

AUTO FUNDAMENTALS

DATE:

INDUSTRY SECTOR: Transportation Sector

PATHWAY: Systems Diagnostics, Service and Repair

CALPADS TITLE: Intermediate Systems Diagnostics, Service, and Repair (Concentrator)

CALPADS CODE: 8531

HOURS:

Total	Classroom	Laboratory/CC/CVE
180	76	104

JOB TITLE	O*NET CODE	JOB TITLE	O*NET CODE
Automotive Service Technicians and Mechanics	49-3023.00	Automotive Master Mechanics	49-3023.01
Automotive Engineers	17-2141.02	Parts Salespersons	41-2022.00
Automotive Specialty Technicians	49-3023.02		

COURSE DESCRIPTION:

This course is for 9th through 12th grade students with priority given to those students expressing and interest in pursuing a career in the automotive industry.

A-G APPROVAL:

No

ARTICULATION:

None

DUAL ENROLLMENT:

None

PREREQUISITES:

None

METHODS OF INSTRUCTION

- Direct instruction
- Group and individual applied projects
- Multimedia
- Demonstration
- Field trips
- Guest speakers

STUDENT EVALUATION:

- Student projects
- Written work
- Exams
- Observation record of student performance
- Completion of assignment

INDUSTRY CERTIFICATION:

- None

RECOMMENDED TEXTS:

- AUTO UPKEEP

PROGRAM OF STUDY

Grade	Fall	Spring	Year	Course Type	Course Name
9, 10, 11, 12				Concentrator	AUTO FUNDIMENTALS
11, 12				Capstone	ADVANCED AUTO

I.	SECTION I – INTRODUCTION AND ORIENTATION	CR	Lab/ CC	Standards
	<ul style="list-style-type: none"> A. Course Outlines B. Automotive Pathway Overview C. ASE Certification D. The automotive business E. Basic shop operation 	3	0	<p>Academic: RLST: 11-12.10, 11-12.3 WS: 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5, 6, 7, 8 PS: PS3</p> <p>CTE Anchor: Communications: 2.1, 2.2 Technology: 4.4, 4.5 Ethics and Legal Responsibilities: 8.1</p> <p>CTE Pathway: C1.1</p>
II.	GENERAL SHOP SAFETY	CR	Lab/ CC	Standards
	<ul style="list-style-type: none"> A. Shop map B. Safety equipment and locations C. Shop equipment safety D. Hand and power tool safety E. Emergency equipment F. Hazardous materials (MSDS) G. Safety Test 	10	2	<p>Academic: RLST: 11-12.10, 11-12.3 WS: 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5, 6, 7, 8</p> <p>CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4 Leadership and Teamwork: 9.1, 9.2, 9.3 Technical</p>

				Knowledge and Skills: 10.1, 10.2, 10.3, 10.4 CTE Pathway: C1.1, C1.2, C1.3, C1.4, C2.1, C2.2, C2.3, C2.4, C2.5, C2.6, C2.7
III.	TOOLS AND EQUIPMENT	CR	Lab/CC	Standards
	A. Tool and Equipment Identification B. Precision measuring · Micrometers	3	4	Academic: RLST: 11-12.3 WS: 11-12.10, 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5, 6, 7, 8 PS: PS3.A CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4 Leadership and Teamwork: 9.1, 9.2, 9.3 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.4 CTE Pathway: C1.4, C1.3, C1.2, C1.1, C2.2, C2.1, C2.7, C2.6, C2.5, C2.4, C2.3
IV.	FASTENERS AND THREAD REPAIR	CR	Lab/CC	Standards

	<p>A. Fasteners</p> <p>B. Restoring threads</p>	3	4	<p>Academic: RLST: 11-12.10, 11-12.3 WS: 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5, 6, 7, 8 PS: PS3</p> <p>CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4</p> <p>CTE Pathway: C2.2</p>
V.	GENERAL ENGINE SYSTEMS	CR	Lab/CC	Standards
	<p>A. The two-stroke and four-stroke cycle engines</p> <p>B. Introduction to electronic shop manuals · Mitchell On-Demand and Mitchell Shop Management</p> <p>C. Automobile owner's manual</p> <p>D. Getting to know your car</p> <p>E. Under hood inspection</p>	8	5	<p>Academic: RLST: 11-12.10, 11-12.3 WS: 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5, 6, 7, 8 PS: PS3</p> <p>CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.1, 6.2, 6.3, 6.4,</p>

				6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4 Leadership and Teamwork: 9.1, 9.2, 9.3 CTE Pathway: C1.4, C1.1, C1.3, C2.1, C2.2, C2.3, C2.4, C2.5, C2.7, C2.6, C4.1, C4.2, C4.3
VI.	BASIC ENGINE DIAGNOSTICS	CR	Lab/CC	Standards
	A. Using a vacuum gauge B. Spark tester C. Compression test D. Leak-down test E. Scan-tool	3	5	Academic: RLST: 11-12.10, 11-12.3 WS: 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5, 6, 7, 8 PS: PS3 CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4 Leadership and Teamwork: 9.1, 9.2, 9.3 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.4 CTE Pathway: C1.4, C1.3, C1.2, C1.1, C2.2, C2.1,

				C2.7, C2.5, C2.6, C2.4, C2.3, C4.3, C4.2, C4.1
VII.	INSPECTING THE VEHICLE	CR	Lab/ CC	Standards
	<p>A. How to lift a vehicle properly</p> <ul style="list-style-type: none"> · Lift · Jack and jack stands <p>B. Service intervals and preventative maintenance</p>	3	5	<p>Academic: RLST: 11-12.10, 11-12.3 WS: 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5, 6, 7, 8 PS: PS3</p> <p>CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3 Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4 Leadership and Teamwork: 9.1, 9.2, 9.3 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.4</p> <p>CTE Pathway: C1.4, C1.1, C1.2, C1.3, C2.1, C2.2, C2.3, C2.4, C2.6, C2.5, C2.7, C4.1, C4.2, C4.3</p>
VIII.	ENGINE LUBRICATION MAINTENANCE DIAGNOSIS AND SERVICE	CR	Lab/ CC	Standards
	<p>A. Engine oil and lubrication systems</p> <p>B. Oil changing</p> <p>C. Under Vehicle Inspection</p>	5	12	<p>Academic: RLST: 11-12.10, 11-12.3 WS: 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5,</p>

				6, 7, 8 PS: PS3 CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4 Leadership and Teamwork: 9.1, 9.2, 9.3 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.4 CTE Pathway: C1.4, C1.3, C1.2, C1.1, C2.2, C2.1, C2.7, C2.5, C2.6, C2.4, C2.3, C4.2, C4.3, C4.1
IX.	ENGINE COOLING SYSTEMS	CR	Lab/ CC	Standards
	A. Cooling system service and operation B. Cooling system pressure testing	5	12	Academic: RLST: 11-12.10, 11-12.3 WS: 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5, 6, 7, 8 CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2,

				5.3, 5.4 Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4 Leadership and Teamwork: 9.1, 9.2, 9.3 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.4 CTE Pathway: C1.1, C1.2, C1.3, C1.4, C2.1, C2.2, C2.3, C2.4, C2.6, C2.5, C2.7, C4.1, C4.2, C4.3
X.	DRIVETRAIN SYSTEMS	CR	Lab/ CC	Standards
	A. Service transmissions B. Manual transmissions C. Automatic transmissions D. Transfer cases E. Differentials	3	10	Academic: RLST: 11-12.10, 11-12.3 WS: 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5, 6, 7, 8 PS: PS3 CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4 Leadership and Teamwork: 9.1, 9.2, 9.3

				Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.4 Demonstration and Application: 11.4 CTE Pathway: C1.4, C1.2, C1.3, C1.1, C2.1, C2.7, C2.6, C2.5, C2.4, C2.3, C2.2, C4.2, C4.1, C4.3
XI.	BRAKING SYSTEMS	CR	Lab/CC	Standards
	A. Disk vs. drum brakes B. Basic brake inspection C. Lug nuts and torque wrench	5	15	Academic: RLST: 11-12.10, 11-12.3 WS: 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5, 6, 7, 8 PS: PS3 CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4 Leadership and Teamwork: 9.1, 9.2, 9.3 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.4 CTE Pathway: C1.4, C1.3, C1.1, C1.2, C2.1, C2.2, C2.3, C2.4, C2.5, C2.6, C2.7, C4.3, C4.1, C4.2

XII.	TIRES AND SUSPENSION SYSTEMS	CR	Lab/ CC	Standards
	<p>A. Tire construction and care</p> <p>B. Tire mounting and balancing procedures</p> <p>C. Tire mounting and dismounting</p> <p>D. Suspension system operation</p> <p>E. Lubricate suspension system and drive-train</p>	5	10	<p>Academic:</p> <p>RLST: 11-12.10, 11-12.3</p> <p>WS: 11-12.4</p> <p>A-CED: 4</p> <p>A-REI: 1</p> <p>SEP: 1, 2, 3, 4, 5, 6, 7, 8</p> <p>PS: PS3</p> <p>CTE Anchor:</p> <p>Communications: 2.1, 2.2, 2.3, 2.4</p> <p>Career Planning and Management: 3.1, 3.2, 3.3</p> <p>Technology: 4.4, 4.5</p> <p>Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4</p> <p>Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7</p> <p>Responsibility and Flexibility: 7.6, 7.7, 7.8</p> <p>Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4</p> <p>Leadership and Teamwork: 9.1, 9.2, 9.3</p> <p>Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.4</p> <p>CTE Pathway:</p> <p>C1.3, C1.2, C1.4, C1.1, C2.1, C2.7, C2.6, C2.5, C2.4, C2.3, C2.2, C4.2, C4.1, C4.3</p>
XIII.	BASIC ELECTRICAL CIRCUITS	CR	Lab/ CC	Standards
	<p>A. Ohm's Law</p> <p>B. Series and parallel circuits</p> <p>C. Building a test light</p> <p>D. Wiring diagrams</p>	15	5	<p>Academic:</p> <p>RLST: 11-12.10, 11-12.3</p> <p>WS: 11-12.4</p> <p>A-CED: 4</p> <p>A-REI: 1</p> <p>SEP: 1, 2, 3, 4, 5, 6, 7, 8</p> <p>PS: PS3</p> <p>CTE Anchor:</p> <p>Communications:</p>

				2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4 Leadership and Teamwork: 9.1, 9.2, 9.3 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.4 CTE Pathway: C1.4, C1.3, C1.1, C1.2, C2.1, C2.2, C2.3, C2.4, C2.5, C2.6, C2.7, C4.1, C4.3, C4.2
XIV.	ENGINE ELECTRICAL SYSTEMS	CR	Lab/CC	Standards
	A. Battery, charging and starting systems B. Battery load test C. Charging system test D. Starting system test E. Lighting systems	5	15	Academic: RLST: 11-12.10, 11-12.3 WS: 11-12.4 A-CED: 4 A-REI: 1 SEP: 1, 2, 3, 4, 5, 6, 7, 8 PS: PS3 CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3 Technology: 4.4, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.1, 6.2, 6.3, 6.4,

			6.5, 6.6, 6.7 Responsibility and Flexibility: 7.6, 7.7, 7.8 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.4 Leadership and Teamwork: 9.1, 9.2, 9.3 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.4 CTE Pathway: C1.4, C1.2, C1.3, C1.1, C2.1, C2.6, C2.7, C2.2, C2.3, C2.4, C2.5, C4.1, C4.2, C4.3
--	--	--	--

Entered by:

District: Santa Maria Joint Union High School District
 Contact: MATT ALMAGUER, INSTRUCTOR
 Phone: 805-310-6758
 Email: MALMAGUER@SBCEO.ORG