

Machine Shop

Mechanical and Transportation Technology

Course Number: MAC9200	Contribution to Program: Vocational	Normative Hours: 90
Applicable Program(s): 0550X01FWO EME Technician - Robotics	AAL: 2	Core/Elective: Core
Prepared by: James Standing Professor		Approval Date: 24/06/2012
Co-Requisites N/A		Approved by: Misheck Mwaba, Ph.D., P.Eng. Chair, Mechanical & Transportation Technology
Pre-Requisites MAT8001		Approved for Academic Year: 2012-2013

COURSE DESCRIPTION

The principles of machining are covered. Focus is on metal removal operations and the selection of machine tools for specific operations, including the use of drill presses, lathes, milling machines, and grinders and jig borers.

RELATIONSHIP TO VOCATIONAL LEARNING OUTCOMES

This course contributes to your program by helping you achieve the following Vocational Learning Outcomes:

EME Technician - Robotics 0550X01FWO

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| 5 | Apply the principles of engineering, mathematics, and science to analyze and solve routine technical problems and to complete work related to electromechanical engineering.(T,A) |
| 6 | Assist in the specification of manufacturing materials, processes, and operations to support the design and production of mechanical components.(T,A) |
| 14 | Perform all work in accordance with relevant law, policies, codes, regulations, safety procedures, and standard shop practices.(T,A) |

T: Teach **A:** Assess **CP:** Culminating Performance

ESSENTIAL EMPLOYABILITY SKILLS

The course contributes to your program by helping you achieve the following Essential Employability Skills:

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| 3 | Execute mathematical operations accurately.(T,A) |
| 4 | Apply a systematic approach to solve problems.(T,A) |
| 5 | Use a variety of thinking skills to anticipate and solve problems.(T,A) |
| 7 | Analyze, evaluate and apply relevant information from a variety of sources.(T,A) |
| 10 | Manage the use of time and other resources to complete projects.(T,A) |
| 11 | Take responsibility for one's own actions, decisions and consequences.(T,A) |

T: Teach **A:** Assess **CP:** Culminating Performance

COURSE LEARNING REQUIREMENTS/EMBEDDED KNOWLEDGE AND SKILLS

COURSE LEARNING REQUIREMENTS When you have earned credit for this course, you will have demonstrated the ability to:	EMBEDDED KNOWLEDGE AND SKILLS
1. Practice Machine Shop Safety.	<ul style="list-style-type: none"> 1 Familiarity with shop features, power panels, fire extinguishers, machine guarding. 1 House keeping issues. 1 Personal safety equipment and clothing. 1 Behaviour in the shop.

2. Identify, select and use appropriate hand tools and layout tools.	<ul style="list-style-type: none"> 1 Hammers, bench vices, wrenches, screw drivers, saws, files, taps, dies and reamers. 1 Layout dye, surface plates, layout tables, scribe, divider, punches and accessories.
3. Select and use proper measuring tools.	<ul style="list-style-type: none"> 1 Micrometer measuring tools, vernier tools, dial indicators, steel rule, combination sets, precision square, thread pitch gauges, telescopic and small hole gauges.
4. Read and interpret reference tables, charts and drawing information.	<ul style="list-style-type: none"> 1 Conversion tables, speeds and feeds, tap drill sizes. 1 Extract production information from engineering drawings.
5. Set up and operate Drill Presses.	<ul style="list-style-type: none"> 1 Machine safety concerns. 1 Select tooling and perform proper set ups. 1 Calculate proper RPM. 1 Operation principles. 1 Perform drilling and machine reaming.
6. Set up and operate Engine Lathes.	<ul style="list-style-type: none"> 1 Machine safety concerns. 1 Naming of major parts and controls. 1 Operation principles. 1 Select tooling and perform proper set ups. 1 Calculate proper RPM. 1 Perform facing, turning, drilling, machine reaming, threading, tapping and counterboring.
7. Set up and operate Milling Machines.	<ul style="list-style-type: none"> 1 Machine safety concerns. 1 Naming of major parts and controls. 1 Operation principles. 1 Select tooling and perform proper set ups. 1 Calculate proper RPM and Feed Rates. 1 Perform roughing and finishing cutting, use of an edge finding tool, tooling offsets, indexing and drilling.
8. Operate a Pedestal Grinder.	<ul style="list-style-type: none"> 1 Produce a Tool Bit for the Engine Lathe.

LEARNING RESOURCES

Textbook -
THE HOME MACHINIST'S HANDBOOK
Author: DOUG BRINEY
ISBN: 0 – 8306 – 1573 – 3
MCGRAW HILL

Teachers notes (Power Points) and handouts (Shop Drawings of Projects)

LEARNING ACTIVITIES

During this course, you are likely to experience the following learning activities:

Samples of learning activities include;
Demonstrations, Verbal instructions, Workshop applications and Self learning.

EVALUATION/EARNING CREDIT

The following will provide evidence of your learning achievements:	This activity validates the following Course Learning Requirements and/or Essential Employability Skills:
2 Plates (helix coil) 15% of Final Grade	<ul style="list-style-type: none"> 1 Identify, select and use appropriate hand tools and layout tools. - [CLR 2] 1 Set up and operate Milling Machines. - [CLR 7] 1 Practice Machine Shop Safety. - [CLR 1]

	<ul style="list-style-type: none"> 1 Select and use proper measuring tools. - [CLR 3] 1 Read and interpret reference tables, charts and drawing information. - [CLR 4] 1 Set up and operate Drill Presses. - [CLR 5] 1 Execute mathematical operations accurately. - [EES 3] 1 Apply a systematic approach to solve problems. - [EES 4]
Final Test 10% of Final Grade	<ul style="list-style-type: none"> 1 Use a variety of thinking skills to anticipate and solve problems. - [EES 5] 1 Analyze, evaluate and apply relevant information from a variety of sources. - [EES 7]
Work Habits and Attendance 10% of Final Grade	<ul style="list-style-type: none"> 1 Manage the use of time and other resources to complete projects. - [EES 10] 1 Take responsibility for one's own actions, decisions and consequences. - [EES 11]
Drill Point Gauge shop project 5% of Final Grade	<ul style="list-style-type: none"> 1 Select and use proper measuring tools. - [CLR 3] 1 Read and interpret reference tables, charts and drawing information. - [CLR 4] 1 Set up and operate Drill Presses. - [CLR 5] 1 Practice Machine Shop Safety. - [CLR 1] 1 Identify, select and use appropriate hand tools and layout tools. - [CLR 2] 1 Execute mathematical operations accurately. - [EES 3]
Toolbit for engine lathe 5% of Final Grade	<ul style="list-style-type: none"> 1 Select and use proper measuring tools. - [CLR 3] 1 Read and interpret reference tables, charts and drawing information. - [CLR 4] 1 Practice Machine Shop Safety. - [CLR 1] 1 Operate a Pedestal Grinder. - [CLR 8]
Tests and Quizzes to test key terms and concepts. 20% of Final Grade	<ul style="list-style-type: none"> 1 Identify, select and use appropriate hand tools and layout tools. - [CLR 2] 1 Set up and operate Milling Machines. - [CLR 7] 1 Practice Machine Shop Safety. - [CLR 1] 1 Operate a Pedestal Grinder. - [CLR 8] 1 Select and use proper measuring tools. - [CLR 3] 1 Read and interpret reference tables, charts and drawing information. - [CLR 4] 1 Set up and operate Drill Presses. - [CLR 5] 1 Set up and operate Engine Lathes. - [CLR 6] 1 Execute mathematical operations accurately. - [EES 3] 1 Apply a systematic approach to solve problems. - [EES 4] 1 Analyze, evaluate and apply relevant information from a variety of sources. - [EES 7]
Machinist Hammer 20% of Final Grade	<ul style="list-style-type: none"> 1 Identify, select and use appropriate hand tools and layout tools. - [CLR 2] 1 Set up and operate Milling Machines. - [CLR 7] 1 Practice Machine Shop Safety. - [CLR 1] 1 Select and use proper measuring tools. - [CLR 3] 1 Read and interpret reference tables, charts and drawing information. - [CLR 4]

	<ul style="list-style-type: none"> 1 Set up and operate Engine Lathes. - [CLR 6] 1 Execute mathematical operations accurately. - [EES 3] 1 Apply a systematic approach to solve problems. - [EES 4]
Hub (Sleeve) 15% of Final Grade	<ul style="list-style-type: none"> 1 Identify, select and use appropriate hand tools and layout tools. - [CLR 2] 1 Set up and operate Milling Machines. - [CLR 7] 1 Select and use proper measuring tools. - [CLR 3] 1 Read and interpret reference tables, charts and drawing information. - [CLR 4] 1 Set up and operate Engine Lathes. - [CLR 6] 1 Practice Machine Shop Safety. - [CLR 1] 1 Execute mathematical operations accurately. - [EES 3] 1 Apply a systematic approach to solve problems. - [EES 4]

COLLEGE GRADING NUMERICAL EQUIVALENT TABLE

Final Grade	Mark Equivalent	Numeric Value	Final Grade	Mark Equivalent	Numeric Value
A+	90-100%	4.0	C+	67-69%	2.3
A	85-89%	3.8	C	63-66%	2.0
A-	80-84%	3.6	C-	60-62%	1.7
B+	77-79%	3.3	D+	57-59%	1.4
B	73-76%	3.0	D	53-56%	1.2
B-	70-72%	2.7	D-	50-52%	1.0
			F	0-49%	0
			FSP	0	0

PRIOR LEARNING ASSESSMENT AND RECOGNITION

Students who wish to apply for prior learning assessment and recognition (PLAR) need to demonstrate competency at a post-secondary level in all of the course learning requirements outlined above. Evidence of learning achievement for PLAR candidates includes:

- 1 Not Applicable

RELATED INFORMATION

The following information is course-specific:

Teacher contact information:

Name: Mr. Gilles Michaud

Office: T215

Phone: 727-4723 ex: 5565

E-mail: gilles.michaud@algonquincollege.com

Name: Richard Lacelle

Office: T215

Phone: 727-4723 ex: 2414

E-mail: lacellr@algonquincollege.com

Respect for Confidentiality

Students are required to respect the confidentiality of employer, client and/or patient information, interactions, and practices that occur either on Algonquin College premises, or at an affiliated clinical/field/co-op placement site. Concerns regarding clients, patients, and/or employer practices are to be brought to the attention of the program coordinator, or designated field/clinical/co-op placement supervisor so that they may be resolved collaboratively. Such concerns are not to be raised publicly either verbally, in writing, or in electronic forums. These matters are to be addressed through established program communication pathways.

The following information is school/department-specific:

GENERAL CLAUSES - School of Advanced Technology

Harassment/Discrimination/Violence will not be tolerated. Any form of harassment (sexual, racial, gender or disability-related), discrimination (direct or indirect), or violence, whether towards a professor or amongst students, will not be tolerated on the college premises. Action taken will start with a formal warning and proceed to the full disciplinary actions as outlined in Algonquin College Policy - HR22.

Harassment means one or a series of vexatious comment(s) or conduct related to one or more of the prohibited grounds that is known or ought reasonably to be known to be unwelcome/ unwanted, offensive, intimidating, derogatory or hostile.

This may include, but is not limited to: gestures, remarks, jokes, taunting, innuendo, display of offensive materials, offensive graffiti, threats, verbal or physical assault, academic penalties, stalking, slurs, shunning or exclusion related to the prohibited grounds.

For further information, a copy of the official policy statement can be obtained from the Student Association.

The Use of Electronic Devices, with the sound turned on, during classes is strictly prohibited. In particular, cell phones are not to be used to communicate during a class. The use of any electronic devices during exams and mid-term tests, other than those sanctioned by the faculty in charge of the examination, is strictly prohibited.

Anyone caught using a prohibited device will be considered to have plagiarized, and will be treated as such in accordance with College Plagiarism Policy. For further details on this directive, consult the Algonquin College Policy AA32 on the use of Electronic Devices in Class and Exams.

The School of Advanced Technology's Standard Operating Procedure on Plagiarism and Academic Honesty defines plagiarism as an attempt to use or pass off as one's own idea or product, work of another without giving credit. Plagiarism has occurred in instances where a student either directly copies another person's work without acknowledgement; or, closely paraphrases the equivalent of a short paragraph or more without acknowledgement; or, borrows, without acknowledgement, any ideas in a clear and recognizable form in such a way as to present them as one's own thought, where such ideas, if they were the student's own would contribute to the merit of his or her own work.

Plagiarism is one of the most serious academic offenses a student can commit. Anyone found guilty will, on the first offense, be given a written warning and an F on the plagiarized work. If the student commits a second offense, an F will be given for the course along with a written warning. A third offense will result in suspension from the program and/or the college.

For further details on this directive, consult the Algonquin College Policy - AA20 and the School of Advanced Technology's Standard Operating Procedure on Plagiarism and Academic Dishonesty.

Respect for Confidentiality

Students are required to respect the confidentiality of employer, client and/or patient information, interactions, and practices that occur either on Algonquin College premises, or at an affiliated clinical/field/co-op placement site. Concerns regarding clients, patients, and/or employer practices are to be brought to the attention of the program coordinator, or designated field/clinical/co-op placement supervisor so that they may be resolved collaboratively. Such concerns are not to be raised publicly either verbally, in writing, or in electronic forums. These matters are to be addressed through established program communication pathways

Disruptive Behaviour is any conduct, or threatened conduct, that is disruptive to the learning process or that interferes with the well-being of other members of the College community. It will not be tolerated.

Members of the College community, both students and staff, have the right to learn and work in a secure and productive environment. The College will make very effort to protect that right.

Incidents of disruptive behaviour must be reported in writing to the departmental Chair as quickly as possible. The Chair will hold hearings to review available information and determine any sanctions that will be imposed. Disciplinary hearings can result in penalties ranging from a written warning to expulsion.

For further details consult the Algonquin College Policy - SA07.

June 15, 2012

The following information is College-wide:**Email**

Algonquin College provides all full-time students with an e-mail account. This is the address that will be used when the College, your professors, or your fellow students communicate important information about your program or course events. It is your responsibility to ensure that you know how to send and receive e-mail using your Algonquin account and to check it regularly.

Centre for Students with Disabilities (CSD)

If you are a student with a disability, it is strongly recommended that you identify your needs to the professor and the Centre for Students with Disabilities (CSD) by the end of the first month of the semester in order that any necessary support services can be arranged for you.

Academic Integrity* & Plagiarism*

Adherence to acceptable standards of academic honesty is an important aspect of the learning process at Algonquin College. Academic work submitted by a student is evaluated on the assumption that the work presented by the student is his or her own, unless designated otherwise. For further details consult Algonquin College Policies AA18 <http://www2.algonquincollege.com/directives/files/2012/04/AA18.pdf> and AA20 <http://www2.algonquincollege.com/directives/files/2011/08/AA20.pdf>

Student Course Feedback*

It is Algonquin College's policy to give students the opportunity to complete a course assessment survey in each course that they take which solicits their views regarding the curriculum, the professor and the facilities. For further details consult Algonquin College Policy AA25 <http://www2.algonquincollege.com/directives/files/2011/10/AA25.pdf>

Use of Electronic Devices in Class*

With the proliferation of small, personal electronic devices used for communications and data storage, Algonquin College believes there is a need to address their use during classes and examinations. During classes, the use of such devices is disruptive and disrespectful to others. During examinations, the use of such devices may facilitate cheating. For further details consult Algonquin College Policy AA32 <http://www2.algonquincollege.com/directives/files/2011/11/AA32.pdf>

Transfer of Credit

Students, it is your responsibility to retain course outlines for possible future use to support applications for transfer of credit to other educational institutions.

* College policies (previously called directives) are under review and redesign. The term *directives* is being retired. As such, the policy classification nomenclature is in transition. Students, it is your responsibility to refer to the Algonquin College Directives/Policies website for the most current information available at: (<http://www2.algonquincollege.com/directives/>)