

COURSE SYLLABUS

Suspension & Steering Systems – AUMT 1316-345

Semester/Year: Fall 2025

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Office Hours: by appointment

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Course Description

In this course, you'll learn how suspension and steering systems work, how to diagnose problems, and how to make repairs. We'll cover everything from shocks and struts to alignment, tire balancing, and electronic steering systems. You'll get hands-on shop time and learn skills that are useful both in the industry and as a driver.

Course Goals/Objectives: Utilizing appropriate safety procedures, the student will identify and diagnose system components ; repair or replace system components; perform two and four wheel alignments

SCANS and Foundation Skills: Specific SCANS competencies and foundation skills applicable to this course are listed adjacent to each objective in the course objective table. They include: Foundation Skills (F): 1,2,3,5,6,8,9,10,11,12. Competencies(C): 5,6,7,11,14,15,16,17,18,19,20. A complete list of SCANS competencies and foundation skills is attached at the end of this syllabus.

Verification of Workplace Competencies-Technical Education Division. The learning outcomes of this course will prepare the student to meet the competencies measured in a comprehensive elective course experience (Course #s AUMT 1366 , or AUMT 2366). In addition the student will also be prepared to take the ASE Student Certification test for Steering and Suspension Systems.

SPECIFIC COURSE/INSTRUCTOR REQUIREMENTS

Textbook & Other Required Materials: Ford Training Website – See assignment page

8 ½ x 11 notebook for classroom note taking and assignments

Clear Safety Glasses.

Grading

- **Attendance & Participation – 20%**

Attendance is part of your grade. You need to be in class, on time, and ready to work. Missing class means missing valuable shop time and will impact your grade.

- **Labs & Hands-On Work – 40%**

- **Quizzes & Assignments – 20%**

- **Final Project & Exams – 20%**

Grading Scale:

A = 100–90 | B = 89–80 | C = 79–70 | F = 69 or below

(You must earn at least a C to pass this course for certificate credit.)

Academic Integrity

Do your own work. Turning in work that isn't yours, copying answers, or cheating in any way will result in a zero and could mean failing the course.

Assignment Policy:

Assignments are expected to be completed by the start of class on the posted due date unless your instructor gives different instructions. Assignments may include online or paper-based work such as review questions, short responses, or definitions. Some work will be completed through our online curriculum—make sure you log in at the start of the semester so you can keep up.

Because high school schedules can change, deadlines may be reviewed and adjusted when necessary. Your instructor will do their best to let you know of any changes, but it's your responsibility to stay informed and complete all assignments on time. Always check in with your instructor if you're unsure about a due date.

Student Conduct & Safety Rules

You're expected to follow the behavior guidelines in the college catalog and student handbook. Breaking these rules can lead to immediate disciplinary action.

- **No tobacco, vaping, or chewing products** are allowed in the building or outside the back shop doors.
 - **No food or drinks** in the classroom, lab, or shop
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Dress Code:

The shop is a hands-on environment, so safety comes first.

- **No flip-flops or open-toed shoes**—wear sturdy, protective footwear. Leather work boots are recommended.
- **Pants or jeans must fit at the waist** and be secured with a belt—no sagging.
- **Safety glasses must be worn** at all times in the shop.

If you don't follow the dress code, you'll be sent home and counted absent for the day.

Weekly Schedule

Unit 1: Fundamentals of Suspension & Steering

Week 1 – Welcome & Safety First

Course intro, shop safety, PPE, lifts, jack stands, tool use, safety contract.

Week 2 – Suspension System Basics

Dependent vs. independent suspension, springs, shocks, struts, control arms, shop walkaround.

Week 3 – Steering System Basics

Manual, hydraulic, and power steering systems, rack & pinion vs. recirculating ball, inspection.

Unit 2: Diagnosis & Component Repair

Week 4 – Diagnosing Common Issues

Tire wear, pulling, steering looseness, ride complaints.

Week 5 – Suspension Component Service

Ball joints, bushings, strut mounts, removal/installation.

Week 6 – Steering Linkage Service

Tie rods, idler/pitman arms, steering gear.

Unit 3: Electronic Steering & Suspension

Week 7 – Intro to Electronic Systems

EPS vs. hydraulic, sensors, control modules.

Week 8 – Electronic Diagnostics

Diagnostic charts, codes, scan tools, freeze frame data.

Week 9 – Servicing Electronic Components

Replacing sensors, recalibration, realignment.

Unit 4: Wheel Alignment & Balancing

Week 11 – Alignment Equipment

Using alignment machines, setup, measuring.

Week 13 – Tire Inspection & Rotation

Tread depth, sidewall damage, TPMS overview.

Week 10 – Wheel Alignment Theory

Toe, camber, caster, thrust angle, interpreting printouts.

Week 12 – Tire Balancing & Ride Vibration

Static/dynamic balancing, road force variation.

Unit 5: Tire & Wheel Service + Final Project

Week 14 – Tire Repair & Replacement

Plug/patch procedures, mounting/dismounting, torque specs.

Week 15 – Final Project: Diagnosis + Repair Plan

Full diagnostic report, group presentation.

Week 16 – Final Exam & Skills Check

Written and hands-on exam, exit survey.

Course Objectives

	Course Objectives: Upon completion of this course, you should be able to:	
F1,2,5,6,9,12	<ul style="list-style-type: none"> • Discuss the function of steering and suspension systems. 	C5,6,7,15
F1,2,5	<ul style="list-style-type: none"> • Explain why it is important to maintain proper alignment of the steering system. 	C5,6,7,15
F1,2,5,12	<ul style="list-style-type: none"> • Understand the need for safety during repair and practice safe working habits. 	C5,7
F1,2,5,8-10,12	<ul style="list-style-type: none"> • Use service manuals and manufacturers' specifications to properly complete steering and suspension tasks. 	C5-7,15,18-20
F1,2,5,8-12	<ul style="list-style-type: none"> • Diagnose problems associated with both the steering and suspension systems. 	C5-7,15,18-20
F1,2,5,8-12	<ul style="list-style-type: none"> • Discuss and demonstrate how alignments are performed. 	C5-7,15,18-20
F1,2,5,8-12	<ul style="list-style-type: none"> • Name the components of the steering and suspension systems and discuss the purpose of each. 	C5-7,15,18-20
F1,2,5,9,12	<ul style="list-style-type: none"> • Discuss special handling requirements for towing, jacking, and lifting. 	C5,7,15
F1,2,5,8		C5,7
	Content Outline: Unit I: Introduction to Under car Systems Unit Objectives: Upon completion of this unit, you will be able to:	

	<ul style="list-style-type: none"> • Discuss the functions of steering and suspension systems. • Explain the importance of maintaining proper wheel alignment. • Discuss shop safeties factors, and follow safe working procedures. 	C5,7,15
F1,2,5,6,10	<ul style="list-style-type: none"> • Discuss the different types of lubricants used in steering and suspension systems. 	C5,7,15
F1,2,5,6		C5,7,15
F1,2,5,6	<ul style="list-style-type: none"> • Discuss the different types of seals and their uses. 	
F1,2,5,6	<ul style="list-style-type: none"> • Discuss the different types of bearings and their uses. 	C5,7,15
	<ul style="list-style-type: none"> • Inspect and replace wheel bearings. 	C5,7,15
F1,2,5,6	<ul style="list-style-type: none"> • Inspect and replace wheel-bearing seals. 	C5,7,15
F1,2,5,6		*C5,7,15,16,
F1,2,5,6,8,9,12	<ul style="list-style-type: none"> • Inspect and replace axle seals. 	19,20
F1,2,5,6,8,9,12	<ul style="list-style-type: none"> • Discuss the axes of movement. 	C5,7,15
	<ul style="list-style-type: none"> • Discuss over steer and under steer. 	*
F1,2,5,6,8,9,12		C5,7,15
F1,2,5,6		
F1,2,5,6		

SCANS COMPETENCIES

- C-1 **TIME** - Selects goal - relevant activities, ranks them, allocates time, prepares and follows schedules.
- C-2 **MONEY** - Uses or prepares budgets, makes forecasts, keeps records and makes adjustments to meet objectives.

- C-3 **MATERIALS AND FACILITIES** - Acquires, stores, allocates, and uses materials or space efficiently.
- C-4 **HUMAN RESOURCES** - Assesses skills and distributes work accordingly, evaluates performances and provides feedback.

INFORMATION - Acquires and Uses Information

- C-5 Acquires and evaluates information.
- C-6 Organizes and maintains information.
- C-7 Interprets and communicates information.
- C-8 Uses computers to process information.

INTERPERSONAL—Works With Others

- C-9 Participates as members of a team and contributes to group effort.
- C-10 Teaches others new skills.
- C-11 Serves Clients/Customers—works to satisfy customer’s expectations.
- C-12 Exercises Leadership—communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.
- C-13 Negotiates—works toward agreements involving exchanges of resources; resolves divergent interests.
- C-14 Works With Diversity—works well with men and women from diverse backgrounds.

SYSTEMS—Understands Complex Interrelationships

- C-15 Understands Systems—knows how social, organizational, and technological systems work and operates effectively with them.
- C-16 Monitors and Corrects Performance—distinguishes trends, predicts impacts on system operations, diagnoses systems performance and corrects malfunctions.
- C-17 Improves or Designs Systems—suggests modifications to existing systems and develops new or alternative systems to improve performance.

TECHNOLOGY—Works With a Variety of Technologies

- C-18 Selects Technology—chooses procedures, tools, or equipment, including computers and related technologies.
- C-19 Applies Technology to Task—understands overall intent and proper procedures for setup and operation of equipment.
 - C-20 Maintains and Troubleshoots Equipment—prevents, identifies, or solves problems with equipment, including computers and other technologies.

FOUNDATION SKILLS

BASIC SKILLS—Reads, Writes, Performs Arithmetic and Mathematical Operations, Listens and Speaks

- F-1 Reading—locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.
- F-2 Writing—communicates thoughts, ideas, information and messages in writing and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.
- F-3 Arithmetic—performs basic computations; uses basic numerical concepts such as whole numbers, etc.
- F-4 Mathematics—approaches practical problems by choosing appropriately from a variety of mathematical techniques.
- F-5 Listening—receives, attends to, interprets, and responds to verbal messages and other cues.
- F-6 Speaking—organizes ideas and communicates orally.

THINKING SKILLS—Thinks Creatively, Makes Decisions, Solves Problems, Visualizes and Knows How to Learn and Reason

- F-7 Creative Thinking—generates new ideas.
- F-8 Decision-Making—specifies goals and constraints, generates alternatives, considers risks, evaluates and chooses best alternative.
- F-9 Problem Solving—recognizes problems, devises and implements plan of action.
- F-10 Seeing Things in the Mind's Eye—organizes and processes symbols, pictures, graphs, objects, and other information.
- F-11 Knowing How to Learn—uses efficient learning techniques to acquire and apply new knowledge and skills.
- F-12 Reasoning—discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

PERSONAL QUALITIES–Displays Responsibility, Self-Esteem, Sociability, Self-Management, Integrity and Honesty

- F-13 Responsibility–exerts a high level of effort and perseveres towards goal attainment.
- F-14 Self-Esteem–believes in own self-worth and maintains a positive view of self.
- F-15 Sociability–demonstrates understanding, friendliness, adaptability, empathy and politeness in group settings.
- F-16 Self-Management–assesses self accurately, sets personal goals, monitors progress and exhibits self-control.
- F-17 Integrity/Honesty–chooses ethical courses of action.