

SAM HOUSTON STATE UNIVERSITY  
COLLEGE OF SCIENCE AND ENGINEERING TECHNOLOGY  
DEPARTMENT OF AGRICULTURAL SCIENCES  
COURSE SYLLABUS  
AGET 4387  
AGRICULTURAL ENGINES AND TRACTORS  
3 CREDIT HOURS  
SPRING 2018

LOCATION OF CLASS AND LAB MEETING:

William R. Harrell Agricultural Engineering & Technology Center

CLASS TIME: TU: 12:00 –12:50    LAB TIME TU: 1:00 – 4:50

INSTRUCTOR: Joe E. Muller, Ph.D., Professor – Ag Engineering Technology

OFFICE: Ag Engineering Technology Center, Rm 106-C.

CONTACT INFORMATION:

AETC Office (936) 294-4877

E-mail: jemuller@shsu.edu

OFFICE HOURS: as posted or by appointment

COURSE DESCRIPTION: Principles of internal combustion engines; compression, ignition, lubrication, cooling and carburetion systems; and analysis and repair of agricultural tractors and their components are covered. Lecture will include technical information, procedures, discussion, and problem solving activities. Lab and field trips will include problems and hands-on activities relating to agricultural machinery.

COURSE OBJECTIVES: An understanding of the modern tractor and its systems is necessary for success in sales, customer relations, service, and operation of agricultural tractors and equipment produced today. Opportunity to develop knowledge and skills in servicing and repairing engines, and integrated electrical and hydraulic systems on agricultural equipment will be provided.

Upon completion of this course student should be able to:

1. Discuss current and future trends in the agricultural equipment industry.
2. Discuss operational principles and processes, and laws of thermodynamics for common types of internal combustion engines, including both 2-stroke and 4-stroke cycle engines with spark and compression ignition.
3. Define and use common terms used in the agricultural equipment industry.
4. Identify component parts in internal combustion engines and describe their function.
5. Read and understand manufacturer's service data and specifications.
6. Use common precision measuring tools and instruments to complete performance tests and evaluate components to make service recommendations and management decisions.
7. Develop parts list and labor requirement analysis for repair and maintenance jobs and make service recommendations and management decisions.
8. Prepare engines and power train parts and component for major overhaul.
9. Perform disassembly, major overhaul, and re-assembly.
10. Break-in an overhauled engine and adjust to meet manufacturer's specifications.
11. Discuss the principles of hydraulics and perform routine service and maintenance.
12. Discuss the principles of electronics and perform routine service and maintenance.

CLASSROOM & LABORATORY PROCEDURES, ACTIVITIES, AND REQUIRED SUPPLIES: Students are to comply with the safety policies and procedures as demonstrated and outlined in the Safety Instruction for Ag Engineering Technology Center Document.

Each student is required to wear safety glasses and appropriate clothing and shoes during all laboratory sessions. Students are not to operate tools and equipment until they have received proper training and are required to follow all appropriate industry safety procedures. Students will keep the laboratory clean and in order. Laboratory session will not be dismissed until all tools and equipment are returned to the proper storage location and the floor is properly clean and swept.

TEXTBOOK: (Required)

**Engine and Tractor Power** 4<sup>th</sup>. Edition, ISBN # 1-892769-42-5  
Goering and Hansen, ASABE, St. Joseph, MI.

**ENGINES** 12<sup>TH</sup> Edition, John Deere Publications, Moline, IL.

Additional References:

Textbook on CD **Agricultural Power and Machinery**, Jacobs, Harrell,  
& Shinn, CEV Multimedia, Lubbock, TX.

#### DEPARTMENT OF AGRICULTURAL SCIENCES ATTENDANCE POLICY:

1. Regular and punctual attendance is expected of each student in the Department of Agricultural Sciences at Sam Houston State University.
2. Each faculty member will keep a written record of student attendance.
3. If a student misses four or more classes, the student's grade may be reduced by one letter grade. Additional penalties will be up to the discretion of the professor.
4. Three unexcused or unjustified tardies or early departures are considered one absence.
5. Excused absences must be documented by the student with a letter of confirmation from the sponsoring student organization, professor or doctor. Exemptions will include participation in departmental activities when prior approval is attained from the Department Chair or the sponsoring professor.

#### LABORATORY ACTIVITIES:

One or more pieces of equipment may be disassembled for service and repair, observation, or demonstration in the laboratory. Each student is to take notes and maintain a lab notebook.

Safety, good housekeeping and proper use of tools and equipment will be stressed. Each student is to provide industrial quality eye protection (safety glasses), proper shoes and clothes for laboratory activities. Safety glasses and other appropriate PPE are to be worn at all times. Points may be subtracted from laboratory grades and or student dismissed from lab for repeated failure to wear proper eye protection and/or follow safety procedures or instructions. It is expected that students will clean the entire laboratory at the conclusion of each laboratory period. The laboratory will not be considered clean until all tools and equipment are properly shut-down and stored.

Students will keep the laboratory clean and in order. Lab will not be dismissed until all tools and equipment is returned to the proper storage location and the floor is properly clean and swept.

#### COURSE EVALUATION:

Exam # 1	150 pts
Exam # 2	150 pts
Exam # 3	150 pts
Class attendance and performance	100 pts
Lab work and assignments (random)	300 pts
Final Exam	150 pts

#### ADDITIONAL COURSE ASSIGNMENT FOR STUDENT TAKING COURSE FOR GRADUATE CREDIT

Each class member taking this course for graduate credit will be responsible for identifying a topic relevant to a new and emerging technology in agriculture engines and tractors. The student is to research the development of the topic and develop a research paper. Advanced approval of the topic area is required and will be granted on a first-come first-served basis. Information is to be written up in approved ten eight pages excluding any pictures, charts, graphs, references and bibliography. Each class member taking this course for graduate credit will then be responsible to give a class presentation and a laboratory demonstration if appropriate over the topic to the rest of the AGRI 4387-01 students. The presentation should be presented as if it was given to an advanced high school, adult education, or on-job continuing education training class.

No exams or assignments will be given at alternative times unless arrangements are made with the professor before the scheduled activity occurs.

1. At the discretion of the professor, up to a 10 % penalty may be assessed for late exams or assignments. At the discretion of the professor, a 100% essay make-up exam may be given.
2. Final Exam is comprehensive.

**FIELD TRIPS:** Field trips may be planned throughout the semester as student/instructor schedules and contacts with businesses and industries allow. Because of possible travel time from the SHSU campus, it may be that a field trip will take longer than normal class/lab schedules allow. If so, other class/lab release time may be given.

**ACADEMIC DISHONESTY AND DISRUPTIVE CONDUCT:** Students will refrain from behavior in the classroom or lab that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Students are prohibited from making offensive remarks, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engage in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, purchasing papers, collusion and the abuse of resource materials. Any such action will result in failing that exam, research paper, assignment, or the entire course, and a letter of explanation placed in the student's file.

Cellular telephones, text messengers, any communication function on laptop computers, and/or any other similar devices **must be turned off before class or lab begins**. Arrangements for handling potential emergency situations must be arranged before the class or lab period begins at the

discretion of the instructor. The use of any device that performs communication functions during any test period is prohibited. Such devices may not be used even for their calculator functions. Failure to comply with this policy could result in expulsion from the classroom or lab, or with multiple offenses, failure of the course. These devices should not be present during a test or should be stored securely in such a way that they cannot be seen or used. Even the visible presence of such a device during a test period may result in a zero for that test. The use of these devices during a test is considered de facto evidence of cheating and could result in a charge of academic dishonesty (see student code of conduct) <http://www.shsu.edu/students/guide/StudentGuidelines2010-2012.pdf#page=29>).

**TOBACCO POLICY:** In order to promote a healthy, safe, and aesthetically pleasing work, educational, and living environment, Sam Houston State University (SHSU) will endorse a smoke free and tobacco free environment. Tobacco products include cigarettes, cigars, pipes, smokeless tobacco, and all other tobacco products. This policy applies to all faculty, staff, students, employees of contractors, and visitors of Sam Houston State University on the premises of the university.

**VISITORS IN THE CLASSROOM:** Unannounced visitors to class must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. If the visitor is not a registered student, it is at the instructor's discretion whether or not the visitor will be allowed to remain in classroom.

**AMERICANS WITH DISABILITIES ACT:** It is the policy of Same Houston State University that no otherwise qualified disabled individual shall, solely by reason of his/her handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any academic or Student Life program or activity. Disabled students may request assistance with academically related problems stemming from individual disabilities by contacting the Director of Counseling Center in the Lee Drain Annex or by calling (936) 294-1720. If you have a disability that may adversely affect your work in this class, then I encourage you to register with the Counseling Center and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential.

**NOTE:** no accommodation can be made until you register with the Counseling Center.

**STUDENT ABSENCES ON RELIGIOUS HOLY DAYS POLICY:** Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence. University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). This request must be made in the first fifteen days of the semester or the first seven days of a summer session in which the absence(s) will occur. The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed.

**INSTRUCTOR EVALUATIONS:** You will be asked to complete a course/instructor evaluation form toward the end of the semester.