Course 350

Microprocessors in Signal Systems

INSTRUCTOR GUIDE

SIGNALS TRAINING CONSORTIUM

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Course Preparation

Checklist for Instruction

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✓	Confirm the training dates, location, and number of participants.
	Ensure you have all materials listed in the section **Materials for Instruction**.
	Ensure you have all that is listed in the section **Supplies, Audio-Visual Equipment,** and **Internet Access.**
	Have an attendance sign-in sheet printed for each day of class.
	Read and study the Instructor Guide, PowerPoint presentation, and any State or local documentation pertaining to the local environment.
	If using case studies, review the case studies ahead of time and, where applicable, select the most appropriate cases studies for your audience.
	Familiarize yourself with the Participant Guide.
	Collaborate with local host/coordinator to determine who will print the Certificate of Completion for each participant.

Supplies, Audio-Visual Equipment, Internet Access

The following is important for the adequate delivery of this course:

✓	LCD projector compatible with a notebook computer and cables for proper connection.
	Computer with software to run Microsoft PowerPoint.
	Electronic remote device to advance slides in PowerPoint presentation, if available.
	Projection screen (at least 6' x 6').
	Pointer (preferably laser type).
	Twenty-foot or longer extension cord.
	Dry erase board with dry erase markers and eraser.
	Flip chart with markers.
	Supplies such as pencils, note pads, markers, highlighters.
	Access to a lab, maintenance facility, signaling equipment for hands-on lessons.
	Internet access.
	Room audio.
	All equipment should be placed and tested in the room. The instructor should check at least one hour prior to the first day of the course.

Best Practices for Delivering Training

1. Read through this entire Instructor Guide. Make your own notes as necessary.

2. Preview the PowerPoint presentation that comes with this course and practice what you will say and do during each slide. Note the ways that you will customize how each slide will be delivered to the participants. For example, you may have comments to add, additional take-aways, and other ways you can enhance learning.

3. When presenting, use PowerPoint's **Presenter View option** which makes you see your notes as you present while the participants see only the slides. When your computer is connected to the projector and you start the slide show, Presenter View appears on your computer's screen, while only the slides appear on the projector screen.
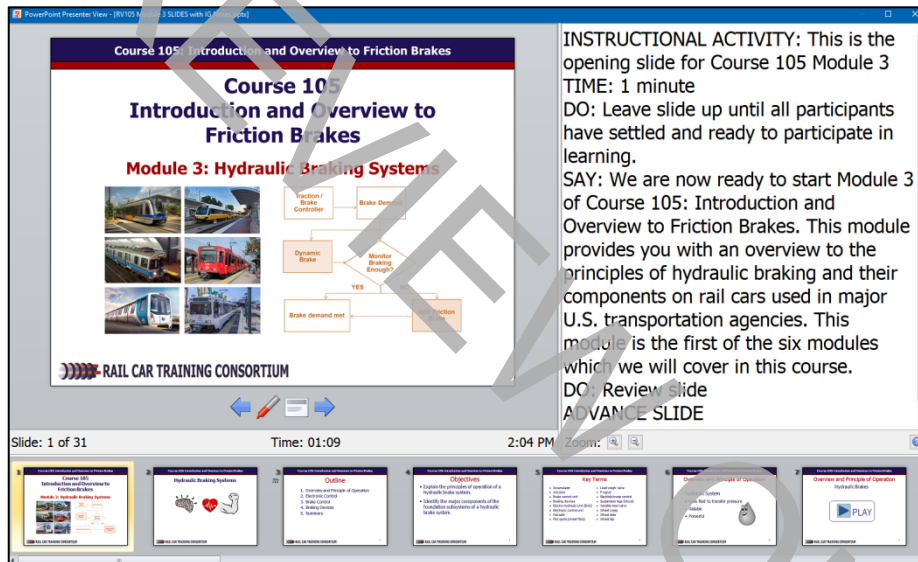
4. If you prefer printed instructor notes below each slide, you can create your own notes via PowerPoint's **Create Handouts option**.

5. Some modules of this course may contain **Hands-on Learning Activities**. Use the Recommended Hands-on Learning Activities table in the module guide to select activities that are appropriate for your location, and then use the template provided in the end of this Instructor's Guide to build out details of the activity. Use your location's Standard Operating Procedures, Job Cards, or OEM Maintenance Manuals as a reference for the safety precautions, equipment/tools/materials needed, and tasks. Review and rehearse all hands-on demonstrations.

6. Make sure that embedded links to videos work.

7. Arrive at least an hour early on class day. Give yourself plenty of time to get organized before the participants arrive.

8. Circulate the Attendance Sign-in Sheet each day and make sure that all participants sign into the class to mark their attendance.

9. Start on time and stay on track. Always start on time, even if only one participant is in the room. Keep exercises within the time limit written in the Power Point presentation.

10. End discussions when they cease to be productive to the learning objectives of the module. Lead participants away from digressions and tangents and focus their attention back to the lesson.

11. Be available for questions during breaks, after class, and during the lab or hands-on learning activities.

12. Mentor participants during each Module activity. Walk amongst the groups in class and during the labs as participants work on activities, and answer questions and offer guidance as appropriate. Ensure that participants are on track as they work. Give constructive feedback during the presentations and participant activities.

13. Review Questions: Review the content of each lesson throughout the course to reinforce the learning outcomes for that lesson and connect the upcoming material. Avoid YES or NO questions and try to use open-ended questions to draw participants into the material. Sample the review questions that are available in the Instructor's Guide and feel free to develop additional questions, as appropriate. Make sure that all questions directly relate to and support the learning outcomes for the Module.

14. Learning Objectives: At the beginning of each Module, review that Module's learning outcomes. Make sure participants are fully aware of the topics in the Module. At the end of each Module, review the outcomes again and use the review questions or an activity/exercise to ensure the outcomes were met.

Course Description

This course presents an introduction to microprocessors for signal maintainers. This introduction will include basic terminology; regulations and oversight specific to microprocessors; common components; common types of microprocessors; inspection, maintenance, and testing; and troubleshooting and repair. Content is supplemented with examples to support participants' successful application of the course to their work.

This course has five modules. The course instructor may choose to use one or both of these modules depending on their training needs.

Within each course module there may be several learning application activities and demonstrations. Before starting the module instruction, participants are expected to complete a **pre-course assessment** to assess their knowledge of the subject. Similarly, after instruction of all the modules, participants will complete a **post-course assessment** as well as a course evaluation.

A breakdown of course components with approximate times are:

Pre-course (0.5 hours)

1. Overview (2.25 hours)
2. Microprocessors in Signal Systems (2.5 hours)
3. Architecture and User Interaction (3 hours)
4. Inspection Maintenance and Testing (0.75 hours)
5. Troubleshooting and Repair (1 hours)

Post-course (0.75 hours)