

**MARTIN COMMUNITY COLLEGE**  
**COURSE SYLLABUS**  
**Semester/Year: Spring 2011**

<b>COURSE NUMBER:</b>	AUT 110 (01)	<b>INSTRUCTOR:</b>	Mr. R. Swisher
<b>COURSE TITLE:</b>	Intro to Auto Technology	<b>OFFICE NO:</b>	Building 3, Room 7
<b>CREDIT HOURS:</b>	3	<b>OFFICE/VIRTUAL HOURS:</b>	NA
<b>CONTACT HRS/WK:</b>	4 (2 class; 2 lab)	<b>PHONE NO:</b>	252-789-0212
<b>PREREQUISITES:</b>	None	<b>FAX:</b>	252-792-0826
<b>COREQUISITES:</b>	None	<b>E-MAIL:</b>	rswisher@mcc.martincc.edu

**COURSE DESCRIPTION:** This course covers workplace safety, hazardous material and environmental regulations, use of hand tools, service information resources, basic concepts, systems, and terms of automotive technology. Topics include familiarization with vehicle systems along with identification and proper use of various automotive hand and power tools. Upon completion, students should be able to describe safety and environmental procedures, terms associated with automobiles, identify and use basic tools and shop equipment.

**PROGRAM LEARNING OUTCOMES:**

1. Inspect, diagnose, disassemble, repair, replace and service each of the major systems in various types of vehicles to a NATEF standard.
2. Perform with accuracy, dependability, proficiency, and in a timely manner when servicing automotive systems
3. Discuss industry standards and employer/customer expectations for employees in the automotive industry workplace

**COURSE LEARNING OUTCOMES:**

1. Inspect, diagnose, disassemble, repair, replace and service automotive systems in various types of vehicles to a NATEF standard.
2. Perform with accuracy, dependability, proficiency, and in a timely manner when servicing automotive systems
3. Discuss industry standards and employer/customer expectations for employees in the automotive systems repair workplace

**REQUIRED TEXTBOOKS:**

Text: Gilles. (2008) Automotive Service: Inspection Maintenance Repair (3rd ed.): Thompson Delmar. ISBN: 1-4180-3758-3.  
Worktext: Hadfield. (2008) Automotive Job Sheets for NATEF Task Mastery (1st ed.) Clifton Park: Thompson Delmar. ISBN: 1-4180-7302-1

**SUPPLEMENTAL RESOURCES:**

Required Supplies: Approved Safety Glasses  
Basic Tool Set (See Attached)

**NOTE: SAFETY GLASSES ARE REQUIRED TO BE WORN AT ALL TIMES WHILE IN THE SHOP AREA AND IN THE OUTSIDE WORK AREA**

Reference Materials: Information on Shop-Key discs; and videos from manufactures; on new up-date engines.

## **LEARNING/TEACHING METHODS:**

Lecture, VHS tapes, textbooks and various manufacturers' specifications and repair manuals, hands-on lab, outside reading assignments.

## **ASSESSMENTS/METHODS OF EVALUATION:**

1. Chapter Tests
2. Quizzes
3. Lab work (This will be graded on use of time, dependability, quality of work, and cooperation in the lab.)
4. Final Exam

## **GRADING POLICY:**

Grading Plan:

Chapter Tests will be given with a final exam at the end of the semester. Lab work will be graded on use of time, dependability, quality of work and cooperation in the shop.

Final Grade will be determined by:

Tests	20%
Lab	20%
Classroom	20%
Exam	25%
Outside Reading Assignment	15%

Shop grades will be determined on quality of work, dependability, speed and cleanliness and following directions.

A= 90-100    B=80-89    C=70-79    D=60-69    F=59 and Under

## **COURSE OUTLINE:**

Course Topics

### **1. Safety, Environmental, and Industry Regulations**

#### **A. Safety Regulations**

1. Occupational Safety and Health Administration
2. American National Specifications Institute
3. Environmental Protection Agency
4. Local Enforcement

#### **B. Hazardous Waste Handling**

1. Material Safety Data Sheets
2. Proper storage
3. Proper disposal
  - a. Resource conservation and Recovery Act (RCRA)
4. Hazardous waste spill procedures

#### **C. Industry Regulations**

1. National Highway Transportation Safety Administration
2. Society of Automotive Engineers
3. International Standards Organization
4. American Petroleum Institute
5. Environmental Protection Agency

- a. Clean Air Act
- 2. Shop Operations
- A. Employability Skills
- 1. Communication
  - a. Oral
  - b. Written
  - c. Visual
- 2. Work Ethics
- 3. Adaptability
- 4. Information Processing
- 5. Problem Solving
- 6. Responsibility
- 7. Teamwork
- B. Work Orders
- 1. Customer information
- 2. Vehicle identifying information
  - a. VIN
  - b. VECI Label
  - c. Vehicle Safety Certification Label
- 3. Customer concern
- 4. Related service history
- 5. Malfunction cause and correction.
- C. Shop Procedures
- 1. Procedures to bring vehicles in the shop.
- 2. Shop car rules
- 2. Clean up
- 3. Service Information Resources
- A. Computer based service information
- B. Manuals
- C. Technical Service Bulletins
- D. Parts and Labor Guide
- 4. Fasteners
  - A. Bolts and Nuts
    - 1. Bolt strength ID - inch system
    - 2. Bolt strength ID - metric system
    - 3. Threads - English ID
  - 3
    - a. Unified National Course (UNC or NC)
    - b. Unified National Fine (UNF or NF)
    - c. Unified National Pipe Threads (UNPT or NPT)
  - 4. Threads - Metric ID
    - a. System International d'Unites (SI) or International System of Units
    - b. International Standards Organization (ISO)
  - 5. Bolt size
  - 6. Thread pitch
  - 7. Grade
  - 8. Tensile strength
- B. Washers
- C. Screws
- D. Plastic
- E. Other fasteners

- 5. Hand tools
  - A. Location and identification
  - B. Types (frequently used) standard and metric
    - 1. Wrenches
    - 2. Sockets
    - 3. Ratchets
    - 4. Extensions
    - 5. Screwdrivers
    - 6. Chisels and punches
    - 7. Hammers
    - 8. Pullers and accessories
  - 6. Portable power tools
    - A. Impact wrenches-types
      - 1. Air wrenches
      - 2. Electric wrenches
    - B. Drills-types
      - 1. Air powered drills
      - 2. Electric drills
    - C. Power chisels and cutting tools
    - D. Stationary power tools
      - 1. Bench grinder
      - 2. Drill press
      - 3. Hydraulic press
    - 7. Threading and extracting tools
      - A. Taps and dies
      - B. Thread inserts
      - C. Screw/stud extractors
    - 8. Precision Measuring Devices
      - A. Feeler gauges
      - B. Calipers
      - C. Straightedge
      - C. Micrometers
      - D. Dial indicators
      - E. Telescoping and small hole gauges
      - F. Torque wrenches
    - 9. Flaring tools
      - A. Single lap flaring
      - B. Double lap flaring
    - C. ISO
  - 10. Torches
    - 4
    - A. Oxy-Acetylene Basics
      - 1. Cutting
      - 2. Brazing
      - 3. Welding
    - B. MIG Welding (OPTIONAL)
      - 1. Set-up and electrode selection
      - 2. Joints, Lap and butt
  - 11. Chemicals
    - A. Penetrants
    - B. Lubricants

- C. Sealants
  - 1. Aerobic (RTV)
  - 2. Anaerobic
  - 3. Thread
- D. Cleaners
- 12. Automotive Systems
  - A. Engine
    - 1. Gasoline
      - a. Mechanical system
      - b. Fuel system
      - c. Ignition system
      - d. Cooling system
      - e. Electrical system
    - 2. Diesel
      - a. Mechanical system
      - b. Fuel system
      - c. Cooling system
      - d. Electrical system
  - 3. Alternative Fuels
  - B. Drivetrain
    - 1. Clutch
    - 2. Transmission/transaxles
    - 3. Driveline
    - 4. Differential
    - 5. Driving Axles
  - C. Chassis
    - 1. Suspension
    - 2. Steering
    - 3. Brakes
    - 4. Tires and wheels
- 13. Automotive Industry Shop Operations
  - A. Dealership
    - 1. Pay Plans
    - 2. Benefits
    - 3. Functional layout
    - 4. Procedures
    - 5. Training
  - B. Independent Repair Facilities
    - 1. Pay Plans
    - 2. Benefits
    - 3. Functional layout
    - 4. Procedures
    - 5. Training
- OPTIONAL
- 14. Engine Fundamentals
  - 5
    - A. Four Stroke Cycle
      - 1. Intake
      - 2. Compression
      - 3. Power (combustion)
      - 4. Exhaust

5. Cycle completed in two crankshaft revolutions (720°)
- B. Engine Design
  1. Cylinders in-line
  2. V-type
  3. Overhead camshaft(s)
    - a. Drive (chain, gears, or belt)
  4. Valves
    - a. Number of valves per cylinder
  5. Valve timing
    - a. Opening and closing points with reference to crankpin position
    - b. Valve overlap
    - c. Timing marks
    - d. Variable valve timing
  6. Crankshaft and Pistons
    - a. Crankshafts
      1. Crankpin spacing in degrees
      2. Vibration damper purpose
      3. Flywheel purpose
    - b. Pistons and rods
      1. Offset
      2. Assembly markings
    - c. Rings
      1. Compression
      2. Scraper
      3. Oil (3 piece)
    4. Materials
    5. Top-side markings
- C. Starting and Charging Systems
  1. Battery
  2. Starter
    - a. Motor
    - b. Solenoid
  3. Cranking circuit
  4. Alternator
    - a. Charging circuit
- D. Ignition System
  1. Components
  2. Circuits
- E. Cooling and Lubrication Systems
  1. Fluids
  2. Components
  3. Flow

**STUDENT ATTENDANCE POLICY:** Martin Community College recognizes that academic success is tied to regular attendance and completion of assigned work and tasks in a timely manner. Students are expected to attend a minimum of 80 percent of the total hours for a course, which includes classes, labs, and shops. Some courses and programs have stricter attendance requirements of 85, 90, or 95 percent based upon the difficulty and complexity of the subject matter. General Education and Developmental courses require 85 percent attendance. The syllabus for each course will specify the attendance requirement.

Students must be present in at least one class during the first ten percent (10%) of a course in order to be considered enrolled in the class. If a student has not attended at least one class by the ten percent census date, the instructor will administratively withdraw the student.

Students who miss more than six contiguous contact hours or fail to attend the required percentage of total hours without a justifiable absence and verifiable contact with the instructor may be administratively withdrawn from the class by the instructor and given a grade of “WF.” The “WF” will be equivalent to an “F” when calculated into the student’s GPA. The course syllabus will indicate what the instructor considers a justifiable absence and will define “verifiable contact.” Students may remove a “WF” by submitting appropriate paperwork for an official withdrawal by the last day to officially withdraw without receiving an “F.” The last day to officially withdraw without receiving an “F” is published in the academic calendar for each academic year. The official withdrawal date for mini sessions, block courses, or other non-traditional schedules are available from the registrar and will be included on the course syllabus.

Make-up work may be allowed at the discretion of the instructor, and the instructor’s policy on make-up work will be included in the course syllabus. Students in clinical and cooperative educational work experiences must complete 100 percent of the required hours to receive a passing grade. Clinical or cooperative work experience make-up hours require clinical or cooperative educational work site approval and approval of the instructor.

Habitual tardiness and/or early departure in a course may, at the discretion of the instructor, be considered in computing class attendance. The course syllabus will include the instructor’s definition of tardiness and early departure.

Students will be counted absent from the date they register for each course.

Note: Under DVA regulations, the enrollment of veterans or dependents will be terminated or adjusted if they are administratively withdrawn or if they officially withdraw.

If an instructor fails to report for a class within 15 minutes of the scheduled beginning time and has not left instructions, those students present should sign a sheet before leaving and designate a student to submit it to the Dean of Academic Affairs and Student Services

### **REQUEST FOR EXCUSED ABSENCES FOR RELIGIOUS OBSERVANCES\***

**\*In compliance with G.S. 115D-5, MCC policy permits a student to be excused, with the opportunity to make-up any test or other missed work, a minimum of two excused absences per academic year for religious observances required by the student’s faith. The policy limits the excused absences to a maximum of two days per academic year.**

Students who wish to be excused for a Religious Observance required by their faith must complete and submit a request form to the instructor(s) prior to the census date of each class. The ***Request for Excused Absences for Religious Observances*** form can be picked up from Student Services. This does not supersede the college-wide attendance policy as outlined in the college catalog or syllabus, with the exception of a reasonable accommodation for the make-up of missed course work.

### **COURSE POLICIES:**

**All persons will have and wear safety glasses at all times in shop or lab areas. Failure to adhere to safety glasses rules will result in removal from the lab area and may result in disciplinary action.**

**The shop area is defined as Rm 10A, 10B, 10C and the area the area enclosed by the chain link fence outside the lab bay doors of building 3**

Students are permitted, when entering the lab, to do so, at their own risk, without glasses if they are going directly to their tool box/work station to retrieve their glasses. “Passing though” to classrooms or hallways by employing the lab area while not wearing safety glasses is not allowed. This includes entry to the lab/class area from the parking area via the fence gate.

1. Eating /Drinking not allowed in classroom or Laboratory.
2. Work-style pants are recommended or proper fitting jeans that meet the following requirements (length above the shoes, jeans above the hip with belt/suspenders). No oversized pants/jeans will be permitted. **Shorts are not allowed.** Labcoats/Aprons are highly recommended to prevent damage to regular clothing.
3. We suggest that you refrain from wearing necklaces, rings, or bracelets of any kind as these items may pose a safety hazard. Likewise, facial jewelry can compound injury and wearing of same is discouraged in the lab
4. All belts will be of the type that does not have an exposed buckle. No keys, chains or wallets hanging out of pockets.
5. Hats are permitted in the shop area only! If a hat has a brim, it must be worn with it facing forward.
6. Students must wear leather or composite work boots or shoes. We highly recommend those with steel toes, oil resistant soles. No open toed shoes are permitted.
7. Other appearance issues not directly covered by these rules will be considered on a case-by-case basis. MCC staff will decide what is safe and professional in appearance and what is not.

**Any Student Not Following These Guidelines Will Be Dismissed From Class and Attendance Credit for That Day Will Not Be Given. No Excuses Will Be Considered.**

Students must have their tools required for class available to them at class time.

**No Tools, No Lab Credit.**

**If you cannot reach your instructor, you may contact Dr. Phyllis Broughton, Dean of Academic Affairs and Student Services at (252)789-0246 or (252)789-0247 by phone, [pbroughton@martincc.edu](mailto:pbroughton@martincc.edu) by e-mail, or in person at her office in Building 2, Room 33.**

**To access the Martin Community College Career Catalog for policies and curriculum requirements, please go online to [www.martincc.edu](http://www.martincc.edu).**

***If you have a need for a disability-related accommodation, please notify the Student Services counselor at (252-789-0293.***