

ILLINOIS VALLEY COMMUNITY COLLEGE



COURSE OUTLINE

DIVISION: Workforce Development

COURSE: ATO 2240 - Automotive Accessories

Date: Spring 2014

Credit Hours: 3

Prerequisite(s): ATO 1220 or consent of instructor

Delivery Method:

<input checked="" type="checkbox"/> Lecture	2 Contact Hours (1 contact = 1 credit hour)
<input type="checkbox"/> Seminar	0 Contact Hours (1 contact = 1 credit hour)
<input checked="" type="checkbox"/> Lab	2 Contact Hours (2 contact = 1 credit hour)
<input type="checkbox"/> Clinical	0 Contact Hours (3 contact = 1 credit hour)
<input type="checkbox"/> Online	
<input type="checkbox"/> Blended	

Offered: Fall Spring Summer

IAI Equivalent –**Only for Transfer Courses**–go to <http://www.itransfer.org>.

CATALOG DESCRIPTION:

This course provides a comprehensive understanding of vehicle electrical accessories/systems, and troubleshooting techniques. They include electrical wiring diagrams, basic electrical tests, cruise controls, windshield wipers, instrument gauges, lighting circuits, steering wheels, short circuit testers, power (seats, door locks, windows, and sliding door), body computer, air bags, keyless entry, anti-theft, electronic displays, and communications networking.

GENERAL EDUCATION GOALS ADDRESSED

[See the last page of this form for more information.]

Upon completion of the course, the student will be able:

[Choose those goals that apply to this course.]

- To apply analytical and problem solving skills to personal, social and professional issues and situations.
- To communicate orally and in writing, socially and interpersonally.
- To develop an awareness of the contributions made to civilization by the diverse cultures of the world.
- To understand and use contemporary technology effectively and to understand its impact on the individual and society.
- To work and study effectively both individually and in collaboration with others.
- To understand what it means to act ethically and responsibly as an individual in one's career and as a member of society.
- To develop and maintain a healthy lifestyle physically, mentally, and spiritually.
- To appreciate the ongoing values of learning, self-improvement, and career planning.

EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:

[Outcomes related to course specific goals.]

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

Provided a vehicle, a service manual, the proper tools and equipment, the student will be able to perform the following performance objectives after instruction in the classroom and a demonstration in lab:

1. Demonstrate the proper hookup and use for the following electrical test instruments:
 - a. ammeter
 - b. ohmmeter
 - c. potentiometer
 - d. short circuit tester
 - e. test light
 - f. voltmeter
2. Test fuses and circuit breakers with a test light and voltmeter.
3. Test the charging system output.
4. Perform an alternator diode test on the oscilloscope and interpret the patterns.
5. Identify electrical circuit symbols.
6. Trace wiring diagrams to solve electrical circuit problems.
7. Locate grounds and shorts by using a short circuit tester.
8. Repair defective wiring found on a vehicle.
9. Test electrical circuits with General Motors equipped engine and air conditioning diagnostic connectors.
10. Adjust headlights to meet state inspection standards.
11. Adjust reverse backup lights switch correctly.
12. Adjust a neutral safety switch correctly.
13. Test and service instrument gauges with a potentiometer.
14. Inspect and service sending units with an ohmmeter.

15. Install a complete speed control unit.
16. Diagnose speed control component malfunctions.
17. Inspect and service safety and warning systems.
18. Inspect and service wiper/washer malfunctions.
19. Troubleshoot pulse wiper systems.
20. Ohmmeter check an antenna for the correct amount of resistance.
21. Inspect and service all types of radios and speakers.
22. Trim radio antenna for maximum reception.
23. Adjust the pitch of a horn with an ammeter.
24. Remove and replace a door panel and repair a window regulator or channel guide.
25. Inspect and service power seats and windows and electric door locks.
26. Inspect and service speedometer head/cable and gear.

Electrical Fundamentals

- | | |
|----|--------------------------------------|
| A. | Atomic Structure |
| B. | Semiconductors |
| C. | Conventional Current Flow Theory |
| D. | Electron Current Flow Theory |
| E. | Basic Parts of an Electrical Circuit |
| F. | Ohm's Law |
| G. | Series Circuit |
| H. | Parallel Circuit |
| I. | Voltage Drop |

II. Wiring and Wiring Service

- | | |
|----|---------------------|
| A. | Wire Size |
| B. | Resistance of Wires |
| C. | Insulation |
| D. | Wire Splicing |
| E. | Soldering Wire |

III. Electrical Test Instruments

- | | |
|----|-----------------------|
| A. | Ammeter |
| B. | Ohmmeter |
| C. | Potentiometer |
| D. | Short Circuit Tester |
| E. | Test Light |
| F. | Voltmeter |
| G. | Diagnosis and Service |

IV. Reading Electrical Wiring Diagrams

- | | |
|----|---------------------------------|
| A. | Circuit Symbols |
| B. | Wire and Circuit Identification |
| C. | Tracing Electrical Circuits |
| D. | Diagnosis and Service |

- V. Electrical Diagnosis
 - A. Testing Methods
 - B. Common Point Diagnosis
 - C. General Motor's Diagnostic Connectors
 - D. Diagnosis and Service

VI. Lighting

- A. Headlamps
- B. Hazard Lamps
- C. Courtesy Lamps
- D. Turn Signals
- E. Fiber Optics
- F. Diagnosis and Service

VII. Dash and Display Panel Instruments

- A. Voltage Limiters
- B. Thermoelectric Gauges
- C. Electromagnetic Gauges
- D. Sending Units
- E. Fuel System
- F. Charging Systems
- G. Oil Pressure System
- H. Coolant System
- I. Gauge and Indicator Lights
- J. Diagnosis and Service

VIII. Safety Systems

- A. Windshield Wipers and Washers
- B. Rear - Window Defoggers
- C. Seat Belt Warning Systems
- D. Antiskid Brake Control Systems
- E. Brake Warning Systems
- F. Diagnosis and Service

IX. Warning Devices

- A. Horns
- B. Anti-theft Alarm Systems
- C. Speedminders
- D. Door - Ajar Warning Systems
- E. Headlamp and Key Warning Systems
- F. Reverse Warning Systems
- G. Diagnosis and Service

X.	Convenience Systems
A.	Electric Door Locks
B.	Power Windows
C.	Power Seats
D.	Keyless Entry System
E.	Electronic Fuel Injection
F.	Electric Fuel Pumps
G.	Electric Overdrives
H.	Speed Controls
I.	Concealed Headlamps
J.	Electric Clocks
K.	Radios and Sound Systems
L.	Antenna Systems
M.	Diagnosis and Service

COURSE TOPICS AND CONTENT REQUIREMENTS:

INSTRUCTIONAL METHODS:

1. Lecture
2. Demonstration
3. Filmstrips
4. Films
5. Reading Assignments
6. Questions
7. Quizzes
8. Exams
9. Handouts
10. Transparencies

INSTRUCTIONAL MATERIALS:

TEXT: Auto Electricity and Electronics. Goodheart Wilcox Publishing Co., 1998
Workbook

STUDENT REQUIREMENTS AND METHODS OF EVALUATION:

1. Meet classroom and lab objectives of this course as stated in course outline.
2. Pass written exams and quizzes.
3. Student evaluation form for live lab performance objectives.
4. Safe work habits.
5. Hands on experience.
6. Attendance.
7. Class participation.
8. Current events.
9. Assigned readings and questions.

OTHER REFERENCES

REFERENCES FOUND IN COLLEGE LIBRARY:

For Jamie, (Videorecording), Visucom Productions, 1980. (Automobiles--Child Restraint Systems)

Course Competency/Assessment Methods Matrix

ATO 2240 - Automotive Accessories		Assessment Options																																	
For each competency/outcome place an "X" below the method of assessment to be used.	Assessment of Student Learning	Article Review	Case Studies	Group Projects	Lab Work	Oral Presentations	Pre-Post Tests	Quizzes	Written Exams	Artifact Self Reflection of Growth	Capstone Projects	Comprehensive Written Exit Exam	Course Embedded Questions	Multi-Media Projects	Observation	Writing Samples	Portfolio Evaluation	Real World Projects	Reflective Journals	Applied Application (skills) Test	Oral Exit Interviews	Accreditation Reviews/Reports	Advisory Council Feedback	Employer Surveys	Graduate Surveys	Internship/Practicum /Site Supervisor Evaluation	Licensing Exam	In Class Feedback	Simulation	Interview	Written Report	Assignment			
	Direct/ Indirect	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	I	I	I	I	D	D									
Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.																																			
Test the charging system output.					X			X	X																										
Perform an alternator diode test on the oscilloscope and interpret the patterns.					X			X	X																										
Identify electrical circuit symbols.								X	X																										
Trace wiring diagrams to solve electrical circuit problems.					X			X	X																										
Locate grounds and shorts by using a short circuit tester.					X			X	X																										
Repair defective wiring found on a vehicle.					X			X	X																										

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Test electrical circuits with General Motors equipped engine and air conditioning diagnostic connectors.				X			X	X																								
Adjust headlights to meet state inspection standards.				X			X	X																								
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Inspect and service sending units with an ohmmeter.				X																												
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Diagnose speed control component malfunctions.				X		X	X																										
Inspect and service safety and warning systems.				X																													
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