

10/11/2024

DATE

TEC DIVISION



REQUIRED COURSE



NEW COURSE



ELECTIVE COURSE



REVISION

# Lake Land College

## Course Information Form

|                                      |   |                  |  |                        |                          |      |                              |         |          |        |     |
|--------------------------------------|---|------------------|--|------------------------|--------------------------|------|------------------------------|---------|----------|--------|-----|
| COURSE NUMBER:                       | AUT-083   |                  | TITLE: (30 Characters Max)   |                        | Vehicle Emission Systems |      |                              |         |          |        |     |
| SEM CR HRS:                          | 3   | Lecture:         | 2  | Lab:                   | 2                        |      |                              | ECH:    | 4        |        |     |
| Course Level:                        | <input type="checkbox"/> Gen Ed / IAI<br><input type="checkbox"/> Baccalaureate /Non-IAI  |                  | <input checked="" type="checkbox"/> Career/Technical<br><input type="checkbox"/> Dev Ed/ Not in Degree Audit |                        | Clinical Practicum:      | 0    | Work-based Learning:         | 0       | WBL ECH: | 0      |     |
| COURSE PCS #                         | 12 - 47.0604  |                  | IAI Code   |                        | N/A                      |      | Contact Hours (Minutes/Week) |         |          |        |     |
| Repeatable (Y/N):                    | N   | Pass/Fail (Y/N): | N  | Variable Credit (Y/N): | N                        | Min: | Max:                         | 16 Wks. | 200      | 8 wks. | 400 |
| Prerequisites:                       | AUT-048, AUT-051, AUT-052 and AUT-081 or consent of instructor  |                  |  |                        |                          |      |                              |         |          |        |     |
| Corequisites:                        | None  |                  |  |                        |                          |      |                              |         |          |        |     |
| Catalog Description: (40 Word Limit) | This course is a study of vehicle emission control systems in both gasoline and light diesel vehicles. This will include air induction systems and exhaust systems. |                  |  |                        |                          |      |                              |         |          |        |     |

| List the Major Course Segments (Units)           | Contact Lecture Hours | Contact Lab Hours | Clinical Practicum | Work-based Learning |
|--|-----------------------|-------------------|--------------------|---------------------|
| Turbocharger systems                             | 4                     | 2                 |                    |                     |
| Air induction and EGR systems                    | 4                     | 2                 |                    |                     |
| Exhaust and after-treatment systems              | 4                     | 2                 |                    |                     |
| Vehicle emissions standards and testing          | 10                    | 10                |                    |                     |
| Emission control devices operation and diagnosis | 10                    | 10                |                    |                     |
| <b>TOTAL</b>                                     | <b>32</b>             | <b>26</b>         | <b>0</b>           | <b>0</b>            |

### EVALUATION

|          |                                     |          |                                     |            |                                     |        |                          |
|----------|-------------------------------------|----------|-------------------------------------|------------|-------------------------------------|--------|--------------------------|
| QUIZZES  | <input checked="" type="checkbox"/> | EXAMS    | <input checked="" type="checkbox"/> | ORAL PRES  | <input type="checkbox"/>            | PAPERS | <input type="checkbox"/> |
| LAB WORK | <input checked="" type="checkbox"/> | PROJECTS | <input type="checkbox"/>            | COMP FINAL | <input checked="" type="checkbox"/> | OTHER  | <input type="checkbox"/> |

### COURSE MATERIALS

|                     |  |                                  |
|---------------------|--|----------------------------------|
| TITLE:              | Automotive Electrical and Engine Performance | Light Vehicle Diesel Engines     |
| AUTHOR:             | James D. Halderman                           | James D. Halderman and Curt Ward |
| PUBLISHER:          | Pearson                                      | Pearson                          |
| VOLUME/EDITION/URL: | 8th edition                                  |                                  |
| COPYRIGHT DATE:     | 2020   | 2019                             |

| MAJOR COURSE SEGMENT                             | HOURS | LEARNING OUTCOMES   |
|--|-------|---|
|  |       | <i>The student will be able to:</i>   |
| Turbocharger systems                             | 6     | 1. Explain the airflow requirements, volumetric efficiency, forced induction and boost control.<br>2. Demonstrate inspecting, testing and replacement of components as needed.  |
| Air induction and EGR systems                    | 6     | 1. Explain the purpose and function of the EGR system and the air induction systems.<br>2. Demonstrate inspecting, testing and replacement of components as needed.   |
| Exhaust and after-treatment systems              | 6     | 1. Explain the purpose and function of the exhaust and after treatment systems.<br>2. Demonstrate inspecting, testing and replacement of components as needed.  |
| Vehicle emissions standards and testing          | 20    | 1. Explain emissions standards<br>2. Identify the reasons of excessive emissions, and service requirements.<br>3. Demonstrate inspecting, testing and replacement of components as needed.  |
| Emission control devices operation and diagnosis | 20    | 1. Explain the purpose, function and service of the EGR system, PCV system, secondary air-injection system, catalytic converters and EVAP systems.<br>2. Demonstrate inspecting, testing and replacement of components as needed. |
|  | 58    |   |

| Outcomes*                           | At the successful completion of this course, students will be able to:   |
|-------------------------------------|--|
| Course Outcome                      | Assessing the EVAP system on a vehicle.  |
| Course Outcome                      | Testing the EGR system on a vehicle.   |
| Course Outcome                      | Assessing the after treatment system on a diesel vehicle.  |
| Primary Laker Learning Competency   | Information & Technology Literacy: Students not only identify when information is necessary, but they also find, evaluate and use that information effectively with the appropriate technological tools. |
| Secondary Laker Learning Competency | Creative Thinking & Problem Solving: Students think creatively and solve problems by successfully combining knowledge in new ways.   |

*\*Course and program outcomes will be used in the software for outcomes assessment and should include at least 1 primary and 1 secondary Laker Learning Competency. Limit to 3-5.*