###### COURSE SYLLABUS

###### Semester:  Year: 2013

**Mission Statement:**

Richard J. Daley College provides high-quality education which leads to academic success, career development, and personal enrichment that fulfill diverse community needs.

###### Course (Discipline): 340MFGT Number: 141 Section:       IAI#:

**Course Title:** Manufacturing Materials and Processes **Length of Course (Weeks):** 16

**Credit Hours:** 3 **Lecture Hours:** 3 **Lab Hours:** 0 **Contact Hours:** 3

**Meeting Day(s):**       **Times:**       **Building:**       **Classroom #:**

**Syllabus can be found on Blackboard website at** [**https://ccc.blackboard.com/webapps/login/**](https://ccc.blackboard.com/webapps/login/)**.**

###### Dean, College to Careers in Advanced Manufacturing \_\_Ray Prendergast\_\_\_\_\_\_\_

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#### Office hours:

**Course Description**:

The course provides a general understanding of the behavior of the materials commonly used in manufacturing; the basic techniques used in processing them into useful products; the scientific theory underlying those processes; and the criteria for selecting particular tools, machines, and processes. Students will have the opportunity to earn the MSSC Manufacturing Processes and Production credential. Writing assignments, as appropriate to the discipline, are part of this course.

**Course Prerequisites**:

Eligibility for Reading 99, or Consent of Department Chairperson.

**Students Course is Expected to Serve:**

Students enrolled in the Manufacturing Technology program. This course is required for the AAS in Manufacturing Technology.

**Course Objectives**:

* Illustrate the principles of the physical properties of metals and nonmetals used in manufacturing processes.
* Deliver basic knowledge of extractive processes for materials used in manufacturing.
* Explain knowledge of key manufacturing processes and their applications in a modern manufacturing environment.
* Earn the MSSC Manufacturing Processes and Production credential which is part of the Production Technologist certification.

**Student Learning Outcomes:**

Upon completion of this the student will be able to:

* Identify the physical properties of materials commonly used in manufacturing;
* Identify mild steel, stainless steel, aluminum, tool steel, and carbide;
* Explain four different casting processes, three different welding processes, three different plastic molding processes, and two types of additive manufacturing.
* Compare cost drivers in machining and stamping;
* Select appropriate metalworking processes and tools to make a part for machinery or a fabricated metal item.

**Recommended Texts and Course Materials:**

***Texts:***

Manufacturing Skill Standards Council. (2006). *High Performance Manufacturing*. Glencoe, IL: McGraw Hill Glencoe. ISBN: 978-0078614873

Tomovic, M., Neely, J., Bruce, G. (2003). *Modern Materials and Manufacturing Processes*, *Third Edition*. New York, NY: Prentice Hall.

***Materials:***

**Additional Course Requirements:**

N/A

**Recommended Methods of Instruction:**

The method of instruction will include lecture, small group work, and project-based learning.

**Recommended Methods of Evaluation:**

Midterm and final course grades will be based on the following assessments:

Chapter tests

Projects

Final examination

Attendance

Grading Scale:

90-100% = A

 80-89 = B

 70-79 = C

 60-69 = D

 Below 60 = F

See the Policy on grade designations and grade appeals at:

<http://www.ccc.edu/colleges/daley/departments/Pages/Grade-Appeal-Policy-and-Procedure.aspx>

**NOTE:** Type or copy and paste the link above into a web browser to view its content.

### Topical Outline / Course Calendar:

1. Waves of Change in Manufacturing: from mass production to lean production
2. Atomic and Crystalline Structure of Materials
3. Heat Treatment of Metals
4. Extension and Refinement of metals and nonmetals
5. Selection and Application of Materials
6. Casting Process
7. Stamping and Metalforming
8. Cutting processes, Midterm Exam
9. Powder Metallurgy
10. Joining Processes
11. Plastic and Composites Processing
12. Corrosion
13. Design, Tooling, and Production Lines
14. Manufacturing, Automation, and Robotics
15. Total Productive Maintenance
16. Lean Environment, Final Exam

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