AORSI Instructor Guide

Course Title: Tire Science, Terrain Matching & Emergency Repair (TIRE)

Duration: 4 Hours (classroom + lab)

Audience: Off-road operators, recovery teams, and instructors

Course Overview

This course covers the science and practical considerations of tires, wheels, and alternative track systems. Students learn how to select, maintain, and repair tires for varied conditions, as well as when alternative traction systems are appropriate. Topics include tire anatomy, terrain suitability, pressure management, and emergency repair techniques.■171†source■

Learning Objectives (Instructor Notes)

- Understand tire construction, tread types, and load ratings. (Tip: Show real tire samples).

- Learn how air pressure impacts traction and performance. (Tip: Demonstrate pressure adjustments).

- Perform proper tire repair and wheel alignment procedures. (Tip: Run a plug/patch exercise).

- Evaluate when tracks or specialty tires are necessary. (Tip: Display specialty tires and track systems).

Module 1: Tire Anatomy & Ratings (Load, Ply, Speed) (1 hr)

- Teach tread, sidewalls, ply, beads, and ratings.

- Course Design Suggestion: Decode ratings from spec sheets.

- Exercise: Identify load and ply rating of a sample tire.

- Reflection: Why are load ratings critical for heavy gear loads?■171†source■

Module 2: Terrain Matching – Mud, Sand, Rock, Snow (1 hr)

- Teach tread differences for mud, sand, rock, snow.

- Course Design Suggestion: Team activity recommending tires for scenarios.

- Exercise: Match tread samples to terrains.

- Reflection: How does mismatching tires increase recovery risk?■171†source■

Module 3: Tire Pressure Management (TPMS, Beadlocks) (1 hr)

- Teach pressure adjustments, TPMS, beadlocks.
- Course Design Suggestion: Practice deflation/inflation drills.
- Exercise: Record recommended pressures for terrains.
- Reflection: Why are beadlocks recommended for experienced operators?■171†source■

Module 4: Tracks, Specialty Setups & Emergency Repair (1 hr)

- Teach track systems, run-flats, emergency repairs.
- Course Design Suggestion: Lab repairing punctured tires.
- Exercise: List advantages/disadvantages of tracks vs tires.
- Reflection: Why is practicing repair essential before field use?■171†source■

Instructor–Student Alignment Chart

This chart aligns instructor activities with student workbook exercises for easy reference.■171†source■

Module	Instructor Focus	Student Workbook Activity
1: Tire Anatomy	Show tire samples and decode ratings	Identify load/ply ratings■171†source■
2: Terrain Matching	Demonstrate tread differences for terrains	Match treads to terrain scenarios■171†source■
3: Tire Pressure	Demonstrate inflation/deflation with tools	Record recommended pressures■171†source■
4: Tracks & Repair	Showcase tracks/run-flats and repair demo	Perform repair drill and list pros/cons■171†source■

Final Assessment

Task: Students complete tire rating quiz, match tread to terrain, and perform a repair drill with plug kits. Written exam questions may include:■171†source■

- What does a tire’s ply rating indicate?
- Which tire type provides best performance in sand, and why?
- How does lowering air pressure improve traction in rocks?
- What are the risks of operating at extremely low pressures?
- Why are track systems not practical for all users?

Instructor Preparation Checklist

- Collect tire samples with different ratings and tread patterns.
- Prepare compressors, deflators, and beadlock examples.
- Set up punctured tires for repair labs.
- Provide diagrams or examples of track systems.

Suggested Timing

- Introduction – 10 min
- Module 1 – 60 min
- Module 2 – 60 min
- Module 3 – 60 min
- Module 4 – 60 min
- Final Assessment – 30 min
- Wrap-up & Questions – 10 min