



Course Title: Tune up/ Engine Performance
Course #: AUT-213

Credit Hours: 4
Semester: Spring 2022
Cap: 10

Faculty: Shanidiin Piechowski-Begay

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Office: Automotive Shop

Office Phone: 435-979-3799

Office Hours (face-to-face or online): 11:30-12:00pm

Preferred Communication (email and/or text; will respond within 24 hours)

Modality (face-to-face, hybrid, or online): Hybrid

Class Location and Meeting Times (if face-to-face): Automotive Shop M/W 1:00-3:00 pm

Meeting Hours and Online Hours (if hybrid): M/W 3:00-3:30pm Zoom

Required Materials: Computer needed: Laptop, desktop or tablet. Face coverings, automotive work shoes/boots, safety eyewear, NTU Automotive work shirt (Long or short sleeve), notebook, pen or pencil, RED pen

Textbooks: CDX Fundamentals of Automotive Technology ONLINE

Tools: Face coverings, automotive work shoes/boots, safety eyewear, NTU Automotive work shirt (Long or short sleeve), notebook, pen or pencil, RED pen

Laptop and Internet Access: Every student is required to own a laptop and have internet access.

Lab Fee (if applicable):

Mission, Vision, and Philosophy

Mission: Navajo Technical University honors Diné culture and language, while educating for the future.

Vision: Navajo Technical University provides an excellent educational experience in a supportive, culturally diverse environment, enabling all community members to grow intellectually, culturally, and economically.

Philosophy: Through the teachings of Nitsáhákees (thinking), Nahátá (planning), Íina (implementing), and Siihasin (reflection), students acquire quality education in diverse fields, while preserving cultural values and gaining economic opportunities.

Course Description

This course will cover conventional and electronic gasoline engine tune-up procedures. Topics will include engine mechanics, fuel systems, ignition systems, and computer systems. Modern engine control system diagnostics and repair procedures pertinent to today's automobile will also be covered. Prerequisite required, AUT 103 Electrical & Electronics.

Course Objectives

After successfully completing this course:

1. Learn to Utilize Mitchel on Demand Shop Service Manual & Management System
2. Be able to identify Engine Performance System internal and external Electrical Parts
3. Work with special Engine Performance System electrical tools and measure equipment
4. Explore Shop Safety and the daily operation of an Automotive Repair Facility
5. Explore Engine Performance System Mechanical and Hydraulic Systems
6. Learn to measure Engine Performance System mechanical and electrical factory specifications

| Course Outcomes | Course Assessments |
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| Explore a career in the Engine Performance system repair field | Complete reading assignments, homework. Assignments, work book Assignment, online internet and classroom examinations, and NATEF Task list projects. |
| Discuss ASE Engine Performance Certification | |
| Discuss use of Engine Performance hand tools. | |
| Discuss the use of Engine Performance system power tools, electrical tools, and specialized equipment. Discuss Automotive Shop Engine Performance system safety practices. | |
| Orientation to Automotive Engine Performance system measurement systems and mathematics. | |
| Documentation of Automotive service repair orders and use of computer systems to achieve this. | |
| Discuss Engine Performance system function and operation. | |

Connections to Program Assessment (Course-Embedded Measures)

Course Activities

| Week | Date | Class Topics/Reading Due | Assignments Due | Assessments |
|------|-----------------|--|-----------------|-------------|
| 1 | Jan 18-21 | Introduction to class, syllabi, and tools. | | |
| | Jan 21 | Last day to add/drop | | |
| 2 | Jan 24-28 | Chapter 65: Intake and Exhaust Systems | Ch 65 Quiz | Ch 65 Quiz |
| 3 | Jan 31-Feb 4 | Chapter 65: Intake and Exhaust Systems | Ch 65 Quiz | Ch 65 Quiz |
| 4 | Feb 7-11 | Chapter 66: Emission Control Systems | Ch 66 Quiz | Ch 66 Quiz |
| 5 | Feb 14-18 | Chapter 66: Emission Control Systems | Ch 66 Quiz | Ch 66 Quiz |
| 6 | Fed 21-25 | NATEF and Chapter review | | |
| | Fed 25 | Graduation Petition due | | |
| 7 | Fed 28-Mar 4 | Chapter 65-66: Review | | |
| 8 | Mar 7-11 | Midterm | | |
| | Mar 11 | Midterm grades due | | |
| 9 | Mar 14-18 | Chapter 67: Alternative Fuel Systems | Ch 67 Quiz | Ch 67 Quiz |
| 10 | Mar 21-25 | Chapter 67: Alternative Fuel Systems | Ch 67 Quiz | Ch 67 Quiz |
| 11 | Mar 31 | Last day to withdraw with "W" | | |
| 11 | Mar 28-Apr 1 | NATEF and Chapter review | | |
| 12 | Apr 4-8 | NATEF and Chapter review | | |
| 13 | Apr 11-15 | NATEF and Chapter review | | |
| 14 | Apr 18-22 | NATEF and Chapter review | | |
| 15 | Apr 25-29 | NATEF and Chapter review | | |
| 16 | May 2-6 | Chapter 65,66, 67: Review | | |

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|----|-----------------|------------------------------------|---------------|--|
| 17 | May 9-12 | Finals | Finals | |
| | May 12 | Grades due to the Registrar | | |
| | May 13 | Graduation | | |
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| AUT 213 Tune-up and Engine Performance | | |
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| Ch.65 | C963 - Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine needed action. | Competency I 1-4 |
| Ch.65 | C962 - Inspect, service, or replace air filters, filter housings, and intake duct work. | |
| Ch.65 | C665 - Verify idle control operation. | |
| Ch.65 | C428 - Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields; perform needed action. | |
| Ch.65 | C429 - Perform exhaust system back-pressure test; determine needed action. | |
| Ch.65 | C424 - Inspect throttle body, air induction system, intake manifold, and gaskets for vacuum leaks and/or unmetered air. | |
| Ch.65 | C869 - Test the operation of turbocharger/supercharger systems; determine needed action. | |
| Ch.65 | C965 - Check and refill diesel exhaust fluid (DEF). | |
| Ch.66 | C432 - Inspect, test, service, and/or replace positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; perform needed action. | |
| Ch.66 | C666 - Diagnose oil leaks, emissions, and driveability concerns caused by the positive crankcase ventilation (PCV) system; determine needed action. | |
| Ch.66 | C843 - Diagnose emissions and driveability concerns caused by the secondary air injection system; inspect, test, repair, and/or replace electrical/electronically-operated components and circuits of secondary air injection systems; determine needed action. | |
| Ch.66 | C714 - Diagnose emission and driveability concerns caused by catalytic converter system; determine needed action. | |
| Ch.66 | C844 - Diagnose emissions and driveability concerns caused by the evaporative emissions control (EVAP) system; determine needed action. | |
| Ch.66 | C391 - Diagnose the cause of excessive oil consumption, coolant consumption, unusual exhaust color, odor, and sound; determine needed action. | |
| Ch.66 | C667 - Diagnose emissions and driveability concerns caused by the exhaust gas recirculation (EGR) system; inspect, test, service, and/or replace electrical/electronic sensors, controls, wiring, tubing, exhaust passages, vacuum/pressure controls, filters, and hoses of exhaust gas recirculation (EGR) systems; determine needed action. | |
| Ch.67 | C900 - Identify service precautions related to service of the internal combustion engine of a hybrid vehicle. | |

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| Ch.67 | C874 - Identify hybrid vehicle auxiliary (12v) battery service, repair and test procedures. |
| Ch.67 | C827 - Identify hybrid vehicle A/C system electrical circuits and the service/safety precautions. |
| Ch.67 | C561 - Identify safety precautions for high voltage systems on electric, hybrid, hybrid-electric, and diesel vehicles. |

Grading Plan

Homework: 10%
 Class Participation: 25%
 NATEF Tasks: 35%
 Quizzes: 10%
 Mid-term: 10%
 Final Exam: 10%

A = 100-90%
 B = 89-80%
 C = 79-70%
 D = 69-60%
 F = 59% or less

Grading Policy

Students must do their own work. Cheating and plagiarism are strictly forbidden. Cheating includes (but is not limited to) plagiarism, submission of work that is not one's own, submission or use of falsified data, unauthorized access to exams or assignments, use of unauthorized material during an exam, or supplying or communicating unauthorized information for assignments or exams.

Participation

Students are expected to attend and participate in all class activities. Points will be given to students who actively participate in class activities including guest speakers, field trips, laboratories, and all other classroom events.

Cell phone and headphone use

Please turn cell phones off **before** coming to class. Cell phone courtesy is essential to quality classroom learning. Headphones must be removed before coming to class.

Attendance Policy

Students are expected to attend all class sessions. If more than ten minutes late, students will be counted as absent. A percentage of the student's grade will be based on class attendance and participation. Absence from class, regardless of the reason, does not relieve the student of responsibility to complete all course work by required deadlines. Furthermore, it is the student's responsibility to obtain notes, handouts, and any other information covered when absent from class and to arrange to make up any in-class assignments or tests if permitted by the instructor. Incomplete or missing assignments will necessarily affect the student's grades. Instructors will report excessive and/or unexplained absences to the Counseling Department for investigation and potential intervention. **Instructors may drop students from the class after three (3) absences unless prior arrangements are made with the instructor to make up work and the instructor deems any excuse acceptable.**

Study Time Outside of Class for Face-to-Face Courses

For every credit hour in class, a student is expected to spend two hours outside of class studying course materials.

Study Time for Hybrid or Blended Courses

For a hybrid or blended course of one credit hour, a student is expected to spend three hours per week studying course materials.

Study Time for Online Courses

For an online course of one credit hour, a student is expected to spend four hours per week studying course materials.

Academic Integrity

Integrity (honesty) is expected of every student in all academic work. The guiding principle of academic integrity is that a student's submitted work must be the student's own. Students who engage in academic dishonesty diminish their education and bring discredit to the University community. Avoid situations likely to compromise academic integrity such as: cheating, facilitating academic dishonesty, and plagiarism; modifying academic work to obtain additional credit in the same class unless approved in advance by the instructor, failure to observe rules of academic integrity established by the instructor. **The use of another person's ideas or work claimed as your own without acknowledging the original source is known as plagiarism and is prohibited.**

Diné Philosophy of Education

The Diné Philosophy of Education (DPE) is incorporated into every class for students to become aware of and to understand the significance of the four Diné philosophical elements, including its affiliation with the four directions, four sacred mountains, the four set of thought processes and so forth: Nitsáhákees, Nahát'á, Íina and Siih Hasin which are essential and relevant to self-identity, respect and wisdom to achieve career goals successfully.

At NTU's Zuni Campus, the A:shiwí Philosophy of Education offers essential elements for helping students develop Indigenous and Western understandings. Yam de bena: dap haydoshna: akkya hon detsemak a:wannikwa da: hon de:tsemak a:ts'umme. *Our language and ceremonies allow our people to maintain strength and knowledge.* A:shiwí core values of hon i:yyułashik'yanna:wa (respect), hon delank'oha:willa:wa (kindness and empathy), hon i:yyayumola:wa (honesty and trustworthiness), and hon kohoł lewuna:wediyahnan, wan hon kela i:tsemanna (think critically) are central to attaining strength and knowledge. They help learners develop positive self-identity, respect, kindness, and critical thinking skills to achieve life goals successfully.

Students with Disabilities

Navajo Technical University is committed to serving all students in a non-discriminatory and accommodating manner. Any student who feels that she or he may need special accommodations should contact the Accommodations Office (<http://www.navajotech.edu/student-services#accomodations-services>) in accordance with the university's Disability Accommodations Policy (see http://www.navajotech.edu/images/about/policiesDocs/Disability_ Exhibit-A_ 6-26-2018.pdf).

Email Address

Students are required to use NTU's email address for all communications with faculty and staff.

Final Exam Date: May 9-12