SAN LEANDRO UNIFIED SCHOOL DISTRICT
COURSE PROPOSAL: Course of Study
SECTION A. COVER PAGE

1. Course Title: Automotive Technology 1	7. **Action** ❑ New Course X Course Revision
2. Date Submitted: 1/20/17	8. **Grade Level(s)** ▢ 6 ▢ 9 X11 ▢ 7 X10 X12 ▢ 8
3. **Transcript Title/Abbreviation**(s) Auto 1	9. **Prerequisites** (Please list.) ▢ Required ▢ Recommended Pass safety test
4. **Transcript Course Code/Course Number** :	10. Seeking Program Distinction? ▢ YES (Check one below.) XNO ▢Honors ▢ AP ▢Other
5. Subject Area CTE	11. Is this a CTE course? X YES If YES, complete Section C
6. Department Career Technical	12. Previously approved by UC? YES X NO ▢ NA for 6th-8th
13. UC ELIGIBILITY Already eligible? ▢ NA for 6th-8th ▢YES XNO a ▢ b▢ c▢ d▢ e▢ f▢ g▢ Proposing eligibility?▢ NA for 6th-8th XYES ▢NO a ▢ b▢ c▢ d▢ e▢ f▢ gX	14. Unit Value/Course Credit/Length of Course ▢ 0.5 (semester or half-year X 1.0 (one year equivalent) ▢ 2.0 (two-year equivalent) ▢ Other
15. School Contact and Course Developer Name: Andy Shyers Phone: Email: ashyers@slusd.us Position: Teacher	
16. Approval Signatures: Principal:	Approval Date: 3/13/17 3/13/17
	DISTRICT OFFICE USE ONLY Date approved by Board Curriculum Committee 4/3/17 Date approved by Board

SECTION B. COURSE CONTENT

17. Course Description

Beginning of a multi-year series of Automotive Courses starting at SLHS and culminating at the Eden Area ROP Center. This course introduces students to basic skills required in understanding, inspecting, testing, and repairing automobiles. Topics include Auto Shop Safety, Tools and Equipment, Information Retrieval, Automotive Systems, Diagnosis, and Repair. Students will have the opportunity to work in an automotive shop environment to demonstrate their skills.

Systems Diagnostics, Service, and Repair Pathway

The Systems Diagnostics, Service, and Repair career pathway prepares students for postsecondary education and employment in the transportation industry, which includes but is not limited to motor vehicles, rail systems, marine applications, and small-engine and specialty equipment.

Occupations Associated w/ this Pathway	Technician, Service Adviser, Parts Technician, Line Technician, Maintenance Worker, Engineer, Technical Trades

18. Course Goals and/or Major Student Outcomes

Course Goals	Introduce students to the skills required to inspect, test, and repair automobiles. The class is intended to be broad based. Concepts taught are valuable to the student pursuing the profession or solely interested in maintaining their personal vehicles.

19. Course Standards

CTE Knowledge and Performance Anchor Standards

1. Academics Apply appropriate academic standards required for successful completion of the Transportation sector pathway leading to postsecondary education and employment. Refer to the Transportation alignment matrix for standard ID.
2. Communications Acquire and accurately use terminology and protocols associated with the Transportation sector pathway. Demonstrate the ability to use these effectively in oral, written and multimedia formats at a level ready for career or college.
3. Career Planning and Management Integrate career information from multiple sources and make informed decisions to related personal career

plans and goals.
4. Technology Use contemporary and emerging technology in the Transportation sector to produce products, solve problems and provide services. Emphasis on using this technology in a changing workplace environment.
5. Problem Solving and Critical Thinking Conduct research to create alternative solutions to solve a problem using critical and creative thinking, logical reasoning, analysis, inquiry, and problem solving techniques.
6. Health and Safety Understand and demonstrate proper health and safety procedures. Apply appropriate safety policies, regulations and practices. Determine key symbols, terms, and domain specific words related to maintaining a safe workplace environment in the Transportation sector.
7. Responsibility and Flexibility Initiate and participate in collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the workplace and community.
8. Ethics and Legal Responsibilities Practice professional, ethical, and legal behavior. Respond thoughtfully to diverse perspectives and resolve contradictions in a manner consistent with applicable laws, regulations, and organizational norms.
9. Leadership and Teamwork Work with peers to promote an environment allowing for creative and potentially divergent perspectives. Demonstrate both effective leadership skills and teamwork related to decision making and conflict resolution.
10. Technical Knowledge and Skills Understand and apply essential knowledge and technical skills common to all pathways in the Transportation sector. Follow proper procedures when performing tests or technical tasks.
11. Demonstration and Application Demonstrate and apply the knowledge and skills contained in the Transportation anchor standards, pathway standards, and performance indicators in the classroom, lab, and/or workplace setting.

Systems Diagnostics, Service, and Repair Pathway Standards:

C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.

C1.1 Know and understand common environmental conservation practices and their applications.

C1.2 Practice the safe handling and storage of chemicals and hazardous wastes in accordance with Material Safety Data Sheets (MSDS) and the requirements of local, state, and federal regulatory agencies.

C1.3 Understand the way in which waste gasses, emissions, and other environmentally destructive substances are generated and the effects of these substances on the environment.

C1.4 Use appropriate personal protective equipment and safety practices.

C1.5 Evaluate the advantages and disadvantages of existing, new, and emerging systems and the effects of those systems on the environment.

C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.

C2.1 Recognize the importance of calibration processes, systems, and techniques using various measurement and testing devices.

C2.2 Demonstrate and use appropriate tools and equipment—such as wrenches, sockets, and pliers—to diagnose, service, repair, and maintain systems and components.
C2.3 Use tools, equipment, and machines to safely measure, test, diagnose, and analyze components and systems (e.g., electrical and electronic circuits, alternating- and direct-current applications, fluid/hydraulic and air/pneumatic systems).
C2.4 Select and use the appropriate measurement device(s) and use mathematical functions necessary to perform required fabrication, maintenance, and operation procedures.
C2.5 Use measurement scales, devices, and systems, such as dial indicators and micrometers, to design, fabricate, diagnose, maintain, and repair vehicles and components following recommended industry standards.
C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.
C2.7 Test and analyze the elements of precision measuring using standard and metric systems.
C3.0 Use scientific principles in relation to chemical, mechanical, and physical functions for various engine and vehicle systems.
C3.1 Describe the operating principles of internal and/or external combustion engines.
C3.2 Describe the function and principles of air-conditioning and heating systems.
C3.3 Describe the basic principles of pneumatic and hydraulic power and their applications.
C3.4 Describe the applications of alternative power sources.
C3.5 Practice the basic principles of electricity, electronics and electrical power generation, and distribution systems.
C3.6 Explain the principles of converting energy from one form to another.
C3.7 Perform necessary procedures to maintain, diagnose, service, and repair vehicle systems and malfunctions.
C4.0 Perform and document maintenance procedures in accordance with the recommendations of the manufacturer.
C4.1 Communicate the procedures and practices of various manufacturers regarding service, repair, and maintenance schedules.
C4.2 Demonstrate how to properly document maintenance and repair procedures in accordance with applicable rules, laws, and regulations (e.g., Bureau of Auto Repair [BAR], Occupational Safety and Health Administration [OSHA], and the California Air Resources Board [ARB]).
C4.3 Use reference books, technical service bulletins, and other documents and materials related to the service industry available in print and through electronic retrieval systems to accurately diagnose and repair systems, equipment, and vehicles.
C4.4 Complete a work order, including customer information, description of repairs, and billing information, in accordance with applicable rules, laws, and regulations.
C5.0 Apply and understand appropriate business practices.
C5.1 Identify work-related systems common to the transportation service industry.
C5.2 Know the laws and regulations applicable to recordkeeping and the appropriate handling and disposal of hazardous materials.
C5.3 Explain the importance of and the procedures for maintaining accurate records (e.g., business licenses, repair orders, billing and tax records).
C5.4 Practice the concept and application of accepted ethical business practices.
C5.5 Practice the concept and application of acceptable customer relations practices.
C5.6 Recognize, analyze, and evaluate the need for maintenance of components and systems and the conditions under which service and maintenance are required.
C6.0 Demonstrate the application, operation, maintenance, and diagnosis of engines, including but not limited to two- and four-stroke and supporting subsystems.
C6.1 Perform general engine maintenance, diagnosis, service, and repair in accordance with portable national industry standards, such as the National Automotive Technicians

Education Foundation and the Equipment and Engine Training Council.
C6.2 Maintain, diagnose, service, and repair lubrication and cooling systems.
C6.3 Practice how to maintain, diagnose, and repair computerized engine control systems and other engine-related systems.
C6.4 Maintain, diagnose, service, and repair ignition, electronic, and computerized engine controls and fuel management systems.
C7.0 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.
C7.1 Practice maintenance, diagnosis, and repair of electrical systems.
C7.2 Maintain, diagnose, repair, and service batteries.
C7.3 Demonstrate maintenance, diagnosis, service, and repair of starting and charging systems.
C7.4 Diagnose, service, and repair lighting systems.
C7.5 Diagnose, service, and repair heating and air-conditioning systems and components.
C7.6 Diagnose, service, and repair horns, wipers/washers, and other accessories.
C7.7 Perform necessary procedures to maintain, diagnose, service, and repair vehicle electrical and electronic systems and malfunctions.
C8.0 Demonstrate the function and principles of automotive drivetrain, steering and suspension, brake, and tire and wheel components and systems in accordance with national industry standards.
C8.1 Describe how to maintain, diagnose, service, and repair hydraulic and power assist systems.
C8.2 Describe the function and operation of automatic and manual transmissions and transaxles.
C8.3 Diagnose, service, and repair disc brakes, drum brakes, antilock brakes, and other brake systems as developed.
C8.4 Diagnose, service, and repair steering and suspension systems.
C8.5 Interpret tire and rim sizing to select appropriate wheels and tires for vehicles.
C8.6 Maintain, diagnose, service, and repair under-vehicle systems and malfunctions.

***College and Career Readiness Standards**:*

- Reading

Key Ideas and details

1.Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
2.Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
3.Analyze how and why individuals, events, or ideas develop and interact over the course of a text.

Craft and Structure

4.Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
5.Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.
6.Assess how point of view or purpose shapes the content and style of a text.

Integration of Knowledge and Ideas

7.Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.
8.Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

9.Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of reading and Level of text Complexity

10.Read and comprehend complex literary and informational texts independently and proficiently

- Writing

Text types and Purposes

1.Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.

2.Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

3.Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details and well-structured event sequences.

Production and distribution of Writing

4.Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

5.Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

6.Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build and Present Knowledge

7.Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

8.Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

9.Draw evidence from literary or informational texts to support analysis, reflection, and research.

Range of Writing

10.Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audience

20. Course Outline

Course Outline-Units	Key Assignments/Projects	Anchor Standards	Pathway Standards	Common Core Standards
1. Introduction to Auto Shop and Auto Shop Safety	1.1 Beginning Auto overview 1.2 Shop procedures and policies including work ethic and grading policies 1.3 Personal safety rules and procedures 1.4 Safety rules and procedures required for use of tools and equipment 1.5 Locate and demonstrate knowledge of MSDS sheets 1.6 Unique Safety considerations in Transportation 1.7 Pass Safety Test w/ 90% minimum	2.0, 6.0, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 7.0, 7.2, 7.7, 8.0, 8.2, 8.3, 8.4, 8.5, 9.3, 10.1, 11.0, 11.2, 11.5	C1.1, 1.2, 1.3, 1.4, 2.3, 4.2	LS 9-10, 11-12.6 RSTS 9-10, 11-12.4 SLS 9-10, 11-12.1 SLS 11-12.1d SLS 11-12.1b WS 11-12.6
2. Tools and Equipment	2.1 Hand and power tool ID 2.2 Hand and power tool use in Transportation 2.3 Fastener, Sealants, and Adhesives 2.4 Picking proper tool for the job 2.5 Demonstrating proper use, cleaning, maintenance and storage of tools.	1.0, 5.1, 5.2, 5.3, 6.3, 6.4, 6.5, 10.1, 11.1	C2.1, 2.2, 2.3, 2.4, 2.5, 2.7	WS 11-12.7 RSTS 9-10, 11-12.4 WS 11-12.6
3. Automotive Manuals and Data Systems	3.1 Vehicle ID 3.2 Identify sources of service information 3.3 Trade abbreviations	2.3, 2.6, 4.1, 4.2, 4.3, 4.5, 8.2, 8.3	C4.1, 4.2, 4.3, 5.6	LS 9-10, 11-12.6 WS 11-12.6 SLS 11-12.1d

	3.4 Demonstrate use various types of service information to diagnose problems and complete tasks			
4. Automotive Systems and Components	4.1 RWD Systems and Component Part ID and Function 4.2 FWD Systems and Component Part ID and Function 4.3 Demonstrate a basic understanding of the workings of an entire automobile	2.3, 2.4, 2.5 4.2, 4.5, 5.1, 5.3, 5.4, 6.4, 6.6, 7.4, 9.1, 9.3, 10.1, 11.1	C1.1, 1.2, 1.3, 1.4, 1.5, 3.1, 3.2, 3.3, 3.4, 3.5, 4.3, 5.6	LS 9-10, 11-12.6 WS 11-12.6 WS 11-12.7 RSTS 9-10, 11-12.4 SLS 9-10, 11-12.1 SLS 11-12.1b
5. Diagnosis with the Dashboard	5.1 ID systems monitored 5.2 ID and interpret gauge readings and indicator lamps 5.3 ID and prevention of potential problems 5.4 Demonstrate skills upon completion 5.5 Introduction of some advanced diagnostic tools	2.3, 2.4, 2.5 4.2, 4.5, 5.1, 5.3, 5.4, 6.4, 6.6, 7.4, 9.1, 9.3, 10.1, 11.1	C1.4, 2.1, 2.3, 2.6, 3.1, 3.3, 3.5, 3.7, 5.6	LS 9-10, 11-12.6 WS 11-12.6 WS 11-12.7 RSTS 9-10, 11-12.4 SLS 9-10, 11-12.1 SLS 11-12.1b
6. Automotive Fluids and Lubricants Identification and Purpose	6.1 Basic fluid properties 6.2 ID and selection of proper fluids 6.3 Location of fluids in the automobile 6.4 Hazardous waste regulations & disposal	2.4, 4.1, 5.2, 5.4, 6.1, 6.2, 6.3, 8.2, 8.3, 8.4	C1.1, 1.2, 1.4, 2.2, 2.6, 3.7, 4.1, 4.2, 5.2, 5.6, 6.1, 6.2, 7.1, 8.1	LS 9-10, 11-12.6 WS 11-12.6 WS 11-12.7 RSTS 9-10, 11-12.4 SLS 11-12.1d
7. Basic "Gas Stop" inspection and maintenance (on the tarmac)	7.1 Emphasis on preventive maintenance 7.2 Comprehensive external & under hood inspection 7.3 Tire inspection and maintenance 7.4 Fluid level inspection and maintenance 7.5 Demonstrate proper inspection and maintenance	2.4, 4.1, 5.2, 5.4, 6.1, 6.2, 6.3, 8.2, 8.3, 8.4, 11.2	C1.1, 1.2, 1.4, 2.2, 2.6, 3.7, 4.1, 4.2, 5.2, 5.6, 6.1, 6.2, 7.1, 8.1	LS 9-10, 11-12.6 WS 11-12.6 WS 11-12.7 RSTS 9-10, 11-12.4 SLS 11-12.1d
8. Automotive Measurement	8.1 Measuring systems 8.2 Reading rulers 8.3 Reading calipers, feeler gauges, & micrometers 8.4 Reading voltmeters 8.5 Introduction to Dynamometer use	4.1, 5.1, 5.2, 5.4, 6.3, 6.6, 8.1, 9.7, 10.1	C1.4, 2.1, 2.2, 2.3, 2,4, 2,5, 2.6, 2.7, 3.1, 3.3, 3.5, 3.6, 4.1, 4.3, 5.6, 7.1	WS 11-12.6 WS 11-12.7 RSTS 9-10, 11-12.4 SLS 11-12.1b SLS 11-12.1d WS 11-12.6
9. Vehicle Inspection & Preventive Maintenance (w/ lift)	9.1 Specific safety inspection 9.2 Tire Rotation 9.3 Brake inspection 9.4 Fluid & filter replacement 9.5 Overall car evaluation	2.4, 4.1, 5.2, 5.4, 6.1, 6.2, 6.3, 8.2, 8.3, 8.4, 11.2	C1.1, 1.2, 1.4, 2.2, 2.6, 3.7, 4.1, 4.2, 5.2, 5.6, 6.1, 6.2, 7.1, 8.1	LS 9-10, 11-12.6 WS 11-12.6 WS 11-12.7 RSTS 9-10, 11-12.4 SLS 11-12.1d
10. Tires & Wheels	10.1 Tire safety, construction & characteristics 10.2 Tire ID 10.3 Wheel sizing and construction 10.4 Demonstrate of wheel removal and installation including tools and procedure 10.5 Diagnosis & service of tires and wheels	4.1, 5.1, 5.2, 5.3, 5.4, 6.1, 6.3, 6.4	C1.1, 1.2, 1.4, 2.2, 2.5, 2.6, 2.7, 3.6, 3.7, 4.1, 4.2, 4.3, 5.2, 5.6, 6.1, 7.1, 8.1, 8.4, 8.5	WS 11-12.6 WS 11-12.7 RSTS 9-10, 11-12.4
11. Automotive Engines	11.1 Engine ID 11.2 Four-cycle combustion process 11.3 Engine systems, sub-assemblies, major components 11.4 Specifications & measurement 11.5 Mechanical problems diagnosis & service	2.4, 4.1, 5.1, 5.2, 6.1, 6.3, 6.6, 8.1, 8.2, 8.3, 8.4, 11.2	C1.2, 1.4, C2.1, 2.2, 2.3, 2.5, 3.1, 3.6, 4.1, 4.2, 4.3, 6.1, 6.2	LS 9-10, 11-12.6 WS 11-12.6 WS 11-12.7 RSTS 9-10, 11-12.4 SLS 11-12.1d
12. Automotive Cooling Systems	12.1 Components 12.2 Principles of Operation 12.3 Coolant selection 12.4 Diagnosis & Service	2.4, 4.1, 5.1, 5.2, 5.3, 5.4, 6.1, 6.3, 6.4	C1.2, 1.4, 2.1, 2.2, 2.3, , 2.4, 2.5, 2.6, 3.1, 3.6, 3.7, 4.1, 4.3, 5.2, 5.6, 6.1, 6.2	LS 9-10, 11-12.6 WS 11-12.6 WS 11-12.7 RSTS 9-10, 11-12.4
13. Automotive Brakes	13.1 Hydraulic principles & system design 13.2 Detailed inspection 13.3 Diagnosis & repair of disk & drum brakes 13.4 Anti-lock brake principles	2.4, 4.1, 5.1, 5.2, 5.3, 5.4, 6.1, 6.3, 6.4	C1.1, 1.2, 1.4, 2.0, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 3.3, 3.6, 3.7, 4.2, 4.3, 4.4, 5.6, 8.1, 8.3	LS 9-10, 11-12.6 WS 11-12.7 RSTS 9-10, 11-12.4
14. Electronics in the	14.1 Voltage, Current, Resistance	2.4, 4.1, 5.1, 5.2,	C1.2, 1.4, 2.3,	LS 9-10, 11-12.6

Automobile	14.2 Circuits 14.3 Computers in the Automobile 14.4 Principles, design, and operation of Batteries, Charging Systems, Starting Systems 14.5 Jump stating a vehicle 14.6 Maintenance 14.7 Diagnosis & Service	5.3, 5.4, 6.3	2.6, 3.5, 3.7, 7.1, 7.4, 7.7	WS 11-12.6 WS 11-12.7 RSTS 9-10, 11-12.4
15. Application for Employment	15.1 Employer expectations 15.2 Job applications 15.3 Resume preparation 15.4 Interview skills	2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.8, 3.9, 11.1, 11.2	C5.0	LS 9-10, 11-12.6 SLS 11-12.2

21. Instructional Materials

Instructional Materials/Textbooks	Text: Modern Automotive Technology, Duffy Database: AllData (online automotive information system) Handouts/Worksheets

22. Instructional Methods and/or Strategies

Instructional Strategies	Information on automotive system's function and repair will be presented in a variety of formats including, but not limited to: ● Lecture, multimedia, and classroom discussion. ● Textbook reading, writing, and research assignments. ● Demonstrations followed by project based learning in the Automotive Shop where student teams will complete worksheets guiding them through tasks directly related to learning the skills of Automotive Diagnostics & Service. ● Competitions and project based learning that allow students to test their skills with their peers and the instructor. ● Guest speakers and field trips that enable students to see real world application of skills and learn the expectations of industry. ● Job shadowing to qualified students.

23. Assessment Methods and/or Tools

- Warm Ups
- Classwork/ Homework
- Written Tests
- Practical Tests
- Shop Work and Project Based Learning
- Attitude and Participation

24. Grading Policy

Grading will follow the San Leandro Unified School District's policy.

25. Context for Course

Automotive Technology I is the first course in a two course pathway that is a Perkins funded Career Technical Education Pathway. This pathway aligns to Eden Area Regional Occupational Program. This course is articulated with Eden Area ROP which is articulated with Chabot College.