



Course Title: Tune up/ Engine Performance
Course #: AUT-113

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 8:30-11:30am

Meeting Hours and Online Hours (if hybrid): M/W 8:30-11:30am 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
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 61: Ignition Systems	Ch 61 Quiz	Ch 61 Quiz
3	Jan 31-Feb 4	Chapter 61: Ignition Systems	Ch 61 Quiz	Ch 61 Quiz
4	Feb 7-11	Chapter 62: Gasoline Fuel Systems	Ch 62 Quiz	Ch 62 Quiz
5	Feb 14-18	Chapter 62: Gasoline Fuel Systems	Ch 62 Quiz	Ch 62 Quiz
6	Fed 21-25	NATEF and Chapter review		
	Fed 25	Graduation Petition due		
7	Fed 28-Mar 4	Chapter 61-62: Review		
8	Mar 7-11	Midterm		
	Mar 11	Midterm grades due		
9	Mar 14-18	Chapter 63: Engine Management System	Ch 63 Quiz	Ch 63 Quiz
10	Mar 21-25	Chapter 63: Engine Management System	Ch 63 Quiz	Ch 63 Quiz
11	Mar 31	Last day to withdraw with "W"		
11	Mar 28-Apr 1	Chapter 64: Onboard Diagnostic Systems	Ch 64 Quiz	Ch 64 Quiz
12	Apr 4-8	Chapter 64: Onboard Diagnostic Systems	Ch 64 Quiz	Ch 64 Quiz
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	NATEF and Chapter review		

17	May 9-12	Finals	Finals	
	May 12	Grades due to the Registrar		
	May 13	Graduation		

AUT 113 Tune-up and Engine Performance		
Chapter	Task sheets	Competency 1-4
Ch.61	C841 - Access and use service information to perform step-by-step (troubleshooting) diagnosis.	
Ch.61	C960 - Remove and replace spark plugs; inspect secondary ignition components for wear and damage.	
Ch.61	C387 - Research vehicle service information including vehicle service history, service precautions, and technical service bulletins.	
Ch.61	C663 - Inspect and test crankshaft and camshaft position sensor(s); determine needed action.	
Ch.61	C386 - Identify and interpret engine performance concerns; determine needed action.	
Ch.61	C712 - Diagnose (troubleshoot) ignition system related problems such as no-starting, hard starting, engine misfire, poor drive ability, spark knock, power loss, poor mileage, and emissions concerns; determine needed action.	
Ch.61	C664 - Inspect, test, and/or replace ignition control module, powertrain/engine control module; reprogram/initialize as needed.	
Ch.62	C868 - Inspect and test fuel pump(s) and pump control system for pressure, regulation, and volume; perform needed action.	
Ch.62	C842 - Inspect, test, and/or replace fuel injectors.	
Ch.62	C422 - Replace fuel filter(s) where applicable.	
Ch.62	C420 - Check fuel for contaminants; determine needed action.	
Ch.64	C659 - Retrieve and record diagnostic trouble codes (DTC), OBD monitor status, and freeze frame data; clear codes when applicable.	
Ch.64	C661 - Describe the use of OBD monitors for repair verification.	
Ch.64	C867 - Perform active tests of actuators using a scan tool; determine needed action.	
Ch.64	C668 - Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine needed action.	
Ch.64	C840 - Inspect and test computerized engine control system sensors, powertrain/engine control module (PCM/ECM), actuators, and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO); perform needed action.	
Ch.64	C660 - Diagnose the causes of emissions or drive ability concerns with stored or active diagnostic trouble codes (DTC); obtain, graph, and interpret scan tool data.	
Ch.64	C711 - Diagnose emissions or drive ability concerns without stored or active diagnostic trouble codes; determine needed action.	

Ch.64	C409 - Diagnose drive ability and emissions problems resulting from malfunctions of interrelated systems (cruise control, security alarms, suspension controls, traction controls, HVAC, automatic transmissions, non-OEM-installed accessories, or similar systems); determine needed action.
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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