

PALOMAR COLLEGE
COURSE OUTLINE OF RECORD FOR
DEGREE CREDIT COURSE

X Transfer Course X A.A. Degree applicable course
(check all that apply)

COURSE NUMBER AND TITLE: AT 197 Associated Studies in Automotives

UNIT VALUE: 3

MINIMUM NUMBER OF SEMESTER HOURS: 48

BASIC SKILLS REQUIREMENTS: Appropriate language and computational skills

ENTRANCE REQUIREMENTS

PREREQUISITE: None

COREQUISITE: None

RECOMMENDED PREPARATION: None

SCOPE OF COURSE:

Applied science and technology as related to the automotive field. Areas covered include metrics, Ohms Law and electron theory, metal alloys and their properties and uses, thermal expansion, gas laws, limits and fits, and friction and torque.

SPECIFIC COURSE OBJECTIVES:

Successful students will be able to:

1. Identify, measure, and compute various engine operating parameters.
2. Apply basic principles and calculations involving gas laws, thermal expansion, moments, complex gear sets, fluid mechanics, and Ohm's Law.
3. Apply principles of shop safety.

CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:

- I. Engine operation
 - A. Cycles
 1. Cam diagrams

2. Crank diagrams
3. Power pulses
- B. Measurement
 1. Horsepower
 2. Torque
 3. Volumetric efficiency
 4. Specific fuel consumption
 5. Thermal efficiency
 6. Displacement
 7. Compression ratio
 8. Break mean effective pressure
- II. Heat
 - A. Conversion
 - B. Gas laws
 1. Boyle
 2. Charles
 - C. Change of state
 - D. Thermal expansion
 1. Linear
 2. Superficial
 3. Volumetric
- III. Mechanics and Machines
 - A. Friction and lubrication
 - B. Moments and Center of gravity
 - C. Mechanical efficiency
 - D. Simple and complex gear sets
- IV. Electricity
 - A. Ohm's law
 - B. Magnetism
- V. Mechanics of fluids
 - A. Movement ratio
 - B. Force ratio
- VI. Fabrication
 - A. Cutting tools
 - B. Measurements
 - C. Limits and fits
 - D. Fasteners
- VII. Calculations
 - A. Ratio
 - B. S.I. units and conversion
- VIII. Review shop safety principles

REQUIRED READING: None

SUGGESTED READING:

Crouse, William. Automotive Engine Design. New York: McGraw Hill Publishing Company, 1980

Hillier, A.W. Motor Vehicle Technology. London: Butterworth Publishing Company, 1980

REQUIRED WRITING:

Students will prepare a research report of approximately five pages on subjects related to automotive design.

OUTSIDE ASSIGNMENTS:

Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.

Solve problems as assigned each class session. Research report.

INSTRUCTIONAL METHODOLOGY:**Check all that apply:**

- lecture
 laboratory
 lecture-laboratory combination
 directed study

DISTANCE LEARNING:

This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.

Yes No

If yes, check all that apply:

- Television Course (Video one-way, e.g. ITV, video cassette, etc.)
 Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
 Two-Way Video Conferencing (Two-way interactive video and audio)
 One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
 Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

GRADING POLICY AND STANDARDS (include methods of determining whether the stated objectives have been met by students):

- 50% Homework, research report, class participation. Homework consists of written assignments from lecture material similar to that presented in the classroom. Homework is expected to be submitted by the next class meeting.
- 20% Unit quizzes are offered throughout the semester and are intended to measure the students' level of progress in the course.
- 30% A final exam consists of a comprehensive review of the subject matter presented in the course.

IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?

Yes _____ No X Number of times course may be taken for credit: 1

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable:

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SIGNATURES ON FILE