Course Information Form (CIF)

Course Code: AFD 297

Course Title: Motorsport Concepts and Vehicle Preparation

Department: Applied Sciences and Technologies
PCS Code: 1.2 - Occupational/Technical Instruction
CIP Code: 47.0604
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 3-2-4
Credit Hour Distribution:

Lecture: 3	Lab: 2	Clinical: 0	**Total: 4**

General Course Information

Catalog Description

Introduction to proper motorsport vehicle maintenance, repair, and basic chassis tuning according to specifications set by, but not limited to, the National Hot Rod Association (NHRA), International Hot Rod Association (IHRA), United Midwestern Promoters (UMP), International Motor Contest Association (IMCA), and Sports Car Club of America (SCCA).

General Course Objectives

- Students will participate in motorsport activities, motorsport vehicle racing preparation, maintenance and repair, and basic chassis tuning.
- Students will develop organizational awareness and learn various standards to reflect the rules and regulations set forth by the NHRA, IHRA, UMP, IMCA, and SCCA.

Minimum Placement Levels

English	Reading	Math
Placement into ENG 098	Placement into CCS 098	Placement into MAT 060

Prerequisites

None

Methods of Evaluation

The minimum number of evaluation methods will include: 3 quizzes; 1 lab practical; 1 group project; 1 paper on motorsport team structure, organization, and rules; 1 project on motorsport vehicle system maintenance; and 1 project on motorsport vehicle adjustments and handling.

Instructional Materials and Additional Supplies

My Automotive Lab, with Pearson E-Text access card for Automotive Technology (5). Halderman, Pearson 2016. 0133995542

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.
- Technology: Students will demonstrate the ability to evaluate, select, and appropriately use current and emerging tools.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Motorsport Organizations	1. Describe various types of motorsport organizations, both professional and not-for-profit. 2. Describe the typical order of events during competitions. 3. Describe the difference between regional, national, and professional racing series. 4. Describe typical awards for racing series, both points and monetary systems. 5. Describe sponsorship relationships. 6. Develop a business plan for sponsorship of a motorsport activity.	4	0	0
Team Structure and Work Ethic	1. Describe various motorsport volunteer opportunities. 2. Describe various paid motorsport positions. 3. Describe motorsport team structure, and the importance of a complete understanding of the role each member contributes.	3	0	0
Motorsport Vehicle Transport	1. Describe legal requirements for transport of motorsport vehicles, fuels, and other potentially hazardous materials as regulated by the Department of Transportation (DOT). 2. Demonstrate proper loading and securing of motorsport vehicle for transport. 3. Describe and demonstrate proper towing connections for vehicle and trailer, including brakes, lights, and safety chains. 4. Demonstrate proper unloading of motorsport vehicle after transport.	3	2	0
Motorsport Support Vehicle	1. Describe support vehicle requirements. 2. Formulate a plan to maintain support vehicle organization and replenishment of supplies and spare parts. 3. Evaluate plan effectiveness. 4. Demonstrate the importance of properly organized tools and supplies. 5. Devise a motorsport support vehicle supply checklist per industry requirements.	3	2	0
Motorsport Vehicle Suspension	1. Contrast typical suspension types used for motorsport vehicles. 2. Locate suspension pivot points. 3. Identify damaged suspension components and pivot points. 4. Describe proper repair or replacement procedures for damaged or worn components.	3	2	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Motorsport Vehicle Driveline	1. Describe typical motorsport driveline arrangements and construction. 2. Identify worn or damaged driveline components. 3. Evaluate proper repair options of worn or damaged driveline components. 4. Measure driveline runout. 5. Measure and adjust driveline pinion angle. 6. Describe various types of wheel bearings used for motorsport vehicles. 7. Demonstrate ability to remove, clean, inspect, and replace wheel bearings compared to industry standard.	3	2	0
Motorsport Vehicle Engines	1. Analyze the differences between motorsport vehicle cooling and lubricating systems to those used in passenger car systems. 2. Describe routine engine maintenance requirements based on organization requirements and type of event. 3. Demonstrate cleaning requirements for radiators, oil coolers, filters, and brake duct work. 4. Perform basic engine testing to assess wear and prevent failure through spark plug analysis, valve lash measurement, compression testing, cylinder leakage, and oil analysis. 5. Inspect and replace timing belt.	4	4	0
Motorsport Vehicle Dynamics	1. Describe physics of vehicle motion. 2. Calculate vehicle roll center. 3. Measure vehicle center of gravity. 4. Calculate vehicle instant center. 5. Demonstrate use of multiple scales to measure vehicle weight transfer and cross weight. 6. Analyze effect of weight placement changes. 7. Measure vehicle ride height. 8. Demonstrate and predict effect of ride height changes on corner weight. 9. List the factors that change vehicle dynamics during a normal racing event.	4	2	0
Motorsport Vehicle Body and Sheet Metal	1. Describe proper location for securing sheet metal panels. 2. Describe safety and durability concerns in selection of sheet metal panels. 3. Analyze proper installation of roll cage, door bars, bumpers, seat, and restraint systems in accordance with specific organization rules based on type of racing event and classification. 4. Demonstrate the ability to locate, remove, repair, or replace damaged body panel. 5. Demonstrate how to properly install vehicle instrumentation, warning, and control systems for logical use by the driver.	2	4	0
Motorsport Vehicle Tires and Alignment	1. Describe various tire types and requirements. 2. Demonstrate methods to inspect and repair racing tires. 3. Describe alignment procedures and alignment angles for motorsport vehicles. 4. Demonstrate how to measure caster camber toe, bump steer, Ackerman angle, thrust angle, set back, and offset.	3	4	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Motorsport Vehicle Tuning and Recordkeeping	1. Describe typical handling concerns for motorsport vehicles based on driver feedback. 2. Describe typical suspension adjustments used to change vehicle handling characteristics. 3. Describe importance of systematic plan for making changes and how to properly document changes made. 4. Demonstrate ability to identify motorsport vehicle handling concerns. 5. Report and record results of changes and the effect of these changes.	7	4	0
Chassis Dynamometer	1. Describe how a chassis dynamometer is used to support the Motorsport industry. 2. Explain the difference between typical styles of chassis dynamometer systems. 3. Demonstrate how to secure a vehicle to a chassis dynamometer and the operation of venting systems. 4. Demonstrate how to use dynamometer control systems.	6	4	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
45	30	0