

Coalinga High

Title: ROP Diesel Engine Technology

Course Description (describe the course, focusing on content):

Diesel Equipment Technology is designed to train students for employment opportunities available within the agricultural/industrial industry. This course emphasizes skills necessary in the field of diesel equipment mechanics where students will learn major overhaul and tune-up diesel engines. The course will also focus on skills in power machinery and small engine repair and maintenance with strong emphasis on safety, tool and equipment usage and preventative maintenance procedures. The development of leadership and employability skills is emphasized throughout the course. This advanced course follows the Model Curriculum Standards and Frameworks for Agriculture Specialization in the Agricultural Mechanics Advanced Core Cluster.

Textbook (primary textbook if more than one is used) and Resources will include:

CDX, Various Videos

Instructional Methods

Methods of instruction will include, but are not limited to:

1. Direct instruction (lecture, reading, labs, and investigations, writing – reports, journals, analyses, essay – speaking, presentations, guest speakers).
2. Laboratory investigations and project using educational courseware and computer technology.
3. Team teaching including assisted instruction from university, business, and community partners.
4. Community – based research projects with professional mentors.
5. Use variety of instructional materials and resources including electronic media, professional journals and reference materials, textbooks and other print information.
6. Self-directed, cooperative, and collaborative learning to increase responsibility of students for their own learning.
7. Student presentations, exhibits, and competitions – both team and individual.
8. Embedded assessment as a learning tool.
9. SDAIE (Specially Designed Academic Instruction in English).
10. Differentiated instruction of exceptional students.

Evaluation Procedures

II. Career Development	5				CMP 3.1, CMP3.2, CPM3.3,CMP3.4, CMP3.5, CMP 3.6					
A. Opportunities in Ag business management					CMP 3.1, CMP3.2, CPM3.3,CMP3.4, CMP3.5, CMP 3.6					
B. Occupational goal setting					CMP 3.1, CMP3.2, CPM3.3,CMP3.4, CMP3.5, CMP 3.6					
C. Occupational goal setting										
D. Work Values					ERL 8.3					
E. Self-assessment					CMP 3.6					
III. Equipment Mechanics	100	50	50							
A. Shop procedures					T4.1, T4.2, T4.3, T4.4					
B. Identification of tools										
C. Proper use of tools					T4.1, T4.2, T4.3, T4.4					
1. Basic mechanics hand tools					T4.1, T4.2, T4.3, T4.4					
2. Micrometers, dial indicators, bore gauges, telescoping gauges and calipers				A2.2, A2.4, A2.5						

3. Forklifts, hoists jacks and jack stands					T4.1, T4.2, T4.3, T4.4, TKS10.5, DA11.0					
4. Boil out tank steam cleans, parts tanks, cold tank cleaning, glass bead machines, and					T4.1, T4.2, T4.3, T4.4, TKS10.5, DA11.0					

Course Outline	CLRM Hrs	CC Hrs	CVE Hrs	Career Pathway Standards	CTE Foundation Standards	Core Competencies	Content Activities & Assessments	ELA Standards 9/10	ELA Standards 11/12	Math Standards
sand blasting										
5. Pullers, hydraulic presses, and arbor presses					T4.1, T4.2, T4.3, T4.4, TKS10.5, DA11.0					
6. Valve grinders, boring machines, and lathes					T4.1, T4.2, T4.3, T4.4, TKS10.5, DA11.0					
7. Air impact tools				A2.1, A2.2	T4.1, T4.2, T4.3, T4.4, TKS10.5, DA11.0					
8. Specialty tools				A2.1, A2.2	T4.1, T4.2, T4.3, T4.4, TKS10.5, DA11.0					
9. Drilling threading, and removal of broken bolts and threaded inserts				A2.2	T4.1, T4.2, T4.3, T4.4, TKS10.5, DA11.0					
10. Grinders and metal cutting equipment					T4.1, T4.2, T4.3, T4.4, TKS10.5, DA11.0					

11. Welding equipments					T4.1, T4.2, T4.3, T4.4, TKS10.5, DA11.0					
12. Sharpening and fitting tools				A2.1, A2.2	T4.1, T4.2, T4.3, T4.4, TKS10.5, DA11.0					
D. Fasteners					T4.1, T4.2, T4.3, T4.4					
1. Identification					T4.1, T4.2, T4.3, T4.4					
2. Copper tubing					T4.1, T4.2, T4.3, T4.4					
3. Brass fittings					T4.1, T4.2, T4.3, T4.4					
4. Hoses and fittings					T4.1, T4.2, T4.3, T4.4					
5. Hydraulic fittings and lines					T4.1, T4.2, T4.3, T4.4					
IV. Diesel Engines	100	50	50		S1.d					
A. General Information										
1. History of diesel engines development and fields of application					T4.3					
2. Comparison of diesel and gas engines										
3. Four stroke cycle					S1.d					

Course Outline	CLRM Hrs	CC Hrs	CVE Hrs	Career Pathway Standards	CTE Foundation Standards	Core Competencies	Content Activities & Assessments	ELA Standards 9/10	ELA Standards 11/12	Math Standards
engine design and operation principles										
4. Two stroke cycle engine design and operation principles										
5. Model, serial, and general identification system										
6. Information necessary for ordering parts				A5.3	PSCT5.1, PSCT5.3, PSCT5.5					
B. Basic engine cylinder block assembly design, component parts, disassembly, inspection, and reassembly					S1.d, PSCT5.1					
1. Cylinder block general description and servicing procedures					PSCT5.1, PSCT5.3, PSCT5.5					
2. Cylinder block and end plates and covers					PSCT5.1, PSCT5.3, PSCT5.5					
3. Cylinder liners					PSCT5.1, PSCT5.3, PSCT5.5					

4. Crankshaft and main bearings					PSCT5.1, PSCT5.3, PSCT5.5					
5. Flywheel, ring gear, clutch pilot bearing, flywheel housing and gear train cover										
6. Vibration damper										
7. Pistons and connection rods					PSCT5.1, PSCT5.3, PSCT5.5					
8. Timing gear train and camshaft										
9. Cylinder head and valves					PSCT5.1, PSCT5.3, PSCT5.5					
C. Lubrication systems										
1. Lubrication purpose, circulation, and distribution system										
2. Engine oil recommendations										
3. Oil filters and										

Course Outline	CLRM Hrs	CC Hrs	CVE Hrs	Career Pathway Standards	CTE Foundation Standards	Core Competencies	Content Activities & Assessments	ELA Standards 9/10	ELA Standards 11/12	Math Standards
strainers; purpose and application										
4. Oil cooler requirements					S3.a					

2. Fuel oil recommendations										
3. Transfer pumps										
4. Field instillation and service					S4.a, S5.b					
G. Engine Balancers										
1. Balancing requirements										
2. Balancer purpose, theory, and operating principles										
3. Balancer timing and servicing procedure										

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V. Equipment Operation	100	50	50		TKS10.5, DA11.0					
A. Safety					HS6.1, HS6.2, HS6.3, HS6.4					
1. Laws pertaining to agricultural Machinery					HS6.4					
2. Rules for safe operation					HS6.1, HS6.2, H.S6.3, HS6.4					
3. Pinch and grab points					HS6.3					

4. Roll Over Protection (ROPS)					HS6.3					
5. Stability and center of gravity										
6. Emergency start procedures										
B. Tractors					TKS10.5, DA11.0					
1. Introduction										
2. Daily maintenance and service					TKS10.5, DA11.0					
3. Starting and stopping procedures				A2.1, A2.2	TKS10.5, DA11.0					
4. Driving and backing				A2.1, A2.2	TKS10.5, DA11.0					
5. Speed control										
6. Ground and engine										
C. Tracklayers				A2.1, A2.2	TKS10.5, DA11.0					
1. Introduction										
2. Daily maintenance and service										
3. Starting and stopping procedures										
4. Driving and backing				A2.1, A2.2	TKS10.5, DA11.0					

5. Speed control				A2.1, A2.2	TKS10.5, DA11.0					
6. Ground and engine										
D. Hitching				A2.1, A2.2	TKS10.5, DA11.0					
1. 3 point hitches				A2.1, A2.2	TKS10.5, DA11.0					
2. Category selection and engagement and safety					HS6.1, HS6.2, HS6.3, HS6.4					
3. PTO connection and engagement and safety					HS6.1, HS6.2, HS6.3, HS6.4					
4. Auxiliary hydraulic connections										
E. Loaders				A2.1, A2.2	TKS10.5, DA11.0					

Course Outline	CLRM Hrs	CC Hrs	CVE Hrs	Career Pathway Standards	CTE Foundation Standards	Core Competencies	Content Activities & Assessments	ELA Standards 9/10	ELA Standards 11/12	Math Standards
1. Introduction										
2. Daily maintenance and service										
3. Safety and stability										
4. Operating and handling					TKS10.5, DA11.0					
F. Forklifts					TKS10.5, DA11.0					

1. Daily maintenance and service										
2. Safety and load handling					HS6.1, HS6.2, HS6.3, HS6.4					
3. Operation				A2.1, A2.2	TKS10.5, DA11.0					
4. Speed control and efficiency										
G. Trucks										
1. Starting and stopping										
2. Driving and backing										
3. Speed control hitching										
4. Daily maintenance and service										
VI. Safety And First Aid	20	5	5		HS6.1, HS6.2, HS6.3, HS6.4					
A. Safe work habits with equipment and tools										
B. Accident prevention										
C. Potential hazard identification				A1.0, A1.1						
D. Handling emergencies				A1.0, A1.1, A1.2, A1.3, A1.4, A1.5						

E. OSHA				A1.0, A1.1, A1.2, A1.3, A1.4, A1.5, A4.2						
F. Power machinery										
G. Servicing equipment										
VII. EMPLOYABILITY SKILLS	20				CMP3.5					
A. Career Paths										
1. Employment Opportunities										
2. Educational/ Certification Requirements					CPM3.1, CPM3.2, CPM3.3					
B. Sources of Job					CMP3.6					

Course Outline	CLRM Hrs	CC Hrs	CVE Hrs	Career Pathway Standards	CTE Foundation Standards	Core Competencies	Content Activities & Assessments	ELA Standards 9/10	ELA Standards 11/12	Math Standards
Information										
C. Communication Skills										
D. Employment Literacy					CMP3.2, CMP3.5					
1. Application					W2.5, CPM3.6					

2. Resume					CPM3.2, CPM3.3, CPM,3.6					
3. Cover Letter					W2.5, CPM3.6					
4. Interviews					LS2.4, CPM3.3, CPM3.4					
5. Grooming and Dress					CMP3.1, CPM3.2					
6. Follow Up Letter										
E. Job Retention Skills										
1. Team Work – Cooperation					CMP3.1, CPM3.2					
2. Ethics and Professionalism					CMP3.1, CPM3.2					
3. Work Habits and Ethics					CMP3.1, CPM3.2					
XII Leadership	14				LT9.1, LT9.2, LT9.3, LT9.5					
A. FFA Organization										
1. Contest/participation				A6.0	S5.a, S5.b					
2. Record books										
B. Communication skills					LT9.5					

C. Critical thinking/problem solving					M3.2, M3.3, PSCT5.0					
Total CLRM Hours	360									
Total CC Hours		155								
Total CVE Hours			155							