

**Spring 2014 Syllabus**  
**Manufacturing Process Lecture/Lab – MFG\*102/103**  
**Room B108, Mondays, 5:30 – 9:55 p.m.**

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**Instructors:** Prof. Wanda Short Room C-128 ph: 860-215-9473 wshort@trcc.commnet.edu  
Prof. Andrew Shetland Room xxxx ph: 860-917-4535 andrew\_shetland@yahoo.com

**Contact Methods:** Blackboard Learn Messaging (preferred), Email & Telephone (Alternative or Emergency)

**Office Hours:** Posted on Blackboard Learn

**Online Discussions:** via Blackboard Learn

**Course Description:**

Manufacturing methods of metals and plastics including metal casting, forming, machining, welding, and plastic processing. Through lecture, open discussion and practical hands on experience, this course will develop a working knowledge of machining practices for the manufacturing engineer.

MFG\* K102; 3 CREDIT HOURS; MANUFACTURING PROCESSES

*Co-requisite: MFG\* K103*

This course studies manufacturing: making goods and wares by industrial processes. The course will provide theoretical experience in the scientific, engineering, and economic principles on which the various manufacturing processes are based.

MFG\* K103; 1 CREDIT HOUR; MANUFACTURING PROCESSES LAB

*Co-requisite: MFG\* K102, TCN\* K105*

This course provides laboratory emphasis on common metal cutting tools and lathe operations, as well as on associated precision measuring tools and instruments. The labs will involve set-ups and procedures for milling machines, lathes, grinders, drill presses, and some measuring instruments.

**Text Book:**

Manufacturing Processes Lab – Knowles, Patrick. H., ISBN 0-390-56824-4

**Lecture & Lab Outcomes:**

- Students will practice the skills needed to work effectively in teams and as an individual.
- Students will demonstrate the ability to use appropriate mathematical and computational skills needed for engineering technology applications.
- Students will combine oral, graphical, and written communication skills to present and exchange information effectively and to direct manufacturing activities.
- Students will know of a professional code of ethics.
- Students will describe concepts relating to manufacturing quality, timeliness, and continuous improvement
- Students will describe how the concepts of metal manufacturing, statistics, process automation, computer-aided design and manufacturing, and organizational management affects manufacturing operations.
- Students will illustrate an ability to think critically and identify, evaluate and solve complex technical and non-technical problems; demonstrate creativity in designing problem solutions; and conduct and interpret experimental data and outcomes.
- Students will recognize the need to be lifelong learners.

**Grading Policy:****LECTURE**

Three exams will be given during the semester. The dates of the exams are noted in the Lecture Schedule. Approximately one hour of the class meeting will be devoted for each exam. Final grades will be based on the following weighting:

Exam Average	30%
LearnMate CNC Milling	32%
Presentations	32%
Participation	6%

**LAB:**

Silicone Molding Project	30%
CNC Project	35%
Machining Project	35%

**Grading Policy:** Grades will be assigned according to the following scale:

94 -100	A
90 - 93	A -
87 - 89	B +
83 - 86	B
80 - 82	B -
77 - 79	C +
73 - 76	C
70 - 72	C -
67 - 69	D +
63 - 66	D
60 - 62	D -
Below 60	F

**Attendance:** Attendance will be taken and although it is not intended to be use for grading purposes, it may be used in determining part of the final grade.

**Instructor Assistance:** Seeking help from the instructor outside of class is encouraged if you are having difficulty understanding course material. You are encouraged to seek assistance during class as well as during office hours and other times by appointment.

**Academic Integrity:** Academic integrity is essential to a useful education. Failure to act with academic integrity severely limits a person's ability to success in the classroom and beyond. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. In this class and in the course of your academic career, present only your own best work; clearly document the sources of the material you use from others; and act at all times with honor.

**Withdrawal:** A student who finds it necessary to discontinue a course must complete a "Withdrawal Request Form" available in the Registrar's office within the time limits of the semester calendar. Students who do not withdraw, but stop attending will be assigned an "N" grade which may impact their financial aid status. The last day to withdraw from classes is May 12, 2014.

**Disabilities Statement:** If you are a student with a disability and believe you will need accommodations for this class, you must contact the TRCC's Disabilities Counseling Services at (860) 892-5751 or (860) 383-5240. To avoid any delay in the receipt of accommodations, you should contact the counselor as soon as possible. Please note that the instructor cannot provide accommodations based upon disability until the instructor has received an accommodation letter from the Disabilities Counselor.

Date	Class #	Topic	Lab	Comments	Instructor
Jan 27	1	Introduction to Manufacturing	Safety/ Orientation/ Measurement Tools/		WS
Feb 3 No class Inclement Weather	2	Silicone Elastomer Technology	Silicone Mold Making	Silicone Product Categories Why Silicone? Silicone Markets and Applications Silicone Manufacturing Process Nomenclature HCE/ HCR Technology LIM/LSR Technology Testing and Specifications Elastomer Properties	WS
Feb 10 *(Feb 17 MLK Holiday)	3	Liquid Silicone Rubber (LSR / LIM)	Silicone Mold Making	Why Liquid Silicones? Comparison with HCE and TPE Process Overview Dispensing Systems Injection Equipment Molding Parameters Automation Demolding Flow Analysis and Simulation Troubleshooting	WS
Feb 24	4	<b>Take-Home Exam I due March 10 via Blackboard Learn;</b>  Tooling Design And Construction	Silicone Mold Making	Materials Machining Methods Hot Runner vs. Cold Runner Valve Gate vs. Open Gate Venting and Gating Cavitation Balanced Design DOs and DON'Ts	WS
Mar 3	5	Survey of Manufacturing Processes (Mat'L Removal, Change of Form, Change of Condition, Mat'l Joining, Finishing)	Traditional Machining	Manufacturing Processes for Technology (2e) – Fellers, W. ISBN 0-13-01779-1	AS
Mar 10 *(Mar 17 Spring Brk)	6	Material Removal: Mechanical	Traditional Machining	Manufacturing Processes for Technology (2e) – Fellers, W. ISBN 0-13-01779-1 pg. 75-119	AS
Mar 24	7	Material Removal: Electrical, Chemical, Thermal	Traditional Machining	Manufacturing Processes for Technology (2e) – Fellers, W. ISBN 0-13-01779-1 pg. 121-145	AS
Mar 31	8	Lean; <b>Exam II</b>	Traditional Machining		AS
Apr 7	9	What Is Numerical Control & What Does It Do?	CNC		AS
Apr 14	10	How Does Numerical Control Work?	CNC		WS
Apr 21	11	Programming: Making N/C Do What You Want	CNC		WS
Apr 28	12	The Preliminaries of Programming	CNC		AS
May 5	13	TBD (field trip?)			AS/ WS
May 12	14	Presentations			AS
May 19	15	<b>Exam III; Ethics</b>			WS

**Casting/Mold/CNC**

[http://academy.cba.mit.edu/2013/students/perezdelama.jose/07\\_molding\\_casting\\_jpl.html](http://academy.cba.mit.edu/2013/students/perezdelama.jose/07_molding_casting_jpl.html)

[http://academy.cba.mit.edu/classes/molding\\_casting/index.html](http://academy.cba.mit.edu/classes/molding_casting/index.html)

**Silicone Mold Making**

<http://www.cs.cmu.edu/~rapidproto/manufacturing/molds/silicone.html>

<http://www.smooth-on.com/howto.php>

