COURSE OUTLINE
Fire Equipment and Systems

Course Description
FS 201. Fire Equipment and Systems. 3 hours credit. Prerequisite: FS 100 with a C or better or concurrent enrollment in FS 100. This course will enable the student to become familiar with the components of modern fire apparatus such as pumpers, aerial apparatus, tankers, etc. The student will analyze various systems, including electrical, braking, drive train, chassis frame, and hydraulics, and develop the skills needed to write specifications for the purchase of new fire apparatus and equipment.

Required Materials
For complete material(s) information, refer to https://bookstore.butlercc.edu

Butler-assessed Outcomes
The intention is for the student to be able to:
1. Display a working knowledge of fire equipment and systems in use by today’s fire service.
2. Complete bid specifications for the purchase of a fire apparatus.

Learning PACT Skills that will be developed and documented in this course
Through involvement in this course, the student will develop ability in the following PACT skill area(s):

Analytical Thinking Skills
- Critical thinking - Through identifying and defining different types of fire apparatus and their systems, the student will develop critical thinking skills.
- Problem solving - Through identifying compatibility problems with different apparatus components, the student will develop problem-solving skills.

Major Summative Assessment Task(s)
These Butler-assessed Learning Outcome(s) and the Learning PACT skills will be demonstrated by:
1. Generating an equipment bid specification using researched data on various fire apparatus designs, features, and operating systems and determining their correlation.

Skills or Competencies
Actions that are essential to achieve the course outcomes:
1. Identify fire apparatus components and systems
2. Explain the fire apparatus bid and specification process

Learning Units
I. The engine
   A. Gasoline engines
B. Diesel engines  
C. Engine construction  
D. Engine performance standards  

II. Engine systems  
A. Fuel systems  
B. Ignition systems  
C. Lubrication systems  
D. Cooling systems  
E. Electrical systems  

III. The chassis and component parts  
A. Chassis  
B. Power train  
C. Braking systems  
D. Steering  

IV. Engine and systems troubleshooting  
A. Diesel engines  
B. Carburetion maintenance  
C. Carburetor problems  
D. Clutches  
E. Drive train  
F. Manual steering  
G. Hydraulic power steering  
H. Air brakes  
I. Automatic transmissions  

V. Apparatus testing  
A. Pumper testing  
B. Aerial ladder and elevating platform testing  
C. Safety testing and evaluation  

VI. Driving procedures  
A. Driver characteristics  
B. Driving techniques  
C. Driving conditions  
D. Emergency response  

VII. Fire pumps  
A. Theory of positive displacement pumps  
B. Types of positive displacement pumps  
C. Centrifugal pumps  
D. Main pumps  

VIII. Pump accessories
A. Pump operator’s panel
B. Priming devices
C. Pressure control devices
D. Pumping devices
E. Monitoring devices
F. Automation

IX. Pumper operations
A. Tank operations
B. Hydrant operations
C. Drafting operations
D. Relay operations
E. Pumping techniques
F. Supplying master streams

X. Aerial ladder operations
A. Types of aerial ladder apparatus
B. Duties and responsibilities of an aerial ladder operator
C. Aerial ladder construction
D. Operating controls and systems
E. Operational procedures

XI. Elevated platforms
A. Types of elevated platforms
B. Elevated platform features
C. Mack Aerialscope

**Learning Activities**
Learning activities will be assigned to assist the student to achieve the intended learning outcomes through lecture, discussion, hands-on exercises, and other activities at the discretion of the instructor.

**Grade Determination**
The student will be graded on completion of assessment tasks, learning activities, written examinations, and a semester project.