M. The student will be able to understand tool cutter comp.
N. The student will be able to relate to machining overviews.
O. The student will be able to create operations.
The student will be able to locate material data bases.
The student will be able to understand process dialogs.
The student will be able to identify tool types.
The student will be able to create tool list summary.
The student will be able to create an operation for machining.
The student will be able to create process to machine parts.
The student will be able to understand machining markers.
The student will be able to create clearance in machining process.
The student will be able to create patterns.
The student will be able to locate operation summaries.
The student will be able to print information.
The student will be able to create rotary moves.
The student will be able to view parts prior to machining.
The student will be able to post process parts to be machine.
The student will be able to communicate with equipment.

**COURSE COMPETENCIES:**
Upon completion of this course:

*The student will be able to set up part stock.*
1. The student will be able to create part stock set-ups.
2. The student will be able to understand tool selection.
3. The student will be able to have concepts of general machining operations.
4. The student will be able to plan sequence of operations.
5. The student will be able to set up software to create rotary programs.
6. The student will be able to operate equipment safely.

*The student will be able to create tools lists.*
7. The student will be able to select tools by size shape.
8. The student will be able to create tool lists.
9. The student will be able to give an overview of tools used.

*The student will be able to understand general machining set-ups.*
10. The student will be able to create a safe set-up for machining.
11. The student will be able to create multiple operation lists.
12. The student will be able to modify an operation.
13. The student will be able to understand a machining palette.
14. The student will be able to access the material data base.

*The student will be able to plan sequence of operations.*
15. The student will be able to determine machining order of operations.

*The student will be able to create operations lists.*
16. The student will be able to create hole operations.
17. The student will be able to create bore operations.
The student will be able to offset roughing process.

The student will be able to create zigzag face milling operations.

The student will be able to create contour machining methods.

The student will be able to create pocketing methods.

The student will be able to create threads.

The student will be able to create rotating tabs.

The student will be able to take affirmative action to correct cutting conditions.

The student will be able to render parts.

The student will be able to cut part render parts.

The student will be able to modify rendered order of sequence.

The student will be able to locate posts for equipment.

The student will be able to identify post processors.

The student will be able to set-up communication with equipment.

The student will be able to identify communication links to equipment.

The student will be able to send program to equipment.

The student will be able to receive programs from equipment.

The student will be able to operate equipment safely.

The student will be able to adhere to safety operations of equipment.

The student will be able to understand system requirements.

The student will be able to locate the system requirements to run software.

The student will be able to check systems configuration.

The student will be able to create text.

The student will be able to locate shapes in software.

The student will be able to engrave their name with selected text for machining.

The student will be able to create custom stock sizes.

The student will be able to create odd shaped stock sizes.

The student will be able to establish part zero on odd shaped stock sizes.

The student will be able to create no machining boundaries on stock.

The student will be able to create tools.

The student will be able to draw special tool configurations.

The student will be able to import special tools in to the tool bank.

The student will be able to understand tool cutter comp.

The student will be able to describe the effects of cutter comp vs. no cutter comp.

The student will be able to relate to machining overviews.

The student will be able to analyze machining times.

The student will be able to determine pre defined process groups.
The student will be able to create operations.
44. The student will be able to establish machining control markers.
45. The student will be able to create entry exit moves.
46. The student will be able to create exit moves at tool changes.
47. The student will be able to introduce operation moves.
48. The student will be able to optimizing air movements.
49. The student will be able to machine 2 ½ axis parts.
50. The student will be able to create patterns.

The student will be able to locate material data base.
51. The student will be able to access the material feed and speed data base.

The student will be able to create process to machine parts
52. The student will be able to create sub routines.
53. The student will be able to identify special machining boundaries.
54. The student will be able to establish multiple part zeros.
55. The student will be able to change sequence of operations.

The student will be able to identify tool types.
56. The student will be able to select tools to optimize cutting effects.
57. The student will be able to select correct tool holders.

The student will be able to create tool list summary.
58. The student will be able to list tooling for part production.
59. The student will be able to create cost list per part for production.

The student will be able to create an operation for machining.
60. The student will be able to produce parts from prints.
61. The student will be able to plan optimization for multiple part producing.

The student will be able to create process to machine parts.
62. The student will be able to analyze parts for accuracy.
63. The student will be able to determine cycle times for part production.

The student will be able to understand machining markers.
64. The student will be able to create start stop points for tool paths.
65. The student will be able to select features for matching markers.

The student will be able to create clearance in machining process.
66. The student will be able to create clearance planes for tool clearance.
67. The student will be able to create tool clearance for rapid tool movements and tool changes.

The student will be able to create patterns.
68. The student will be able to create off set hole patterns.
69. The student will be able to create aligned hole patterning.
70. The student will be able to duplicated and mirror patterns.

*The student will be able to locate operation summaries.*

71. The student will be able to print summary time management reports.

*The student will be able to print information.*

72. The student will be able to access local printer’s plotters to produce prints.

*The student will be able to create rotary moves.*

73. The student will be able to create programs using A axis routines.
74. The student will be able to establish machine setup for A axis.

*The student will be able to view parts prior to machining.*

75. The student will be able to cut part render parts prior to machining.
76. The student will be able to determine if part program is clean.

*The student will be able to post process parts to be machine.*

77. The student will be able to send communication links to equipment.
78. The student will be able to format programs to machine language.

*The student will be able to communicate with equipment.*

79. The student will be able to send clean program to equipment.

**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.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

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