

Machine Tool Technology

Program Design Summary

Program Information

Organization	Washburn Institute of Technology
Program Number	48.0501
Instructional Level	Certificate
Instructional Area	Machine Tool
Original Developer(s)	Dale Schafer
Last Revision Date	1/9/2009

Target Population

Grades 11 to Postsecondary

Description

This program prepares individuals to apply technical knowledge and skills to plan, manufacture, assemble, test, and repair parts, mechanisms, and machines. Instruction includes technical information in blueprint reading, sketching, angles, tapers, gearing, and precision measuring; it also includes training in the operation of machine tools--engine lathe, milling machine, surface grinder, drill press, computerized numerical control milling machines, and computerized numerical control lathe.

Indirect Measures

1. Rating on competency profile
2. Key Train scores to raise one level above the entrance score optional
3. Must pass the program safety test

Career/Job Titles

Title

1. Maintenance machinist
2. Machine Operator
3. Machine set up person
4. Gunsmith
5. Tool and Die Maker
6. All around machinist
7. Instrument maker

Entry Requirements

1. Prospective students must pass the general entrance assessment, WorkKey, at a Level 4 in Applied Math and Reading for Information.

Evaluation Summary

Grading Rationale

Grading is based on the quality of shop assignments, class participation and attitude, test and quiz scores, print reading scores, and textbook assignments.

Students earning:

90% or higher will receive an "A"

89% to 80% will receive a "B"

79% to 70% will receive a "C"

69% to 60% will receive a "D"

Less than 60% will receive an "F"

The minimum acceptable passing required is "C"

ADA Notification Statement

Disability Services:

The Special Support Services (SSS) Office is responsible for assisting in arranging accommodations and for identifying resources at KATS for persons with disabilities. Qualified students with disabilities MUST register and provide documentation with the office to be eligible for services. New requests for accommodations should be submitted two months or more prior to the date services should begin; however, contact the SSS Office as soon as a need may arise. Depending on the accommodation request, four to eight weeks lead time may be needed for timely and effective provision of services. SSS coordinates and assist in arranging services it deems appropriate for eligible students on a case-by-case basis.

If you are a student with a disability that may substantially limit your ability to participate in this class and believe you will need accommodations, it is your responsibility to contact:

Who: Special Support Services Coordinator

Location: Career Resource Center, Room 300

Phone: 785-228-6356)

E-Mail: mnelson@kats.tec.ks.us

Student may voluntarily identify themselves to the instructor for a referral to the Special Support Services Coordinator.

Attendance

Importance of class attendance: Class attendance contributes significantly to academic success.

Students who attend classes regularly tend to earn higher grades and have higher passing rates in courses. Excessive absences may jeopardize your grades or even your ability to continue in this course.

Class absences: If you are absent from class for any reason you are responsible for all missed work and for contacting the instructor promptly.

Make-up policy

The make-up policy is for excused and school related absents only

One page paper per hour of make-up, (not including title or references)

1" margins all around

12 point font

Double spaced

Times new roman font

One internet reference [including the http address]

One text reference

The subject will be assigned

One week will be allowed to complete a paper

If the paper is not to the prescribed format it will not be accepted

Program Outcomes

- A. Apply technical knowledge in hands-on experience for today's and tomorrow's job market.
- B. Provide an overview of machining processes

Core Abilities

- A.
- B. Communicate effectively.
- C. Integrate technology.
- D. Learn effectively - use academics effectively.
- E. Demonstrate cooperative/teamwork skills
- F. Apply Safety
- G. Think critically and creatively
- H. Demonstrate responsible work ethics

Course Configuration						
Semester	Course #	Course Title	Credits	Contact Hrs	Category	Req?
	MTT100	Safety	1	15	Core Course	Yes
	MTT110	Print Reading/Math I	3	60	Core Course	Yes
	MTT115	Print Reading/ Math II	1	15	Core Course	Yes
	MTT210	Print Reading/Math III	1	15	Core Course	Yes
	MTT215	Print Reading/Math IV	2	45	Core Course	Yes
	MTT120	Lathe/Mill/Grind I	8	195	Core Course	Yes
	MTT125	Lathe/Mill/Grind II	8	210	Core Course	Yes
	MTT220	Lathe/Mill/Grind III	7	165	Core Course	Yes
	MTT225	Lathe/Mill/Grind IV	9	210	Core Course	Yes
	MTT230	Ben/Saw/Drill	4	90	Core Course	Yes
	MTT130	Inspection & QA	2	30	Core Course	Yes
	MTT150	Workplace skills I	1	15	Required	Yes
	MTT250	Workplace skills II	1	15	Required	Yes
	MTT260	OJT	3	135	Elective	No

Program Course Detail

Course A -- Safety

Course Number	MTT100
Credits	1
Contact Hours	15
Total Hours	15
Category	Core Course
Required	Yes

Course Description

This unit will cover safety of all aspects of the shop. The methods of instruction will utilize textbook instruction, lecture, and shop demonstrations. Safety is an ongoing education and will be taught

on all machines. No student will be allowed to operate or be in the area of operating machines until that student has successfully completed the initial safety test. Safety will be reintroduced into the program as each chapter of the text is covered. Students are expected to observe and comply with all safety rules and regulations

Linked Program Outcomes

- A. Apply technical knowledge in hands-on experience for today's and tomorrow's job market.
- B. Provide an overview of machining processes

Course B -- Print Reading/Math I

Course Number MTT110

Credits 3

Contact Hours 60

Total Hours 60

Category Core Course

Required Yes

Course Description Print reading will be taught using the work book, Machine Trades Print Reading. Thirty to forty five minutes of every Tuesday and Thursday will allowed for working in the work book. The instructor will find more challenging exercises for the students that accelerate and successfully complete the work book before the completion of the course. Print reading will also be used in a practical manner when shop assignments are given. All shop projects will be issued in a drawing form and students are expected to understand and work from the shop drawings.

Course C -- Print Reading/ Math II

Course Number MTT115

Credits 1

Contact Hours 15

Total Hours 15

Category Core Course

Required Yes

Course Description Print reading will be taught using the work book, Machine Trades Print Reading. Thirty to forty five minutes of every Tuesday and Thursday will allowed for working in the work book. The instructor will find more challenging exercises for the students that accelerate and successfully complete the work book before the completion of the course. Print reading will also be used in a practical manner when shop assignments are given. All shop projects will be issued in a drawing form and students are expected to understand and work from the shop drawings.

Course D -- Print Reading/Math III

Course Number MTT210

Credits 1

Contact Hours 15

Total Hours 15

Category	Core Course
Required	Yes
Course Description	Print reading will be taught using the work book, Machine Trades Print Reading. Thirty to forty five minutes of every Tuesday and Thursday will allowed for working in the work book. The instructor will find more challenging exercises for the students that accelerate and successfully complete the work book before the completion of the course. Print reading will also be used in a practical manner when shop assignments are given. All shop projects will be issued in a drawing form and students are expected to understand and work from the shop drawings.

Course E -- Print Reading/Math IV

Course Number	MTT215
Credits	2
Contact Hours	45
Total Hours	45
Category	Core Course
Required	Yes
Course Description	Print reading will be taught using the work book, Machine Trades Print Reading. Thirty to forty five minutes of every Tuesday and Thursday will allowed for working in the work book. The instructor will find more challenging exercises for the students that accelerate and successfully complete the work book before the completion of the course. Print reading will also be used in a practical manner when shop assignments are given. All shop projects will be issued in a drawing form and students are expected to understand and work from the shop drawings.

Course F -- Lathe/Mill/Grind I

Course Number	MTT120
Credits	8
Contact Hours	195
Total Hours	195
Category	Core Course
Required	Yes
Course Description	Instruction will be given in the form of lectures, hand-outs, videotape, shop demonstrations, shop assignments and text book assignments. Students will perform required setups and operations of lathes, milling machines, and grinders in a timely manner. Students are required to practice all shop safety rules. Calculate feeds and speeds using the math formulas taught. Math will also be used to calculate hole pattern layouts, gear cutting, threading information, inspecting and quality control, and programming. Students will be required to perform machine operations to the satisfaction of the instructor. Students may be required to work in two or three person teams, but all students will be given the opportunity to demonstrate their competency level and ability by means of written tests, verbal communications, and demonstrating hands on abilities.

Course G -- Lathe/Mill/Grind II

Course Number	MTT125
Credits	8
Contact Hours	210
Total Hours	210
Category	Core Course
Required	Yes
Course Description	Instruction will be given in the form of lectures, hand-outs, videotape, shop demonstrations, shop assignments and text book assignments. Students will perform required setups and operations of lathes, milling machines, and grinders in a timely manner. Students are required to practice all shop safety rules. Calculate feeds and speeds using the math formulas taught. Math will also be used to calculate hole pattern layouts, gear cutting, threading information, inspecting and quality control, and programming. Students will be required to perform machine operations to the satisfaction of the instructor. Students may be required to work in two or three person teams, but all students will be given the opportunity to demonstrate their competency level and ability by means of written tests, verbal communications, and demonstrating hands on abilities.

Course H -- Lathe/Mill/Grind III

Course Number	MTT220
Credits	7
Contact Hours	165
Total Hours	165
Category	Core Course
Required	Yes
Course Description	Instruction will be given in the form of lectures, hand-outs, videotapes, shop demonstrations, shop assignments and text book assignments. Students will perform required setups and operations of lathes, milling machines, and grinders in a timely manner. Students are required to practice all shop safety rules. Calculate feeds and speeds using the math formulas taught. Math will also be used to calculate hole pattern layouts, gear cutting, threading information, inspecting and quality control, and programming. Students will be required to perform machine operations to the satisfaction of the instructor. Students may be required to work in two or three person teams, but all students will be given the opportunity to demonstrate their competency level and ability by means of written tests, verbal communications, and demonstrating hands on abilities.

Course I -- Lathe/Mill/Grind IV

Course Number	MTT225
Credits	9
Contact Hours	210

Total Hours	210
Category	Core Course
Required	Yes
Course Description	Instruction will be given in the form of lectures, hand-outs, videotapes, shop demonstrations, shop assignments and text book assignments. Students will perform required setups and operations of lathes, milling machines, and grinders in a timely manner. Students are required to practice all shop safety rules. Calculate feeds and speeds using the math formulas taught. Math will also be used to calculate hole pattern layouts, gear cutting, threading information, inspecting and quality control, and programming. Students will be required to perform machine operations to the satisfaction of the instructor. Students may be required to work in two or three person teams, but all students will be given the opportunity to demonstrate their competency level and ability by means of written tests, verbal communications, and demonstrating hands on abilities.

Course J -- Ben/Saw/Drill

Course Number	MTT230
Credits	4
Contact Hours	90
Total Hours	90
Category	Core Course
Required	Yes
Course Description	Instruction will be given in the form of lectures, hand-outs, videotapes, shop demonstrations, shop assignments and text book assignments. Students will perform required setups and operations of saws, drill presses, and perform bench work in a timely manner. Students are required to practice all shop safety rules. Calculate feeds and speeds using the math formulas taught. Math will also be used to calculate hole pattern layouts. The student will be required to saw material to length, sawing materials to shape, and accomplish various projects with hand tools on the bench. Students will be required to perform machine operations to the satisfaction of the instructor. Students will be given the opportunity to demonstrate their competency level and ability by means of written tests, verbal communications, and demonstrating hands on abilities.

Course K -- Inspection & QA

Course Number	MTT130
Credits	2
Contact Hours	30
Total Hours	30
Category	Core Course
Required	Yes
Course Description	Inspection & Quality Control will be taught using the work book, Machine Trades Print Reading, Shop Reference for Students and Apprentices, and hands on practices. The instructor will find more

challenging exercises for the students that accelerate and successfully complete the course.

Course L -- Workplace skills I

Course Number	MTT150
Credits	1
Contact Hours	15
Total Hours	15
Category	Required
Required	Yes
Course Description	This course utilizes Key Train Software to assist in advancement of knowledge in Applied Math and Reading for Information WorkKey assessments that are required prior to exiting the program. Students will also be required to attend seminars provided through the Career Resource Center. Seminar topics include interview techniques, developing and preparing a resume, completing job applications, ethics, and teamwork.

Course M -- Workplace skills II

Course Number	MTT250
Credits	1
Contact Hours	15
Total Hours	15
Category	Required
Required	Yes
Course Description	This course is the final preparation for the exit assessment by using Key Train software for Applied Math and Reading for Information. A student will be required to attend remaining seminars that were not attended in Workplace Skills I through the Career Resource Center.

Course N -- OJT

Course Number	MTT260
Credits	3
Contact Hours	135
Total Hours	135
Category	Elective
Required	No
Course Description	OJT (On-the-Job Training) is an elective course for a student to work at a job site to apply skills and knowledge acquired in the program. A student is eligible for OJT only upon completion of all the program competencies, 90% attendance throughout the program, all expenses paid to the school, completion of the institution exit assessment, and agreement completed with an employer. If a student does not comply to the attendance and job performance expectations of the employer, the student will be required to return to the program. This is a pass/fail course.