



OTC DAIHEN INC.
ADVANCED WELDING & ROBOTIC SYSTEMS
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FD21 Complete Maintenance Course Syllabus

- A.
 - 1. Course Title: FD Complete Maintenance
 - 2. Course Number: FD Maint.
 - 3. Class hours: Monday 10:00 AM to 12:00 PM, 1:00 PM to 4:30 PM
Tuesday – Thursday 9:00 AM to 12:00 PM, 1:00 PM to 4:30 PM
- B. 1. Prerequisites: none
- C. 1. Course description: The *Complete Maintenance Training* course will provide students with the knowledge necessary to perform basic maintenance and troubleshooting procedures. This course is designed for those personnel responsible the daily up-keep of the robots as well as those tasked with performing preventive and corrective maintenance procedures. Familiarization with robot manipulation and programming using the teach pendant is reviewed during this course however; students should have a working knowledge of programming prior to attending. There is no prerequisite for the *Complete Maintenance Training Course* however, DAIHEN, Inc. recommends that all persons attend the *Robot Training and Operation Course* prior to attending this course. **Please note this course is a NON-WELDING Course.**
- D. 1. Textbooks (1) Maintenance Training Guide.
- E. 1. Other required materials: none
- F. 1. Course objectives

The student shall be able to perform the following after completion of the course:

- a. Understand incoming power supply needs.
- b. Safely power up the robot and controller from a fully shutdown position.
- c. General robotic safety within working envelopes.
- d. Controller component identification.
- e. Troubleshoot the robot controller.
- f. Installation of optional robotic software and system recovery.
- g. WPS initialization and communication.
- h. Back-up system and program data.
- i. Torch alignment, auto TCP.
- j. Writing basic check point program
- k. Origin check/Absco offset procedure.
- l. Various methods of crash recovery and manipulator re-mastering.
- m. Proper procedures/cautions when changing motors, RVs, and harmonics.
- n. Preventative maintenance schedule.

G. Grading: A grade of 72% or greater is required to successfully complete the course.

H. Course outline

1. Monday: Introduction, course review, robot safety video and test, facility tour, basic programming review and lab.
2. Tuesday: Controller hardware and peripherals, block diagram description, part replacement procedures/lab, troubleshooting.
3. Wednesday: Manipulator exploded parts breakdown, motor, RV, and harmonic replacement procedures, and PM procedures.
4. Thursday: Crash recovery, machine adjustments, mastering, system recovery, optional software installation, final exam, course critique, and closing comments.

I. Other requirements and notes

1. Smoking is not permitted in the building. A designated outdoor smoking area is available at the back of the building.
2. Class participation and completion of all exercises is required
3. All safety rules must be followed at all times
 - a. Eye protection must be worn at all times in the lab area
 - b. Leather closed-tip shoes are to be worn at all times
 - c. Long pants must be worn at all times. No shorts please.
4. Lunch break will be 1 hour each day. Normal lunch hours will be from 12:00 PM – 1:00 PM. Students are responsible for lunch.
5. A student who misses more than $\frac{1}{2}$ day of instruction may be removed from the class at the discretion of Daihen, Inc. management and asked to return to their normal workplace.
6. Please arrive no earlier than 15 minutes before class
7. Proper attire is required at all times. Please do not wear clothing bearing slogans or sayings that could be offensive to others.