COURSE SYLLABUS
DFTG 2317 – Descriptive Geometry
Course ID: 37832 – spring 2013
Stafford Campus – Room E100 | 6:00 - 10:00 pm | Thurs
4 hours of Lecture/Lab per week for 16 weeks

Instructor: Curtis M. Davis
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COURSE DESCRIPTION:
Descriptive Geometry is the branch of geometry concerned with the two-dimensional representation of three-dimensional objects. In other words, it is the graphical solution to three-dimensional spatial problems. Modern mechanical drawing and architectural drawing are based on the principles of Descriptive Geometry. This course is an examination of methods to develop graphical solutions to problems involving points, lines, and planes in space.

PREREQUISITE:
DFTG 1305 Technical Drafting
DFTG 1309 Basic computer aided Drafting or Department Approval

REQUIRED TEXT:
All students will be required to purchase the text book:
Applied Descriptive Geometry – Second Edition
Author: Kathryn Holliday-Darr
Publisher: Delmar

REQUIRED MATERIALS:
Scales – Metric, Engineering, and Architectural (triangular)
Set of drawing instruments (minimum set)
Protractor (180 degrees)
30/60 Triangle
45/90 Triangle
Note book
COURSE GOALS:
The fundamental concepts of Descriptive Geometry will be explored through an emphasis on logical reasoning, visualization, and practical applications. Students are to learn the tools and techniques of descriptive geometry for solving problems related to translating 3D objects into 2D graphical descriptions.

LEARNING OUTCOMES:
The student shall demonstrate an understanding of geometric construction, various view selections, competency in drafting principles in plane geometry, technical sketching, orthographic projection theory and practice, auxiliary views, and competency in sectioning, dimensioning, and tolerance. The student will also develop an understanding of the application of these techniques to solving practical problems in design, engineering, manufacturing and construction.

COURSE OBJECTIVES:
Demonstrate the ability to visualize 3D objects in their 2D planar geometric shapes; develop sequential thinking; methods of analysis; and spatial problem solving.

1. KNOWLEDGE:
The student will understand how to;
   a. Find the point view of a line,
   b. Determine the true length view of a line,
   c. Determine the edge view of a plane,
   d. Determine the true shape view of a plane,
   e. Measure the angle between an oblique line and a plane and between two planes, and
   f. Determine the slope, bearing, grade, strike, and dip in typical civil engineering, oil field exploration and mining application problems.

2. SKILLS:
The student will gain the ability to;
   a. Determine the piercing points and intersections between lines and planes,
   b. Construct developments of geometric shapes, and
   c. Solve typical engineering spatial problems.

3. ATTITUDES/BEHAVIORS:
The student will;
   a. Learn to follow instructions as presented in the classroom,
   b. Demonstrate patience and discipline,
   c. Show respect for others,
   d. Work as a team member,
   e. Comprehend written and verbal directions,
   f. Follow specifications, and
   g. Meet deadlines.
COURSE CURRICULUM STATEMENT:
The student will be presented techniques that can be applied to orienting ones point of view with objects in space in order to determine specific data from geometry. These techniques, based on the involved relationships will be applied to attain both visual and mathematical solutions to problems of describing 3D objects in 2D graphic solutions. The student’s understanding of these techniques of acquiring geometric data to solve problems will be evaluated through the assignments involved in this course.

GRADING:
Exams and assignments will be given during the semester that will determine how successful you are at mastering the course material and basic skills. If you are having limited success at mastering the course material, contact the instructor for assistance.

Grading Percentage
- Drawing Assignments 40% of the final grade
- Quizzes & Reading Assignments 10% of the final grade
- Mid-term exam 20% of the final grade
- Final exam 20% of the final grade
- Attendance 10% of the final grade

The instructor will schedule tests and/or quizzes at his discretion. Lecture/laboratory attendance, active participation in class, professional attitude, growth in the development of the student’s technical skills and teamwork within the laboratory environment will also be taken into consideration in evaluating student performance. Numerical grades for each assignment, quiz and test, in addition to the aforementioned performance criteria, will be combined at the instructor’s discretion to determine the student’s final grade.

Numerical grades earned by the student on each assignment, quiz or test will be recorded by the instructor with a corresponding letter grade based on the grading scale below.

Grading Scale
- 90-100 = A
- 80-89 = B
- 70-79 = C
- 60-69 = D
- Below 59 = F

STUDENT ASSIGNMENTS:
Drawing assignments are taken from various chapters of the required text book related to each topic so as to enhance the learning of the basic skills of proper drafting techniques. Drawing assignments may also be given from other sources. Each assignment will stress the basic skills that a student must have to gain proficiency in the development of 2D illustrations of 3D objects. The assignment will enhance the student’s ability to produce a clear and accurate drawing.
INSTRUCTIONAL METHODS:
Descriptive Geometry DTFG 2317 is a course designed to present a specific approach to drafting that accurately illustrates 3D objects in true 2D dimensioned surfaces of mechanical and product parts.

Lectures and presentations cover most chapters and demonstrate the techniques of certain concepts. Exercises and problem solving will provide the student an opportunity to master many current drawing and drafting techniques.

In order to become proficient in the knowledge and use of these drafting skills, a student must read the text book, complete the exercises in a timely manner and regularly attend class.

Note: AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANCE
Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc) who needs to arrange reasonable accommodations must contact the Disability Support Services Office (DSSO) of their respective college at the beginning of each semester. Faculty is authorized to provide only the accommodation(s) requested by the DSSO. For information and services at HCC Southwest, contact: DR. Becky Hauri, ADA Counselor, at 713.718.7910.

CLASS ATTENDANCE:
You are expected to attend all lecture/labs. You are also responsible for all materials covered in either lecture or lab. In the case of your absence, you must contact the instructor to obtain make-up assignments or arrange make-up testing, either of which may be distributed at the instructor’s discretion. Class attendance is checked daily. The instructor has the authority to drop you from the class for excessive absences, that is, you may be dropped from a course after accumulating absences in excess of 12.5 percent of the total hours of instruction (lecture and lab).

For Example:
A 3-credit hour lecture class meeting 3 hours per week - 2 absences (6 hrs.) is 12.5% of the class.
A 3-credit hour lecture/lab class meeting six hours per week - 2 absences (12 hrs.) is 12.5% of the class. Administrative drops are at the discretion of the instructor. It is your responsibility to drop a course, should you choose not to complete it. Failure to withdraw officially will result in you receiving a grade of “F” in the course.

Note: Although it is your responsibility to officially withdraw from a course, it is always a good idea to discuss any attendance problems with your instructor first. Class attendance is very important, but your instructor may be able to help you catch up. If you become ill or know you are going to miss class for some reason, tell your instructor as soon as possible.

Departments and programs governed by accreditation or certification standards may have different attendance policies.
**SCHOLASTIC DISHONESTY:**
Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. College System Officials may initiate penalties and/or disciplinary proceedings against a student accused of scholastic dishonesty. "Scholastic dishonesty" includes, but is not limited to, cheating on a test, plagiarism, and collusion.

"Cheating" on a test includes:
- Copying from another student's test paper;
- Using materials during a test that are not authorized by the person giving the test;
- Collaborating with another student during a test without authorization from the instructor;
- Knowingly using, buying, selling, stealing, transporting, or soliciting in whole or part the contents of an un-administered test;
- Bribing another person to obtain a test that is to be administered.

"Plagiarism" means the misuse of another's work and the deliberate incorporation of that work into work you offer for credit. "Collusion" means the unauthorized collaboration with another person in preparing work offered for credit.

Determination of scholastic dishonesty will be at the discretion of the instructor. Reference the following web link for additional information: [http://www.hccs.cc.tx.us/handbookiStudentP.htm](http://www.hccs.cc.tx.us/handbookiStudentP.htm)

(SYLLABUS CONTINUED ON NEXT PAGE)
COURSE CONTENTS:
(Based on Applied Descriptive Geometry, by Kathryn Holliday, 2nd Edition)

The course material is divided into units. The objectives, order of presentation and source of reference for each unit shall be as follows:

1. Introduction to Drafting
   At the end of this unit the student will be able to:
   a. Describe the role of drawings in the design process.
   b. Understand the role of the draftsman in the process of design, the fabrication of objects, the assembly of fabricated objects, the manufacturing process of objects, the built environment and mining/extraction processes.
   c. Understand the design process.

2. Drafting Instruments
   At the end of this unit the student will be able to:
   a. Identify drafting equipment and describe its usage.
   b. Describe the types and standard sizes of drafting paper.
   c. Use the different drafting scales to create a simple drawing.
   d. Identify and draw the alphabet of lines.
   e. Draw horizontal, vertical and inclined lines in a prescribed manner.

3. The Various Types of Scale and How to Read and Use Them (Textbook: Chapter 1, pp. 1-8)
   At the end of this unit the student will be able to:
   a. Understand the Architectural scale and how to read and use it.
   b. Understand the Engineering scale and how to read and use it.
   c. Understand the Metric scale and how to read and use it.

4. Introduction to Descriptive Geometry (Textbook: Chapter 1, pp. 8-15)
   At the end of this unit the student will be able to:
   a. Understanding the basic terms of descriptive geometry.
   b. Begin to understand the concepts associated with descriptive geometry.
   c. Begin drawing orthographic projections.

5. Points and Lines in Space (Textbook: Chapter 2)
   At the end of this unit the student will be able to:
   a. Locate a point or a line in a view, given location information in two other views.
   b. Explain foreshortening.
   c. Describe how you will know if a line is in true length.
   d. Name three principal line types, and explain the differences between them.
   e. Describe the precise location of a line in space, in relationship to the principal projection planes.
6. Lines and Their Characteristics (Textbook: Chapters 4 & 5)
At the end of this unit the student will be able to:
   a. Identify the type of a line.
   b. Locate the true length of a line.
   c. Locate the point view of a line.
   d. Define and locate the bearing and slope of a line.
   e. Determine if a point is on a line.
   f. Determine if lines are intersecting or nonintersecting.
   g. Determine if lines are perpendicular or not.
   h. Construct a view that will show the clearance between two parallel lines.
   i. Find the shortest distance from a given point to a line.
   j. Find the shortest distance from two skewed lines.

7. Planes and Their Relationships (Textbook: Chapters 6 & 7)
At the end of this unit the student will be able to:
   a. Explain what a plane surface is.
   b. Describe four different methods by which a plane may be formed.
   c. Explain the difference between normal and oblique planes.
   d. Explain how to determine the type of plane.
   e. Demonstrate how to find the edge view of a plane surface.
   f. Define and demonstrate how to find the bearing (strike) of a plane.
   g. Define and demonstrate how to find the slope (dip) of a plane.
   h. Define and demonstrate how to find the dip direction of a plane.
   i. Explain and demonstrate how to find the true shape of a plane.
   j. Determine the shortest horizontal, perpendicular, or grade line from a point to a plane.
   k. Explain why all shortest lines from a given point to a plane have the same bearing.
   l. Explain why all shortest lines from a given point to a plane appear true length in the view that shows the plane as an edge.
   m. Determine the angle between a line and a plane.
   n. Determine the angle between two intersecting planes.
   o. Determine the shortest horizontal, perpendicular, or grade line between two lines, using the plane method.

8. Auxiliary Views (Textbook: Chapter 3)
At the end of this unit the student should be able to:
   a. Describe an auxiliary view.
   b. Explain the difference between primary and secondary auxiliary views.
   c. List the four fundamental views.
   d. Locate top-adjacent, front-adjacent, and side-adjacent auxiliary views using primary views.
   e. Locate principal views of an object using auxiliary views.
9. Piercing Points and the Intersection of Planes (Textbook: Chapter 8)
At the end of this unit the student will be able to:
   a. Determine the piercing point of a line with a plane using the edge view method and the cutting plane method.
   b. Determine the line of intersection between two nonparallel planes using the edge view method and the cutting view method.
   c. Determine the intersection of a three-dimensional object and an oblique plane.
   d. Determine the intersection of two solids.
   e. Determine the correct visibility.

10. Revolution (Textbook: Chapter 9)
At the end of this unit the student will be able to:
   a. Explain the primary difference between the change of position methods (auxiliary view methods) and the revolution method of solving descriptive geometry problems.
   b. Describe the four fundamental principles of revolution.
   c. Determine the true length and true slope of a line using the revolution method.
   d. Determine the true shape of a plane using the revolution method.
   e. Determine the true angle between a line and a plane and between two intersecting planes using the revolution method.

11. Development (Textbook: Chapter 10)
At the end of this unit the student should be able to:
   a. Define the term development and explain how developments are used in actual practice.
   b. Explain the difference between the three general types of developments.
   c. Examine a given object and determine which type of development is appropriate.
   d. Accurately construct the necessary development.

12. Mining and Civil Engineering Applications (Textbook: Chapter 11)
At the end of this unit the student should be able to:
   a. Determine the strike, dip, dip direction, and thickness of a stratum of ore.
   b. Determine the probable outcrop of a stratum.
   c. Determine the cuts and fills along a level road and along a road at a specified grade.

At the instructor’s discretion, additional material from sources other than the required text on Descriptive Geometry may be presented as a supplement to and/or substitution for the course contents listed above. The order of presentation of the course contents may also be changed at the instructor’s discretion.