Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: CRT
Course and Section #: 2450-001
Course Title: Bags, Brakes, and Steering
Credits: between 1 and 3

Course Description

Teaches the operation and repair of active and passive restraint systems. Diagnosis of sensors, modules and related components is also discussed. Discusses drum, disc, and anti-lock brake systems and components. Covers parallelogram, and rack and pinion steering systems, repair, replacement and diagnosis of each system is addressed. Uses Advanced Tech I-CAR curriculum.

Course Attributes

This course has the following attributes:
☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☐ Elective Core Requirements in Program
☐ Open Elective
Other: *Click here to enter text.*

Instructor Information

Instructor Name: Terrance Orr

Student Learning Outcomes

The student after successful completion of the Bags/Brakes/Steering class should:
Complete STE02 – Suspension Systems 02
Complete STE03 – Suspension Systems 03
Complete DAM 11 – Restraint System Damage Analysis
Complete RES01 – Restraints 01
Complete RES02 – Restraints 02
Complete ABR01 – Advanced Braking

Course Materials and Texts

Collision Repair and Refinishing, Thomas & Judd, 2010

Course Requirements

Course Assignments, Assessments, and Grading Policy

Overall Grading Standards:
A 95%+ A- 92-94% B+ 89-91% B 86-88% B- 83-85% C+ 80-82%
C 77-79% C- 74-76% D+ 71-73% D 68-70% D- 65-67% F >65%
Grading Categories:
There are two grading categories that make up the overall grade. Each category has a different weighted value. The greater the categories weight the greater influence it has on the overall grade. The categories are as follows.
Class Work: (50%) Class work is determined by the average of scores from:
Class Assignments
Tests
Papers

Employable Skills: (50%) Employable skills are determined by the average of scores from:
Quality of Work
Personal Habits – Attendance and Punctuality
Attitude

Required or Recommended Reading Assignments
Chapters from book

General Description of the Subject Matter of Each Lecture or Discussion
Each course in Collision Repair has specific learning objectives. This requires that to complete each course, specific hands on tasks must be completed to both a quality and time standard. Once the basic skill requirements have been met students may chose to work on their own project or on provided in-shop projects. The classes are arranged in a specific order to teach the required sequence and steps necessary so ***projects must meet the modules task requirement***

NATEF Task List:
ABR01 & BRA01
Brakes 01.Inspect brake lines and fittings for leaks, dents, kinks, rust, cracks or wear; tighten loose fittings and supports; replace brake lines (double flare and ISO types), fittings, and supports. HP-I 02.Inspect flexible brake hoses for leaks, kinks, cracks, bulging or wear; remove and replace hoses; tighten loose fittings and supports. HP-I 03.Identify, handle, store, and install appropriate brake fluids; dispose of in accordance with federal, state, and local regulations. HP-G 04.Bleed (manual, pressure, vacuum or surge) hydraulic brake system. HPI 06.Adjust brake shoes; remove and reinstall brake drums or drum/hub assemblies and wheel bearings. HP-I 07.Reinstall wheel and torque lug nuts. HP-I 08.Remove and reinstall caliper assembly. HP-I 09.Clean and inspect caliper mountings for wear and damage. HP-I 10.Check parking brake system operation. HP-I 13.Identify the proper procedures for handling brake dust. HP-G 14.Check for bent or damaged brake system components. HP-G
DAM 11, RES01
Restraint Systems 02.Inspect, remove, and replace seatbelt and shoulder harness assembly and components. HP-G 03.Inspect restraint system mounting areas for damage; repair as needed. HPG 04.Verify proper operation of seatbelt. HP-G 05.Deactivate and reactivate Supplemental Restraint System (SRS). HP-G 06.Inspect, remove, and replace Supplemental Restraint System (SRS) sensors and wiring; ensure sensor orientation. HP-G 07.Verify that Supplemental Restraint System (SRS) is operational. HP-I 08.Inspect, remove, replace and dispose of deployed and non-deployed airbag (s) and pretensioners. HP-G 01.Identify

and perform vehicle manufacturer's recommended procedures for inspecting or replacing restraint systems and components. HP-I 09.Use Diagnostic Trouble Codes (DTC) to diagnose and repair the Supplemental Restraint System (SRS). HP-G

STE02, STE03

Suspension and Steering 01.Identify one-time use fasteners. HP-I 11.Inspect, remove, and replace upper and lower control arms. HP-G 12.Inspect, remove, and replace upper and lower control arm bushings, shafts, and rebound bumpers. HP-G 13.Inspect, remove, and replace upper and lower ball joints. HP-G 14.Inspect, remove, and replace steering knuckle/spindle/hub assemblies (including bearings, races, seals, etc.). HP-G 15.Inspect, remove, and replace front suspension system coil springs and spring insulators (silencers). HP-G 16.Inspect, remove, replace, and adjust suspension system torsion bars, and inspect mounts. HP-G 17.Inspect, remove, and replace stabilizer bar bushings, brackets, and links. HPG 18.Inspect, remove, and replace MacPherson strut cartridge or assembly, upper bearing, and mount. HP-G 19.Inspect,

remove, and replace rear suspension system transverse links, control arms, stabilizer bars, bushings, and mounts. HP-G 20.Inspect, remove, and replace suspension system leaf spring(s), leaf spring insulators (silencers), shackles, brackets, bushings, and mounts. HP-G 21.Inspect axle assembly for damage and misalignment. HP-G 22.Inspect, remove, and replace shock absorbers. HP-G 30.Diagnose non-MacPherson front and rear suspension system noises and body sway problems; determine needed repairs. HP-G 31.Diagnose MacPherson strut suspension system noises and body sway problems; determine needed repairs. HP-G 39.Identify SAI (steering axis inclination), included angle, and KPI (king pin inclination) related problems; determine needed repairs. HP-I

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR A.Frame Inspection and Repair 11.Align or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems. HP-G **B.Unibody Inspection, Measurement, and Repair** 04.Determine and inspect the locations of all suspension, steering, and powertrain component attaching points on the vehicle. HP-G 02.Realign or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and chassis alignment problems. HP-G**III. MECHANICAL AND ELECTRICAL COMPONENTS A.Suspension and Steering** 02.Remove, replace, inspect, or adjust power steering pump, pulleys, belts, hoses, fittings, and pump mounts. HP-G 03.Remove and replace power steering gear (non-rack and pinion type). HPG 04.Remove and replace power rack and pinion steering gear;inspect and replace mounting bushings, tie rod ends, bellow boots, and brackets;ensure proper mounting location. HPG 05.Inspect and adjust (where applicable) steering linkage geometry (attitude/parallelism). HP-G 06.Inspect and replace pitman arm. HP-G 07.Inspect and replace relay (center link/intermediate) rod. HP-G 08.Inspect, remove, and replace idler arm and mountings. HP-G 09.Inspect, remove, and replace tie rod sleeves, clamps, and tie rod ends. HPG 10.Inspect, remove, and replace steering linkage damper. HP-G 26.Diagnose steering column damage, looseness, and binding problems (including tilt mechanisms);determine needed repairs. HP-G 27.Inspect, remove, and replace steering shaft U-joint(s), flexible coupling(s), collapsible columns, and steering wheels. HP-G 28.Diagnose manual and power steering gear (non-rack and pinion type) noises, binding, uneven turning effort, looseness, hard steering, and fluid leakage problems;determine needed repairs. HP-G 29.Diagnose power rack and pinion steering gear noises, vibration, looseness, hard steering, and fluid leakage problems, ensure proper mounting location;determine needed repairs. HPG

Required Course Syllabus Statements

Generative AI

*Click here to enter text.*AI programs are not a replacement for your human creativity, originality, and critical thinking. Writing, thinking, and researching are crafts that you must develop over time to develop your own individual voice. At the same time, you should learn how to use AI and in what instances AI can be helpful to you.
The use of generative AI tools (e.g. ChatGPT, Google Bard, etc.) is permitted in this course for the following activities:

- Brainstorming and refining your ideas;
- Fine tuning your research questions;
- Finding information on your topic;
- Drafting an outline to organize your thoughts; and
- Checking grammar and style.

The use of generative AI tools is not permitted in this course for the following activities:

- Impersonating you in classroom contexts, such as by using the tool to compose discussion board prompts/responses assigned to you or content that you put into a Teams/Canvas chat.
- Completing group work that your group has assigned to you, unless it is mutually agreed upon that you may utilize the tool.
- Writing a draft of a writing assignment.
- Writing entire sentences, paragraphs or papers to complete class assignments.

You are responsible for the information you submit based on an AI query (for instance, that it does not violate intellectual property laws, or contain misinformation or unethical content). Your use of AI tools must be properly documented and cited in order to stay within university policies on academic honesty.
Any student work submitted using AI tools should clearly indicate what work is the student's work and what part is generated by the AI. In such cases, no more than 25% of the student work should be generated by AI. If any part of this is confusing or uncertain, please reach out to me for a conversation before submitting your work.

Using Remote Testing Software
☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity

At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX

Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.
To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.