

COURSE NAME: Metal Casting 105

DATE: June 5, 2015

INSTRUCTOR: Mr. Tony Liuzzo Phone 717-799-4663 (cell) 299-7323 (office)

COURSE HOURS: Monday through Friday 8:30 AM to 3:00 PM, eighty hours total/week both class and foundry.

OFFICE HOURS: Monday through Friday 8:00 – 8:30 AM

COURSE DESCRIPTION:

This course will prepare students for entry level foundry jobs. Metal Casting 105 introduces the basics of the foundry industry. This includes the history of metal casting, metal identification and characteristics, pattern types, sand preparation, molding, furnace and metal preparation, cooling and finishing.

ELECTRONIC DEVICES:

Use of electronic devices, cell phones and iPads are not allowed.

DRESS CODE:

Long pants, sleeved shirts and work boots are required in the foundry area, hats and hoodies are not allowed in the classroom.

COURSE OBJECTIVES:

1. The course will consist of training men and woman for entry level foundry positions, the course will be eighty hours in length.
2. The course will begin with a history of the foundry industry from its beginning to the present day, and how castings fit into our daily lives. It will stress the safe way of doing the jobs.
3. We will explain the core making process, the different ways of making cores and why they must be used in certain molding applications.
4. We will teach and demonstrate both the making and pouring of molds, and will be melting both brass and aluminum.
5. We will be learning about sand systems, sand testing and we will be mulling our own sand for the molding process.
6. We will be learning about patterns, gating systems and risers and why they are necessary.
7. We will learn the difference between ferrous and non-ferrous metals.
8. We will cover the finishing process from grinding through the inspection process.
9. We will be viewing videos of area foundries to give the students some feedback.
10. Additional information may be added to this course if necessary.
11. Maintain notes and classroom handouts.
12. Attend class and labs.
13. Be attentive and participate in class and lab.
14. Complete all assignments.

15. Maintain a passing grade.

COURSE COMPETENCIES: Students will be able to:

1. Describe the importance of metal casting in modern manufacturing.
2. Understand the evolution of metal casting from ancient times to the present.
3. Understand the basics of core making by properly making a core.
4. Understand the basics of making sand by mulling the sand.
5. Understand the basics of mold making by properly making a mold.
6. Understand the basics of melting metal by safely melting metal.
7. Understand the basics of inspecting castings by comparing a good casting to a scrap casting.
8. Understand the basics of grinding castings by grinding an unfinished casting.
9. Understand how to work safely in the foundry environment by following all safety policies.

Lab Assignments: 75% of grade

Students must maintain 70% to pass course.

ATTENDANCE AND TARDINESS:

All absences must be approved. The definition of an approved absence is illness with a doctor's excuse, doctor appointments with documentation and court appearances with documentation. **The student will be dropped from the program at their 2nd unapproved absence.** In the event of an illness, the student is required to notify Mr. Liuzzo at 717- 799-4663. Leave a message on voicemail if you do not get to talk to him directly.

Tardiness is not acceptable in this class. Due to the intense pace of instruction and students are required to be in class by the start of class at 8:30 AM with all the issued instructional materials. **Students will not be permitted in class after the first 10 minutes. The student will receive 1 unapproved absence for 2 tardies.**

PLANNED SEQUENCE OF LEARNING ACTIVITIES:

Week one:

- Introduction to metal casting
- History of metal casting
- Core making different types
- Sand preparation
- Pattern Design
- Gating systems and risering
- Differences between ferrous and non-ferrous metals

Week two:

- Molding Practices
- Melting Practices

- Pouring Process for brass
- Pouring Process for aluminum

Week three:

- Finishing process
- Grinding process
- Inspection process
- Interviewing and Employment workshop with Mrs. Grove
- Trip to tour foundry and meet staff
- Graduation and Certificate Ceremony

References:

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| • Handbook of Aluminum Castings, Vol. 1 | George E. Totten, Scott |
| | McKensey |
| • Iron Castings Handbook | Charles Wilson, Timothy Opar., Iron Castings |
| Society | |
| • Casting Copper-based Alloys | American Foundryman's Society |
| • American Malleable Iron | Publisher |
| • Gray and Ductile Iron Handbook | Iron Foundry Society |
| • RAO,TE RAMANA Metal Casting | New Delhi, New Age International Principles |
| and Practice | Publishers 210 |

Prepared by Tony Liuzzo

June 4, 2015



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