

Grays Harbor College

AUTOMOTIVE TECHNOLOGY AUTO 113: Engines/Tune-up/Ignition 16 Credits Denis Samson, Instructor

Course syllabus, Spring

Associate in Technology Degree

Prerequisite Requirements:

Placement in Math 60, English 60, and Instructor permission.

<u>Core Courses</u>	<u>Credits</u>
AUTO 111 Brakes / Suspension / Steering	16
AUTO 112 Electrical / Electronics / ABS	16
<u>AUTO 113</u> <u>Engines / Electrical / Tune-up / Ignition</u>	<u>16</u>
AUTO 211 Power Train / Transmissions (Manual and Automatic)	16
AUTO 212 Fuel Systems / Electronic / Computer Controls	16
AUTO 213 Advanced Engine Performance / Air Conditioning / Heating.	16

Credits Required **96**

Support Courses

WELD	101	Related Welding 1	6
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Credits Requires **6**

General Education Courses

ENGL	101	Expository / Argumentative Writing	5
		Or	
ENGL	150	Vocational / Technical / Business Writing	5
MATH	100	Vocational / Technical Math (or higher)	5
PSYCH	100	General Psychology	5
		Or	
PSYCH	106	Applied Psychology	3
		Or	
SOC	101	Introduction to Sociology	5

Credits Required ~~13~~ **15**

Elective Courses

AUTO	224	Work Experience	1-5
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Elective Courses must be approved by the student’s academic advisor at Grays Harbor College

Minimum Credits Required ~~116+~~

3 PE Credits

See Grays Harbor College Catalog or GHC web page at www.ghc.edu for Course Outlines for Automotive Certificate of Completion and Automotive Certificate of Achievement Program.

I. COURSE DESCRIPTION:

Prerequisite: CPT in Math 060 and English 060 and Instructor permission.

The foundation for Automotive Technology provided in this course includes a study of safety rules and procedures, use of shop tools, equipment, engine overall and tune up procedures currently in use by the automotive industry. The student will be introduced to engine construction, valve and camshaft arrangements, cooling systems, and lubrication systems. The student will use applications of engine teardown/reassembly methods, measurement techniques, part wear/failure analysis to make diagnosis of engine systems. Tune-up and troubleshooting with electrical and electronic test equipment will be emphasis. . 8 lecture hours; 16 lab hours. Vocational program course. May be used as a general elective in the AA degree.

II. COURSE OBJECTIVES

To meet the course standards and demonstrate the ability to meet the outcomes expectations of this course (Competency in the discipline (4 CD), Literacy (2 L), Critical Thinking (3 CT), Social and Personal responsibility (4 SP), and Information Used (4 IU)] student will:

Demonstrate employability by following safe work practices, being on time, maintaining proper attendance, and properly following written and oral instruction (SP)

Demonstrate safety and proper work habit (CD, SP)

Meet NATEF competency criteria in the following areas:

- 1) Identify the various components of an engine. Describe how variations in these components affect fuel economy, performance and emissions. (L, IU)
- 2) Demonstrate the ability to use precision measuring tool in determining the condition of a disassembled engine and all the different components of the engine. (CD, L, IU)
- 3) Demonstrate the ability to perform proper diagnostic test (e.g., vacuum tests, cylinder compression tests, and cylinder leak down tests, etc.) to determine engine condition prior to engine teardown. (CD, CT, SP, IU)
- 4) Demonstrate the ability to remove and replace a front wheel drive engine or a rear wheel drive engine safely, and efficiently as described in an appropriate service manual. (CD, SP, IU)
- 5) Demonstrate the ability to take a given component measurement and compare it to the proper specifications to determine the amount of wear. (L, CT)
- 6) Demonstrate-the ability to assemble an engine as outlined in the appropriate service manual and by so doing achieve maximum horsepower, torque, and expected emissions requirements. (CD, L, IU)

III. INSTRUCTIONAL TECHNIQUE

AUTO 111 is taught 4 hours and 5 minutes per day, plus one 15 minute break, Monday – Friday, for a period of about 11 weeks. The methods of instruction will be lecture, discussion, classroom exercises, demonstrations, and lab work. There will be eight hours per week for lecture presentations and sixteen hours per week hands on in the lab/shop experience. Lab/shop work is emphasized with small groups and one to one instruction when possible.

IV. DISABILITES

If you have a documented disability that may interfere with your ability to fully participate in this class, you may be eligible for accommodations. Contact your instructor or the Disability Support Services located on campus in the Student services, room 119. Information regarding any disability will be kept confidential.

V. WORK HABITS

Industry has expressed attendance, punctuality, and general work habits as critically important for success on the job. The standards of this course include industry expectations. If you want to do well, the following will have to occur: show up **every day**, be on time, clean, fed, wide awake and thinking about automotive, with neatly and correctly completed homework ready to turn in. When class starts...participate! Keep safety first. Treat equipment with respect. Be conscientious and considerate of others. Make productive use of the time available. Clean up after yourself. Feel good about yourself, your work, and your progress.

Efficient use of time is vital. The Automotive Competency Lists are designed to require effective time management for successful completion. Just like on the job, you can expect to have to plan out your tasks and periodically work on two or more competencies simultaneously to avoid unnecessary delays waiting for a special tool or for shared equipment.

This is a full-time training program. The main goal is to build technical and workplace skills. The quantity and skill level requirements of the Automotive Competency Lists and homework, combined with the strict enforcement of work habits standards, grading criteria, and shop rules, is intended to maximize your likelihood of success in the industry. Focus, a “can-do” attitude, and prioritization of your education is both expected and necessary in order to be successful.

VI. HOME WORK

Regular Assignments: To be handed in daily.

Processed in Microsoft Word.

Times New Roman, 12 point font, double-spaced, 1 ¼” margins and at least 14 lines in length.

More than **1** mistake or ANY mistake on heading: lose 3 points off your work habits point sheet.

Basic Chapters (1-2-3-4-5-6-7) will be discussed in class.

You will be given a complete homework schedule for the entire quarter.

In case of an absence, all homework that is required will be due from you the day you return.

VII. ATTENDANCE POLICY.

Attendance is graded. There are no excused absences. You are expected to be present every day for the entire quarter. Lost points cannot be made up. If a problem arises that will cause you to miss enough class to fail the course, see admissions to request an official withdrawal.

If you will miss class for some reason, please call or tell a friend or family member to call and leave a message on the shop answering machine by 7:00 a.m. An absence with **prior** notice by 7:00 a.m. of the day absent will score 0 points for the day. An absence **without** prior notice by 7:00 a.m. of the day absent will score -5 for the day.

TARDINESS / LEAVING EARLY

Arriving after 9:30 or leaving before 9:45 is an absence. Whatever the case, notify the Instructor or the Instructor Aid as soon as you arrive or immediately before you leave.

VIII. “A” TEAM

Automotive Technicians earning 3 consecutive “A’s” in the 16 credit core automotive courses will be inducted into the A Team. A Team members will be awarded the coveted gray hat and be included in the annual spring A team photo.

IX. METHOD OF EVALUATION

Students will earn two grades in this course, a work habits point sheet grade, and a shop/competency/participation grade. The **Lower** of the two letter grades earned is the overall grade earned.

Work Habits Points Sheets Grade:

Attendance, Punctuality, and Time Card, Tags,
 Homework Assignments handed in on time, (see work habits point sheet),
 Final Exam (written 10% and practical test 90%) and also chapter exams.

Point Schedule:.....Daily Total5 points

<u>Homework not handed on time</u>	Lose 3 points per day.
<u>Homework with more than 1 mistake</u>	Lose 3 points per day.
<u>Homework with incorrect heading</u>	Lose 3 points per day.
<u>Late Homework not handed in the next day</u>	Lose 3 points per day.
<u>Inaccurately filling time card</u>	Lose 1 point per mistake.
<u>Chapter test below 80%</u>	Lose 3 points
<u>Final Exam below 80%</u>	Lose 1 grade (ex: A to B)
<u>Unauthorized use of a cell phone or texting</u>	Lose 3 points each time.

Shop / Competency / Participation Grade:

Competency completed and signed by you and me. In order to get a competency signed, the work order needs to be completed and closed.
 Correctly complete work orders and include the task with the work order when required by the competency.

This percentage is based on work habits points, and competencies collected during the quarter. The Chapter and Final exams can not be repeated. Students not present for the any exam will be given a zero.

Auto 111	MINIMUM REQUIREMENTS FOR GRADE OF			
	A	B	C	D
Work Habits Points	94%	90%	85%	80%
Competency	90%	80%	70%	70%

****If you have a course grade below C more than once, you will be on probation by the administration.****

Pluses and minus will not be used. In addition, grade will also be lowered by one full letter if you are awarded and accept a local scholarship, but **FAIL** to attend the donor recognition ceremony in the spring: Ex: If you finish the class with “B”, you will get a “C”.

X. CLEAN UP PROCEDURE

Clean up starts when signaled. You may clean up early if you desire, but you will be docked points same as for leaving early.

Final grade computed will be lowered by one full letter if absent on the last day of class (shop clean up day). Arriving late or leaving early is the same as not being here that day.

XI. ATTENDANCE POLICY

NAME: _____

GHC Automotive Technology – WORK HABITS POINT SHEET

Circle present week: 1 2 3 4 5 6 7 8 9 10 11 12

5 points are possible per day. Deduct 3 points for arriving late, leaving early. Deduct 3 points for not turning in completed homework at the time it is collected or if there is more than 1 mistakes or late homework not supplied the next day. Deduct 1 point for inaccurately filling out the time card. 5 points will be deducted (for you) if you are sent home, **inaccurately** record your points for the day, or take an unauthorized break. **An absence is equal to 0 points.** When failing a test 3 point must be deducted even if it mean going below 0. Leaving tag(s) in tool room after returning a tool(s) -1. Points cannot be made up.

Day	Points earned	Explanation if less than 5 points	Tags Tools -1	Test -3	Home work -3	Time card -1	Cell Phone or texting -3
M							
T							
W							
Th							
F							

Total points earned as of last week: _____
 (Monday)

Points earned this week: + _____
 (Friday)

Total points earned to date: = _____ Total points possible _____
 (Friday) Adding wrong cost= **5 points** (Monday)

Total points earned today divided by total points possible = _____ %
 (Friday)

Current work habits letter grade (Friday): _____

	A	B	C	D
Work Habits Point Grade	94%	90%	85%	80%
Competency Point Grade	90%	80%	70%	70%

 Student Signature

 Instructor Signature

XIII. COURSE OUTLINE:

1. COOLING INTERNAL COMBUSTION ENGINES
 - a. Operation
 - b. Components(thermostat)

2. LUBRICATION OF INTERNAL COMBUSTION ENGINES
 - a. Operation
 - b. Components
 - c. Engine Oils
 - d. Diagnose Pressure/Consumption Problems

3. ENGINE REMOVAL
 - a. Rear Wheel Drive
 - b. Front Wheel Drive

4. ENGINE DISASSEMBLE/INSPECT/SERVICE
 - a. Rear Wheel Drive
 - b. Front Wheel Drive

5. ENGINE REASSEMBLE
 - a. Rear Wheel Drive
 - b. Front Wheel Drive

6. CYLINDER HEAD DISASSEMBLE/INSPECT/SERVICE
 - a. Overhead Valve
 - b. Overhead Cam

7. CYLINDER HEAD REASSEMBLE/INSTALL
 - a. Overhead Valve
 - b. Overhead Cam

8. ENGINE REINSTALL IN VEHICLE
 - a. Rear Wheel Drive
 - b. Front Wheel Drive

9. TUNE UP PROCEDURE AND DIAGNOSIS
 - a. Compression check wet and dry
 - b. Diagnosing valve train problem(Timing chain or Timing belt and timing)
 - c. Using multimeter to check spark plug wires
 - d. Interpret spark plug wear pattern.

XIV. INSTRUCTIONAL MATERIALS, SUPPLIES, AND EQUIPMENT:

The student will provide:

1. Textbooks
2. Notebook and composition book for journal
3. Pencils, **pens**, and colored markers as needed
4. Personal hand tools: see required tool list
5. Safety glasses
6. Disposable gloves...nitrile, not latex (latex dissolves easily in the chemicals we use)

XV. TEXTBOOKS: REQUIRED

Various textbooks are used based on current editions of manuals and published textbooks. Please see your instructor for current textbook required.

The instructor will provide:

1. Selections from Service Manuals and Electronic Service Manuals
2. Other handouts as required

Note: Coveralls are supplied to all students (special lab fee).

I have received and read the syllabus for AUTO 113 for Spring Quarter. I acknowledge this by my signature below.

Print Name	Signature	Date
1 _____	_____	_____
2 _____	_____	_____
3 _____	_____	_____
4 _____	_____	_____
5 _____	_____	_____
6 _____	_____	_____
7 _____	_____	_____
8 _____	_____	_____
9 _____	_____	_____
10 _____	_____	_____
11 _____	_____	_____
12 _____	_____	_____
13 _____	_____	_____
14 _____	_____	_____
15 _____	_____	_____
16 _____	_____	_____