

## Course Outline for WLDT 80

### THE WELDING BUSINESS

Effective: Fall 2011

#### I. CATALOG DESCRIPTION:

WLDT 80 — THE WELDING BUSINESS — 2.00 units

This course explores the combination of materials, labor and machines. This course examines the unique aspects associated with the operation of a successful welding business. This course provides a basic understanding of the flow of work through a welding operation from the initial customer contact through the completed component arriving at the customers receiving facility. A discussion of who the customer base is, how does the company locate work that fits their capability, the request for quotation, the processes of bidding on work, estimating, quotations, contract documents, codes, specifications, customer requirements, manufacturing travelers, quality control, manufacturing methods, labor, raw material sources, subcontractors, finishing, transportation, materials handling, packaging, and the process for getting paid for doing the work. Basic definitions of business concepts such as accounting, labor laws, compliance, taxes, cash flow, payroll accounts receivable, accounts payable, balance sheet, as well as profit and loss as they relate to a welding business.

2.00 Units Lecture

#### Grading Methods:

Letter or P/NP

#### Discipline:

	<u>MIN</u>
<b>Lecture Hours:</b>	36.00
<b>Total Hours:</b>	36.00

#### II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

#### III. PREREQUISITE AND/OR ADVISORY SKILLS:

#### IV. MEASURABLE OBJECTIVES:

**Upon completion of this course, the student should be able to:**

- A. Explain the work flow through a typical welding business;
- B. Explain what type of customer uses welding and fabrication services;
- C. Explain the scope and capabilities of a typical welding business;
- D. Explain how a welding business acquires work;
- E. Explain the process of competitive bidding;
- F. Demonstrate the process of price estimation;
- G. Demonstrate preparation of a professional, welding business price quotation;
- H. Explain the major components in a typical welding contract document package;
  - I. Explain what codes are typically applicable to a welding business;
  - J. Explain what specifications are and how they are used;
- K. Explain what customer requirements are and how they are used;
- L. Describe the role quality control plays in a successful operation;
- M. Explain auxiliary methods for manufacturing in a welding business;
- N. Explain what manufacturing travelers are and how they are used;
- O. Explain the differences typical of a union or non-union shop work environment;
- P. Explain the sources of various metals and other raw materials;
- Q. Explain the need and uses of subcontractors;
- R. Explain the options available in the area of metal finishing and sources;
- S. Explain the options available in the area of trucking and transportation;
- T. Explain the options available in the area of cranes, rigging and material handling;
- U. Explain the options available in the area of packaging and sources;
- V. Define basic business managerial operational concepts as they relate to a typical welding business.

#### V. CONTENT:

- A. The basic process of the flow of work through a welding operation
- B. The customer base
- C. Locating work that fits a facilities capability
- D. The request for quotation or RFQ process
- E. The processes of bidding on work
- F. Estimating
- G. Quotation process
- H. Contract documents

- I. Codes
- J. Specifications
- K. Customer requirements
- L. Manufacturing travelers
- M. Quality control
- N. Manufacturing methods
- O. Labor – Union and Non-Union
- P. Raw material sources
- Q. Using subcontractors
- R. Materials finishing
- S. Transportation and Trucking
- T. Materials handling
- U. Packaging
- V. Basic definitions of business concepts as they relate to a welding business such as:
  - 1. accounting
  - 2. labor laws
  - 3. regulatory compliance
  - 4. taxes
  - 5. cash flow
  - 6. payroll
  - 7. accounts receivable
  - 8. accounts payable
  - 9. balance sheet
  - 10. profit and loss

#### VI. METHODS OF INSTRUCTION:

- A. **Lecture** -
- B. Textbook reading assignment; additional internet and/or print assignment
- C. **Research** -
- D. Presentation of audio-visual materials
- E. **Field Trips** -
- F. Class and group discussions

#### VII. TYPICAL ASSIGNMENTS:

- A. Lectures
  - 1. The cost of labor in the finished product
  - 2. Sourcing raw materials for your project
- B. Reading assignment:
  - 1. Read the textbook chapter on materials handling
  - 2. Locate and read an article off the internet authored in the last 90 days on the subject of sheet metal processing, write a summary of what you read
- C. Homework:
  - 1. Read the textbook chapter in Milling Machines and answer these questions:
  - 2. What is a horizontal milling machine?
  - 3. What is a shell mill and when might we use it?
  - 4. What is the purpose of being able to adjust RPM on the spindle?
- D. Class and group discussions:
  - 1. Class discussion: What is the purpose of subcontractors in an industrial environment? What is their role in a typical welding business?
  - 2. Group discussion: When would we use computer controlled manufacturing techniques and processes? What are the advantages of computer controlled processing? What are the disadvantages?
- E. Audio-visual materials:
  - 1. Video of welding processes
- F. Field trip:
  - 1. Visit a local manufacturing company
- G. Research project:
  - 1. You are leader of your own manufacturing company. You just got an order to make 1000 of this item. The drawing gives you the material required. What manufacturing processes and equipment would you select, and explain in detail how you would make the item. Prepare a presentation and describe your method for manufacturing to the class. Provide a quotation based on the price of each component.

#### VIII. EVALUATION:

##### A. **Methods**

- 1. Exams/Tests
- 2. Quizzes
- 3. Research Projects
- 4. Papers
- 5. Home Work
- 6. Other:
  - a. Methods
    - 1. Quizzes
    - 2. Objective examinations (for lecture and text reading assignments)
    - 3. Analysis and evaluation of homework assignments
    - 4. Research project:
      - a. Written proposal
      - b. Outline
      - c. First Draft
      - d. Evaluation of final

##### B. **Frequency**

- 1. Frequency
  - a. Weekly Quizzes
  - b. Midterm and Final Examinations
  - c. Weekly homework evaluation
  - d. End-of-term evaluation of research project

#### IX. TYPICAL TEXTS:

- 1. Duvall, J. Barry, and David R. Hillis *Manufacturing Processes*. 2nd ed., Goodheart-Wilcox, 2008.

2. Lincoln Electric *Procedure Handbook of Arc Welding*. 14th ed., James F Lincoln Foundation, 2008.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Calculator