COURSE OUTLINE

Course Number
AUT 213
Course Title
Engine Service
Credits
4

Hours:
lecture/Lab/Other
2    4

Co- or Pre-requisite
AUT 110, AUT 111

Implementation
sem/year
Spring 2017

Catalog description (2016-2017 Catalog): Diagnosis, failure analysis, and rebuilding procedures for automobile engines. Topics include engine operating principles, component measurement techniques, engine removal and installation, and service information usage for diagnosis. Each student is required to completely disassemble, diagnose, and assemble several four-cycle engines. Involves extensive use of special tools and equipment.

Is course New, Revised, or Modified? Revised


Revision date:
January 2017

Course coordinator:  Fred Bassini, Ext. 3776, bassinif@mccc.edu

Information resources: Chrysler DealerConnect web-site, Chrysler Academy Training Reference Books, Service Manuals, On-line and CD Disc Self-study Courses and the AllData Online Service Information Database.

Other learning resources: ASE Study Guides, Automotive Related Articles Obtained From Magazines and Journals
Course Competencies/Goals:

The student will be able to:

• demonstrate industry accepted diagnostic techniques to pinpoint engine noise concerns
• explain the function and operation of a four-cycle, gasoline engine
• analyze engine component wear patterns to identify abnormalities in fit and assembly
• demonstrate his/her ability to properly disassemble and assemble a complete engine assembly
• utilize printed and electronic service information when needed or required

Course-specific General Education Knowledge Goals and Core Skills.

General Education Knowledge Goals
Goal 1. Communication. Students will communicate effectively in both speech and writing.
Goal 2. Mathematics. Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.
Goal 3. Science. Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.
Goal 4. Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.
Goal 5. History. Students will understand historical events and movements in World, Western, non-Western or American societies and assess their subsequent significance.
Goal 6. Diversity. Students will understand the importance of a global perspective and culturally diverse peoples.
Goal 7. Ethical Reasoning and Action. Students will understand ethical issues and situations.

MCCC Core Skills
Goal A. Written and Oral Communication in English. Students will communicate effectively in speech and writing, and demonstrate proficiency in reading.
Goal B. Critical Thinking and Problem-solving. Students will use critical thinking and problem solving skills in analyzing information.
Goal C. Ethical Decision-Making. Students will recognize, analyze and assess ethical issues and situations.
Goal D. Information Literacy. Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.
Goal E. Computer Literacy. Students will use computers to access, analyze or present information, solve problems, and communicate with others.
Goal F. Collaboration and Cooperation. Students will develop the interpersonal skills required for effective performance in group situations.
Goal G. Intra-Cultural and Inter-Cultural Responsibility. Students will demonstrate an awareness of the responsibilities of intelligent citizenship in a diverse and pluralistic society, and will demonstrate cultural, global, and environmental awareness.

Units of study in detail.

Unit I REVIEW OF ENGINE THEORY OF OPERATION / BASIC ENGINE CONSTRUCTION

Learning Objectives
The student will be able to...

• explain the basic operation of all four-stroke gasoline engines
• identify possible causes for a poorly operating four-stroke, gasoline engine
• describe the function of basic parts used in engine construction
• demonstrate safety procedures while working on or near a running four-stroke, gasoline engine

A. THE FOUR-STROKE THEORY
   a. Intake
   b. Compression
   c. Power
   d. Exhaust

B. PHYSICAL PRINCIPLES OF POWER
   a. Compression
   b. Thermodynamics
C. TYPES OF AUTOMOTIVE ENGINE
   a. Engine Classification
      i. Cylinder Arrangement
      ii. Valve Arrangement
      iii. Camshaft Arrangement
      iv. Combustion Chamber Shape
   b. Displacement
D. COMPONENTS: BASIC FUNCTION AND OPERATION
   a. Crankshaft
      i. Purpose
      ii. Parts
   b. Connecting Rods and Bearings
      i. Types and Styles
      ii. Parts
   c. Valve Train
      i. Components
   d. Camshaft
   e. Cylinder Bock
   f. Cylinder Head

Unit II  ENGINE PRE-TEARDOWN DIAGNOSIS

Learning Objectives
The student will be able to...
* perform a comprehensive engine condition analysis using electrical and mechanical instruments
* evaluate test engine test data to determine possible causes for a performance concern
* demonstrate how to effectively pinpoint the cause(s) of abnormal engine noise(s)

A. REASONS FOR OVERHAUL
   a. Compression Problems
   b. Oil Consumption
   c. Abnormal Engine Noises
   d. Poor Engine Performance
B. CYLINDER CONTRIBUTION CONCERNS
   a. Compression Test/Volumetric Efficiency
      i. Mechanical Gauge
      ii. Scan Tool
   b. Cylinder Leakage
   c. Power Balance Test
      i. Manual
      ii. Scan Tool
   d. Vacuum Testing
      i. Idle
      ii. Cruise
      iii. Acceleration
      iv. Wide Open Throttle
      v. Deceleration
C. OIL CONSUMPTION
   a. Engine Oil Leakage
      i. Oil Leak Diagnosis
   b. Internal Oil Consumption
      i. Places Where Can Enter The Cylinder
      ii. Methods of Diagnosis
D. DIAGNOSING ABNORMAL ENGINE NOISES
   a. Pinpointing The Source of Engine Noise
i. Canceling Cylinders
ii. Listening Devices
   1. Upper-End Noise
   2. Lower-End Noise
iii. Crankshaft End-Play
iv. Accessory Drive Noises (assumed to be engine noises)
v. Transmission Noises (assumed to be engine noises)

Unit III  MEASUREMENT TECHNIQUES AND EQUIPMENT / COMPONENT INSPECTION

**Learning Objectives**

*The student will be able to…*

- perform measurement checks on new and warn engine components to evaluate fit and condition
- determine necessary steps needed to correct problems detected during measurement phases
- identify possible causes for abnormally sized components and recommend corrective actions
- use industry acceptable techniques and equipment while completing all engine measurements

A. UNITS OF MEASUREMENT
   a. English System Units
      i. Fractional Inches
      ii. Decimal System
   b. Metric System
      i. Millimeters

B. CONVERTING BETWEEN ENGLISH AND METRIC SYSTEM UNITS
   a. Conversion Factor
   b. Charts/Tables
   c. Computer Generated Conversions

C. MEASURING TOOLS
   a. Outside Micrometer
      i. Components of the Tool
      ii. Measuring and Reading
         1. Metric
         2. Standard
      iii. Applications and Care
   b. Inside Micrometer
      i. Comparison With Outside Micrometer
      ii. Measuring and Reading
      iii. Applications and Care
   c. Small Hole Gauges
      i. Telescoping Gauge
         1. Applications/Operation
      ii. Split-Ball Gauge
         1. Applications/Operation
   d. Feeler Gauge
      i. Applications
      ii. Proper Use and Handling
         1. Magnetic
         2. Non-Magnetic
      iii. Dial Indicator
         1. Proper Mounting of Dial Indicator
            a. Tool Holding Fixtures
            b. Applications
            c. Keeping Tool In Calibration/Damage Prevention
   e. Straight Edge
      i. Applications/Operation/Care
      ii. Use With Feeler Gauge

D. CRACK DETECTION AND LOCATING CASTING FAILURES
   a. Pre-Cleaning for Crack Detection
i. Types of Solid Contaminants
   1. Water Soluble
   2. Organic
      a. By-Product of Petroleum
      b. By-Product of Combustion
      c. Protective Coatings
   3. Rust
   4. Scale
b. Chemicals Used for Cleaning
   i. Alkaline-Base
   ii. Emulsifiable Solvent
   iii. Acid-Base
   iv. Cleaning soft Metals
   v. Safety Precautions
c. Machines and Equipment Used For Cleaning
   i. Steam Cleaners
      1. Theory of Operation
   ii. High-Pressure Washer
   iii. Emulsion Cleaning
   iv. Chemical Parts Washer
   v. Cold-Soak Tanks
   vi. Hot-Soak Tanks
   vii. Hot-Spray Tanks
   viii. Safety Precautions
d. Other Cleaning Methods
   i. Glass Beading
   ii. Sandblasting
   iii. Micropening
   iv. Safety Precautions
e. Inspection Procedures
   i. Visual Cracks and Breaks
   ii. Severe Wear Patterns
      1. Scuffing and Scoring
      2. Scratches and Grooves
      3. Component Glazing
   iii. Other Methods of Crack Detection
      1. Magneflux (magnetism)
      2. Dye Penetrant
      3. Pressure Testing
      4. Diesel Fuel Crack Testing
      5. Portable Black Light Testing (Zyclo)

Unit IV ENGINE REMOVAL FROM VEHICLE – GENERAL PROCEDURE

Learning Objectives
The student will be able to...
- locate the proper engine removal procedure in electronic and printed service manuals
- identify potential hazards associated with engine removal in various vehicle makes and models
- identify proper engine lifting points and point in need of support during the removal procedure
- exercise safety while performing an engine removal procedure to minimize personal injury and component damage
- successfully remove and install an engine in a passenger or light truck vehicle

A. PREPARATION FOR ENGINE REMOVAL
   a. Under the Hood
      i. Component Removal
      ii. Component Identification Procedures
iii. Component and Fastener Organization Techniques
iv. Fluid Removal

b. Underneath the Vehicle
i. Component Removal
ii. Component Identification Procedure
iii. Component and Fastener Organization Techniques
iv. Fluid Removal
v. Disassembly From Engine/Transmission Mounts

c. Engine Removal Procedures
i. Lifting Techniques
ii. Engine Removal
   1. Removal Through the Hood Opening
   2. Removal From the Bottom/Lowering Front Chassis/Subframe

Unit V  
LOWER ENGINE (SHORT-BLOCK) CONSTRUCTION / DESIGN / SERVICE

Learning Objectives
The student will be able to...
• demonstrate industry acceptable methods for piston removal and installation
• explain advantages and disadvantage of different metals used to construct components found in the lower portion of an engine
• explain how lateral movement of pistons is used to propel a vehicle
• analyze lower engine components and identify the need for service or replacement
• successfully disassemble and reassemble the lower-end components of a four-stroke engine

A. COMPONENTS
a. Cylinder Block / Cylinder
   i. Type of Material
   ii. Cylinder Sleeve
   iii. Internal Parts
   iv. Function

b. Crankshaft
   i. Offsets / Throws
   ii. Journal Surfaces
   iii. Counter Weights

c. Connecting Rod
   i. Parts
   ii. Piston Pin Types

d. Piston
   i. Parts
   ii. Shape and Design
   iii. Piston Expansion Control
   iv. Thrust Force / Piston Pin Offset

e. Piston Rings
   i. Types of Materials / Coatings
   ii. Types of Rings – Designs
      1. Compression
      2. Oil Control
   iii. Ring End-Gap
      1. Types

e. Bearings
   i. Types
      1. Main and Connecting Rod Insert-Type
2. Camshaft Bushing – Type
   ii. Oil Clearance
      1. Purpose
      2. Oil Grooves
      3. Cooling
      4. Oil Pressure
   iii. Construction
      1. Alloys
      2. Tri-Metal
      3. Alloy Requirements

g. Engine Oil Seals
   i. Lip Seal
   ii. “O” Ring Seal
   iii. Rope Seal
   iv. Paper / Rubber / Cork / Composite / Liquid Sealer

h. Engine Coolant Seals
   i. Core Plugs
      1. Name Variations
      2. Purpose
      3. Necessity
      4. Material Types
   ii. “O” Ring Seal
   iii. Paper / Rubber / Cork / Composite / Liquid Sealer

B. SHORT-BLOCK DISASSEMBLY PROCEDURES
   a. Cylinder Ridge Removal
      i. Using a Ridge Reamer
   b. Piston / Connecting Rod Removal
      i. Removal From Crankshaft
      ii. Cylinder Identification
      iii. Crankshaft Protection
   c. Crankshaft Removal
      i. Main Bearing Cap Identification
      ii. Crankshaft Bearing Removal
   d. Camshaft removal (Cam-In-Block / Over-Head-Valve / Push Rod Engine)
      i. Supporting Crankshaft
         1. Removal From Engine Front
         2. Removal From Engine Rear
      ii. Camshaft Bearing Removal
   e. Component Storage Methods
   f. Component Cleaning

C. COMPONENT INSPECTION
   a. Cylinder Block / Cylinders
      i. Scratches or Grooves
      ii. Cylinder Out-Of-Round
      iii. Cylinder Taper
      iv. Main Bearing Surface Out-Of-Round
      v. Crack Detection
   b. Crankshaft
      i. Scoring or Ridges
      ii. Journal Out-Of-Round or Taper
      iii. Checking Run-Out
      iv. Checking End-Play
   c. Connecting Rod
i. Checking Journal Out-Of-Round
ii. Alignment
d. Piston
i. Visual Inspection
   1. Burns / Scoring / Scuffing / Breakage
ii. Checking Wear
   1. Out-Of-Round
   2. Taper
iii. Checking Ring Groove Clearance
iv. Fitting The Piston
   1. Skirt to Cylinder Wall Clearance
v. Cleaning Piston Ring Grooves
e. Piston Rings
i. Ring End-Gap Measurement
f. Bearings
i. Clearance Measurements
   1. Tools Used For Measurement
   2. Using Plastigauge
ii. Visual Inspection

D. COMPONENT SERVICE PROCEDURES
a. Cylinder / Block
i. Glaze Breaking
   1. Purpose
   2. Tools
   3. Procedure
ii. Honing
   1. Purpose
   2. Tools
   3. Procedure
iii. Boring
   1. Purpose
   2. Tools
   3. Procedure Description
iv. Line-Boring
   1. Purpose
   2. Tools
   3. Procedure Description
b. Piston
i. Knurling
   1. Purpose
   2. Tools
   3. Procedure Description

E. SHORT-BLOCK ASSEMBLY PROCEDURES
a. Importance of Correct Torque of Fasteners
b. Use of Engine Assembly Lubricants
i. Types of Acceptable Lubricants
c. Component Installation
i. Crankshaft
   1. Main Bearing Inserts
   2. Rear Oil Seal
ii. Piston / Ring / Connecting Rod Assembly
   1. Installing Ring On Pistons
   2. Using a Piston Ring Compressor
3. Rod Bearing Inserts
4. Installation of Assembly in Cylinder Block
   iii. Camshaft Bearings (Cam-In-Block / Over-Head-Valve / Push Rod Engine)
   iv. Camshaft (Cam-In-Block / Over-Head-Valve / Push Rod Engine)
   v. Timing Chain (Cam-In-Block / Over-Head-Valve / Push Rod Engine)
      1. Valve Timing
      2. Checking Camshaft End-Play
   vi. Core Plug Installation

Unit VI    UPPER ENGINE CONSTRUCTION / DESIGN / RECONDITIONING

Learning Objectives
The student will be able to...
* demonstrate industry acceptable techniques to recondition a cylinder head
* properly operate a valve grinding machine and seat cutting machine
* explain the operation of different cylinder head designs and applications
* determine the necessity for cylinder head reconditioning or replacement
* analyze a damaged cylinder head and pinpoint potential causes of the damage
* successfully disassemble and reassemble all types of cylinder heads using the proper tools and equipment

A. COMPONENTS
   a. Cylinder Heads
   b. Valve Guides and Seals
   c. Valves
   d. Valve Seats
   e. Valve Spring Assembly
   f. Rocker Arms and Push Rods

B. CYLINDER HEAD
   a. Construction Material
      i. Cast Iron
      ii. Aluminum
   b. Combustion Chamber Designs
      i. Wedge
         1. Turbulent
      ii. Hemispherical
         1. Non-Turbulent
      iii. Pent-Proof (“V”-Shaped)
         1. Four-Cylinders
         2. Efficiency
         3. Lower Emissions
      iv. Measuring For Warpage
         1. Scores or Scratches
         2. Maximum Allowances

C. VALVE GUIDES AND SEALS
   a. Types of Guide Material
   b. Lubrication and Cooling
   c. Guide Failures
      i. Galloning
      ii. Oil Consumption Through Guides
      iii. Bellmouthing
   d. Guide Measurement Procedures
      i. Telescoping or Split-Ball Gauge
ii. Dial Indicator
iii. Maximum Clearances
e. Types of Valve Seals
   i. Umbrella Type
   ii. “O” Ring Type
   iii. Positive Type

D. VALVES / VALVE SEATS
   a. Valve Geometry
      i. Valve Head
      ii. Valve
      iii. Valve Face / Margin
   b. Valve Heat Transfer
   c. Types of Valves
      i. Swirl-Polished
      ii. Aluminized Valve
      iii. Sodium Valves
      iv. Canted Valve
   d. Valve Hard Facing
   e. Valve Seats
      i. Hardened Surface
      ii. Seat Inserts
      iii. Angles
         1. Top
         2. Face
         3. Throat
   f. Valve Assembly and Seat Diagnosis
      i. Micrometer
      ii. Valve Failures
         1. Burning
         2. Breakage

E. SPRING ASSEMBLY
   a. Components
      i. Function
         1. Spring
         2. Keepers / Retainers
         3. Retainer Washers
         4. Shims
         5. Valve Rotators (Where Applicable)
   b. Spring Harmonics
   c. Valve Rotation
      i. Advantages
         1. Minimized Stem Deposits
         2. Keeps Face and Seat Clean
         3. Prevents Valve Edge Burning
         4. Maintains Uniform Valve Head Temperatures
         5. Prevent Valve Edge Distortion
         6. Maintains Uniform Stem Tip Wear
         7. Maintains Uniform Stem Lubrication
   d. Spring Measurement
      i. Squareness
      ii. Free Standing Height
      iii. Spring Pressure Testing

F. ROCKER ARMS AND PUSH RODS
a. Types of Rocker Arms
   i. Cast
   ii. Stamped Steel
   iii. Rollerized
   iv. Cam Followers (Over-Head-Cam / Cam-In-Head)
b. Rocker Arm Stands and Studs
c. Rocker Arm Shafts
d. Rocker Arm Lubrication
   i. Oil Galleries
   ii. Push Rod
e. Rocker Arm Geometry
f. Fault Detection
   i. Wear Patterns
   ii. Measuring

G. CYLINDER HEAD RECONDITIONING PROCEDURES
a. Cylinder Head Disassembly
   i. Cam-In-Block / Over-Head-Valve / Push Rod Engine Type
   ii. Over-Head-Cam / Cam-In-Head Type
   iii. Removing Valves / Spring Assembly
      1. Matching Components and Location
         a. Keeping Parts Organized
b. Valve Guide Service
   i. Cleaning
   ii. Reaming
   iii. Knurling
      1. Clearance
      2. Procedure
      3. Advantages
      4. Disadvantages
   iv. Installing Valve Guide Inserts
      1. Types of Inserts
      2. Methods of Removal and Installation
v. Guide Beveling
c. Valve Resurfacing
   i. Valve Cleaning – Carbon Build-Up Removal
      1. Scraper
      2. Old Valve
      3. Wire Wheel
   ii. Machining the Valve Face
      1. Setting Up the Machine
      2. Chucking the Valve
      3. Using the Machine
      4. Grinding the Valve
         a. Edge Breaking
         b. Hard-Faced Valves
         c. Grinding Patterns
         d. Final Inspection
   5. Machining the Valve Seat
      a. Preliminary Checks
      b. Stone Selection
      c. Dressing the Stone
         i. Safety
      d. Inserting the Valve Seat Pilot
e. Grinding the Seat
   i. Face Angle
   ii. Top Angle
   iii. Throat Angle

f. Checking Contact Area
   i. Adjustment
   ii. Further Cutting
   iii. Lapping the Valve

H. CYLINDER HEAD REASSEMBLY
   a. Installing Valve Seals
      i. Care
      ii. Special Tools
   b. Installing Valve Springs
      i. Special Tools
      ii. Installing Keepers and Retainers
      iii. Pre-Lubricants

Unit VII VALVE ACTUATION AND VALVE TIMING SYSTEMS AND COMPONENTS

Learning Objectives
The student will be able to...
* analyze and engine’s valve timing system to determine type and function
* properly set valve timing using appropriate service information
* explain the fundamental design differences on OHV and OHC timing systems
* properly diagnose engine concerns cause by inadequate valve timing
* explain the problems associated with improper valve timing on freewheeling and non-freewheeling engines

A. LIFTER THEORY
   a. Valve Train Clearance
      i. Temperature
   b. Types of Lifters
      i. Hydraulic
      ii. Solid
      iii. Rollerized
   c. Hydraulic Lifter
      i. Maintain Zero Lash (Clearance)
      ii. Lifter Construction
         1. Oil Flow
         2. Construction
      iii. Lifter Operation
      iv. Pump-Up
   d. Fault Detection
      i. Leak-Down Test
      ii. Wear Patterns
   e. Cam Followers (OHC)
      i. Tappets (OHC Version of a Lifter)
         1. Similar Function

B. CAMSHAFT THEORY
   a. Camshaft Design (Profile)
      i. Clearance Ramps
      ii. Heal / Toe
      iii. Lifter Base Diameter
iv. Lift
v. Duration
vi. Overlap (Lobe Centers)
b. Interchangeability for Solid and Hydraulic Camshafts
c. Camshaft End Thrust
   i. Measurement
d. Lifter Duration
e. Fault Detection
   i. Wear Patterns
   ii. Measuring Techniques
      1. Lobe Lift
      2. Base Circle Run-Out
      3. Straightness
f. Camshaft / Lifter Break-In
   i. Assembly Lubricants

C. CAMSHAFT DRIVE METHODS / VALVE TIMING SYSTEMS
   a. Gear-To-Gear
   b. Chain Drive
      i. Chain Guides
      ii. Tensioners
         1. Hydraulic
         2. Mechanical
c. Drive Belt
   i. Idler Pulleys
   ii. Tensioners
      1. Hydraulic
      2. Mechanical
   iii. Belt Service Requirements
d. Fault Detection
   i. Cam Drive Wear
      1. Deflection Method
      2. Pin Movement Method
      3. Distributor Rotor Movement Method

Unit VIII COMPLETE ENGINE ASSEMBLY AND START-UP PROCEDURES

Learning Objectives
The student will be able to...
• demonstrate industry acceptable techniques to properly reassemble a gasoline automotive
  four-stroke engine
• recognize the importance of following proper fastener torque procedures
• explain why it is necessary to prime the lubrication system before starting the engine
• explain common problems overlooked during the reassembly procedure

A. ENGINE REASSEMBLING
   a. Installation of Cylinder Head Assembly
      i. Head Gasket Installation
      ii. Surface Preparation
      iii. Torque Sequence
      iv. Timing Belt Installation (OHC)
   b. Installation of Lifters and Push Rods
      i. Lifter Pre-Prime (Hydraulic)
      ii. Camshaft / Lifter Assembly Lube
iii. Installing the Push Rods
  1. Lubrication
iv. Lifter Pre-Load (Zero Lash)
c. Installing the Manifolds (Intake and Exhaust)
  i. Gasket Surface Preparation
  ii. Types of Gaskets and Seals
  iii. Torque Sequence
d. Installing All Bolt-On Items and Accessories
  i. Harmonic Balancer
  ii. Flywheel / Flex Plate
  iii. Core Plug Installation
  iv. Oil Pan and Covers

B. ENGINE START-UP PROCEDURES
a. Priming the Oil Pump
  i. Importance and Purpose
b. Initial Start-Up
  i. Safety Practices
  ii. Break-In Speed
  iii. Maintaining All Fluid Levels
c. Lifter Adjustment
  i. Hydraulic
  ii. Solid
  iii. Methods of Oil Retention During Adjustment
d. Post Start-Up Procedures
  i. Set Ignition Timing
  ii. Adjust Carburetor (If Equipped)
  iii. Top Off All Fluids
  iv. Check For Fluid Leaks
  v. Re-Torque Head Bolts (As Required)

Unit IX COURSE REVIEW / FINAL EXAM

A. REVIEW OF ENGINE THEORY OF OPERATION / BASIC ENGINE CONSTRUCTION
B. ENGINE PRE-TEARDOWN DIAGNOSIS
C. MEASUREMENT TECHNIQUES AND EQUIPMENT / COMPONENT INSPECTION
D. ENGINE REMOVAL FROM VEHICLE – GENERAL PROCEDURE
E. LOWER ENGINE (SHORT-BLOCK) CONSTRUCTION / DESIGN / SERVICE
F. UPPER ENGINE CONSTRUCTION / DESIGN / RECONDITIONING
G. VALVE ACTUATION AND VALVE TIMING SYSTEMS AND COMPONENTS
H. COMPLETE ENGINE ASSEMBLY AND START-UP PROCEDURES
Evaluation of student learning:

A. Lab Work 40%
B. Test/Quizzes/Homework Assignments/Final Exam 60%

Academic Integrity Statement:

Mercer County Community College is committed to Academic Integrity-- the honest, fair and continuing pursuit of knowledge, free from fraud or deception. This implies that students are expected to be responsible for their own work, and that faculty and academic support services staff members will take reasonable precautions to prevent the opportunity for academic dishonesty.

Reasonable Accommodations for Students with Documented Disabilities

Mercer County Community College is committed to ensuring the full participation of all students in all activities, programs and services. If you have a documented differing ability or think that you may have a differing ability that is protected under the ADA and Section 504 of the Rehabilitation Act, please contact Arlene Stinson in LB 216 stinsona@mccc.edu for information regarding support services. If you do not have a documented differing ability, remember that other resources are available to all students on campus including academic support through our Academic Learning Center located in LB 214.