

DET 170 Course Outline as of Summer 2010**CATALOG INFORMATION**

Dept and Nbr: DET 170 Title: ELECTRICAL POWER GENER.

Full Title: Electrical Power Generation

Last Reviewed: 11/26/2001

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	2.00	Lecture Scheduled	3.00	8	Lecture Scheduled	24.00
Minimum	2.00	Lab Scheduled	3.00	8	Lab Scheduled	24.00
		Contact DHR	0		Contact DHR	0
		Contact Total	6.00		Contact Total	48.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 48.00

Total Student Learning Hours: 96.00

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

The study of electrical power generation as it applies to stationary and mobile engine powered systems. Alternating and direct current systems will be studied and worked on in the classroom and lab. This course is designed for students enrolled in the diesel equipment technology program who desire to work on electrical power generation units.

Prerequisites/Corequisites:**Recommended Preparation:**

DET 60, DET 65 or AUTO 56, and DET 64 or DET 71.

Limits on Enrollment:**Schedule of Classes Information:**

Description: The study of electrical power generation as it applies to stationary and mobile engine powered systems. Classroom and lab work on alternating and direct current systems. Designed for DET students who desire to work on electrical power generation units. (Grade Only)

Prerequisites/Corequisites:

Recommended: DET 60, DET 65 or AUTO 56, and DET 64 or DET 71.

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:

IGETC:	Transfer Area	Effective:	Inactive:
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CSU Transfer:	Effective:	Inactive:
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UC Transfer:	Effective:	Inactive:
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CID:

Certificate/Major Applicable:

Certificate Applicable Course

COURSE CONTENT

Outcomes and Objectives:

Upon completion of the course each student will be able to:

1. List and apply electrical equipment safety rules.
2. State the basic math formulas relating to electricity.
3. Calculate electrical current, voltage and resistance mathematically.
4. Define the fundamentals of direct and alternating current.
5. Evaluate the condition of a generator or alternator.
6. Describe common generator/alternator components.
7. Identify the components that make a voltage regulator.
8. Evaluate the condition of a generator or alternator.
9. Calculate load and loss for generator testing.
10. Test a generator for load capacity.
11. Maintain, adjust, and repair generator sets.
12. Discuss and apply personal, shop, and environmental safety procedures.

Topics and Scope:

1. Electrical safety
 - a. safety equipment
 - b. grounding procedures
 - c. lock out / tag out procedures
2. Math and electricity
 - a. voltage
 - b. current
 - c. resistance formulas
3. Electrical fundamentals review
 - a. volts, OHMS, AMPS, and HERTZ
 - b. AC/DC properties

- c. single phase / three phase
- 4. Generators and alternators
 - a. DC generator design and components
 - b. alternator design and components
- 5. Testing and assessment
 - a. multimeter application
 - b. amperage testing
 - c. high resistance and voltage drops
- 6. Voltage Regulators, adjustment and testing
 - a. internal voltage regulator
 - b. external voltage regulator
- 7. Maintenance and repair
 - a. scheduled maintenance
 - b. scheduled down time for repairs
 - c. unscheduled repair procedures
- 8. Load testing
 - a. live testing procedures
 - b. load bank testing
 - c. required adjustments
- 9. Safety
 - a. personal
 - b. shop
 - c. environmental

Assignment:

1. Quizzes on theory of electricity.
2. Calculations involving electrical math formulas to assess power requirements.
3. Use common electrical testing tools and equipment.
4. Disassemble and reassemble a generator.
5. Set up, connect, operate, and test a generator.
6. Make needed adjustments or repairs.
7. Write lab reports.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.

Writing
0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Lab reports, Quizzes, Exams

Problem solving
10 - 35%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Class performances, Performance exams

Skill Demonstrations
30 - 50%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, True/false, Matching items, Completion

Exams
15 - 30%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation.

Other Category
5 - 10%

Representative Textbooks and Materials:

Joe Kaiser, Electrical Power. Goodheart-Wilcox, 1998.