CIC Approval: 04/10/2003
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STATE APPROVAL:
EFFECTIVE TERM: Spring 2003

SAN DIEGO COMMUNITY COLLEGE DISTRICT
MIRAMAR COLLEGE
ASSOCIATE DEGREE COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER: Diesel Technology 123

COURSE TITLE: Diesel Engines C **Units:** 2
Grade Only

CATALOG COURSE DESCRIPTION:

Students learn the fundamental skills necessary to evaluate and repair engine components and accessories including cylinder blocks. Students also learn how to remove and install engines.

REQUISITES:

Corequisite: Completion of or concurrent enrollment in:
DIES 100 with a grade of "C" or better, or equivalent

Limitation on Enrollment:

This course is not open to students with previous credit for DIES 127

FIELD TRIP REQUIREMENTS: May be required

TRANSFER APPLICABILITY: Associate Degree Credit & transfer to CSU and/or private colleges and universities

TOTAL LECTURE HOURS: 16 - 18

TOTAL LAB HOURS: 48 - 54

STUDENT LEARNING OBJECTIVES:
Upon successful completion of the course the student will be able to:

1. Examine and describe the evaluation guidelines for diesel engine components
2. Compare costs for reconditioning, exchanging, and replacing diesel engine components
3. Distinguish specifications and tolerances for rebuilding various diesel engine components
4. Demonstrate how to rebuild diesel engine water pumps
5. Demonstrate how to rebuild diesel engine oil pumps
6. Demonstrate how to rebuild diesel engine aftercoolers
7. Demonstrate how to rebuild diesel engine oil coolers
8. Demonstrate how to rebuild diesel engine blowers
9. Demonstrate how to rebuild diesel engine turbochargers
10. Examine and describe the evaluation guidelines for diesel engine cylinder blocks
11. Distinguish specifications and tolerances for reconditioning diesel engine cylinder blocks
12. Demonstrate how to recondition diesel engine cylinder blocks
13. Demonstrate how to remove and install a complete diesel engine
14. Compare costs for reconditioning, exchanging, and replacing diesel engine cylinder blocks.

SECTION II

1. COURSE OUTLINE AND SCOPE:

A. **Outline Of Topics:**
The following topics are included in the framework of the course but are not intended as limits on content. The order of presentation and relative emphasis will vary with each instructor.

I. Evaluation guidelines for diesel engine components
  A. Reusability of components
  B. Cost comparison
    1. Rebuilding
    2. Exchanging
    3. Replacing with new.

II. Rebuilding diesel engine water pumps
  A. Guidelines
  B. Special tools
  C. Specifications and tolerances.

III. Rebuilding diesel engine oil pumps
  A. Guidelines
  B. Special tools
  C. Specifications and tolerances.

IV. Rebuilding diesel engine aftercoolers
  A. Guidelines
  B. Special tools
  C. Specifications and tolerances.

V. Rebuilding diesel engine oil coolers
  A. Guidelines
  B. Special tools
  C. Specifications and tolerances.

VI. Rebuilding diesel engine blowers
  A. Guidelines
  B. Special tools
  C. Specifications and tolerances.

VII. Rebuilding diesel engine turbochargers
  A. Guidelines
  B. Special tools
  C. Specifications and tolerances.

VIII. Evaluation guidelines for diesel enginge cylinder blocks
  A. Cost comparison
    1. Reconditioning,
    2. Exchanging
    3. Replacing with new.
  B. Reconditioning cylinder blocks
    1. Guidelines
    2. Special tools
    3. Specifications and tolerances.

IX. Removing and installing engines
  A. Guidelines
  B. Special tools and shop equipment
  C. Engine and vehicle systems performance test.

B. **Reading Assignments:**
Reading assignments are required and may include but, are not limited to, the following:

I. 1. Chapters from course textbook(s)
II. 2. Articles related to diesel repair in professional journals such as Service Tech, Diesel Progress, Commercial Carrier Journal (CCJ), Utility Fleet, Fleet Owner, and Transportation Equipment News
III. 3. Reports, repair manuals, on-line resources, and laboratory guides associated with diesel technology.

C. **Appropriate Assignments that Demonstrate Critical Thinking:**
Critical thinking assignments are required and may include, but are not limited to, the following:

I. 1. Analyzing methods learned in class and utilizing appropriate methods for completing laboratory tasks
II. 2. Evaluating and recording the condition of diesel engine components
III. 3. Formulating repair plans for diesel engine components and cylinder blocks
IV. 4. Calculating and solving mathematical problems.

D. **Appropriate Outside Assignments:**
Outside assignments may include, but are not limited to, the following:

I. 1. Conducting research
II. 2. Completing all reading and writing assignments, including a shop notebook
III. 3. Completing field assignments/projects.

E. **Writing Assignments:**
Writing assignments are required and may include, but are not limited to, the following:

I. 1. Preparing a shop notebook
II. 2. Writing an engine component evaluation report
III. 3. Responding to short essay questions about related topics such as cylinder block repair, and/or removing and installing a diesel engine from an on-highway truck or a piece of heavy equipment.

2. METHODS OF EVALUATION:

A student's grade will be based on multiple measures of performance unless the course requires no grade. Multiple measures may include, but are not limited to, the following:

I. Performing manipulative skills as needed to complete laboratory assignments satisfactorily Successfully applying theory to laboratory assignments Performing on written, oral, and/or practical examinations Performing on out-of-class assignments including diesel engine component reports and projects Contributing to class discussion Maintaining attendance per current department policy.

3. METHODS OF INSTRUCTION:

Methods of instruction may include, but are not limited to, the following:

* Lecture
* Lecture Discussion
* Computer Assisted Instruction
* Laboratory
* Discussion Seminar
* Lecture-Lab Combination
* Learning Modules
* Audio-Visual
* Collaborative Learning
* Shadowing
* Other (Specify)
* A. Demonstration
* B. Field trips and/or field assignments.

4. REQUIRED TEXTS AND SUPPLIES:
Textbooks may include, but are not limited to:

TEXTBOOKS:

1. Dagel, John F., and Robert N. Brady. Diesel Engine and Fuel System Repair, 1 ed. Prentice-Hall, 1998, ISBN: 0133996921
2. Lewis, Jim. DIES-M Daily Reports, 2 ed. Miramar Reprographics, 1976,

MANUALS:

PERIODICALS:

SOFTWARE:

SUPPLIES:
1. Safety glasses
2. Calculator
3. Appropriate clothing and footwear for shop work
4. Scantron answer sheets

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