I. INTRODUCTION

A computer-aided modeling course studying the development of three-dimensional drawings and models from engineering sketches and orthographic drawings and utilization of three-dimensional models in design work.

II. LEARNING OUTCOMES

Upon successful completion of this course, Solid Modeling/Design, the student will:

A. Define and maintain user-defined coordinate systems to aid in the construction of 3D objects.

B. Create and use paper space layouts and model space viewports.

C. Extract two-dimensional views from a three-dimensional model for detail drafting.

D. Identify the various types of surface meshes and applications for each.

E. Create 3D surface models using a variety of techniques.

F. Select and use various 3D display options.

G. Generate 3D text and dimensions.

H. Create and edit simple 2D regions and 3D solid models.

I. Render a 3D model with a variety of lights, shading, materials, landscaping, and backgrounds.

III. INSTRUCTIONAL MATERIALS

A. The instructional materials identified for this course are viewable through www.ctcd.edu/books

B. Notebook

C. Flash drive recommend at least a 512MB
IV. COURSE REQUIREMENTS:

A. Students are encouraged to work quickly and efficiently. Their grades will depend upon their speed and skill as well as their knowledge of drafting techniques. Students should remember that requirements for a passing grade includes keeping up-to-date on all assignments. (See section VI for assignment grading)

B. All outside reading assignments must be read before discussion dates. Textbook, notebook and disk should be brought to each class meeting.

V. EXAMINATIONS

A. Examinations will generally consist of a combination of objective questions and drawing problems. The drawing portions shall be graded for accuracy, neatness, and speed.

B. Unannounced short quizzes shall be given at the discretion of the instructor. There are no make-up for unannounced quizzes. Students with an excused absence shall review the grading computation with the instructor.

C. Make-up examinations shall be given only to those students having an excused college absence. Excusable absences are those resulting from personal illness, emergencies arising within the family, official school sponsored trips, and military duties or orders requiring brief absences. The student must notify the instructor prior to the absence.

D. At the option of the instructor, any missed exams shall be: made-up at a time convenient to the instructor; or the following exam shall count additionally for the missed exam.

E. At no time shall a student use a cell phone or other personal communication or music device during a test, quiz, or any other evaluation type process. Any of these devices should be turned off during the time of the test or quiz and should not be accessed until the student has completed the evaluation and has left the classroom. Violation of this policy shall result in the student receiving a failing grade for the course.
VI. SEMESTER GRADE COMPUTATION

Ninety-five percent of the semester grade will be derived from the average score of the unit quizzes combined equally with the averaged score of the drawing assignments. The remaining 5% of the semester grade shall be based on attendance/participation.

Attendance = 5 points minus 1 point for each unexcused absence

Quiz Average = \[ \frac{\text{Total Score of Quizzes}}{\text{Numbers of Quizzes}} \]

Drawing Average = \[ \frac{\text{Total Score of Assignments}}{\text{Number of Assignments}} \]

Semester Average = \( \frac{(\text{Quiz Average} + \text{Drawing Average}) \times 0.95 + \text{Attendance}}{2} \)

Students are advised to keep an accurate record of their respective assignments and quiz scores. With this record and by using the formulas provided, grade averages can be calculated at any time during the semester.

The drawing problems assigned will be graded on five major points: Speed, View placement, Accuracy, Line Type, and Text. In most cases, a number grade will be assigned to the drawing based on the numbers one to ten (one being the lowest and ten the highest).

Unless otherwise instructed, all assignments shall be the individual work of the student. Although collaboration and assistance by other students is encouraged, the creation and production of the work must be that of the individual student. The electronic (or otherwise) sharing of assignments is to be considered collusion and shall result in disciplinary action.

All assignments are due per the course outline. Assignments are due at the beginning of class. Late assignments may be accepted at the instructor’s option. Late assignments will be penalized 1 point for every 24 hours the assignment is late.

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM THE INSTRUCTOR

ATTENDANCE POLICY

Tardiness

Students are required to be in classrooms on time. Instructors may choose to lower a student's grade because of tardiness. Each three unexcused tardies shall result in one
absence. Excessive tardiness, since it is disruptive to the educational process, may result in disciplinary action. Due process and the right to appeal will be provided to students subjected to disciplinary action. Details can be found in the Student Handbook, which is available at the Office of Student Services.

**Class Attendance**

Because absences for any reason negatively affect the learning process, the individual student, and the class, students are expected to attend all classes in which they are enrolled. Responsibility for class attendance rests with the student. Regular and punctual attendance at all scheduled classes is expected, and the College reserves the right to deal at any time with individual cases of nonattendance.

A. The effect of absences on grades is determined by the instructor.

B. Excessive absences constitute cause for dropping a student from class; in such a case the grade of FN may be given.

C. In extreme cases the academic dean may suspend the student from the College.

D. When absence from class is necessary for any reason, the student has the responsibility to arrange to make up assignments missed during the absence.

E. The decision to allow a student to make up work following any absence rests solely with the instructor.

F. The student who desires to be absent from classes for the observance of a religious holy day should submit a request to each instructor by the 15th calendar day after the first day of the semester. Although the student will be excused from classes, he/she will be responsible for make-up of all work or tests missed. A "religious holy day" means a holy day observed by a religion whose place of worship is exempt from property taxation under Section 11.20, Tax Code.

**Excessive Absences**

Absences from classes for any reason must not exceed College standards. Because objectives can vary from department to department and from course to course, the instructor shall inform the student of specific course objectives at the initial class meeting. A student who is not meeting course objectives may be withdrawn from the course at the discretion of the instructor.
A. Students who have not attended class by the 12th class day will be dropped by the instructor with a grade of "W".

B. Students may be administratively withdrawn from any class when their absences exceed a total of five (5) class meetings for long semester, three (3) class meetings for eight-week semester, two (2) class meetings for six-week semester, and in the opinion of the instructor they cannot satisfactorily complete the course. The final decision rests solely with the instructor.

The following specific rules apply to absences:

A. Instructors are required to keep attendance records.

B. Each faculty member will inform students of the attendance policy of the course at the initial class meeting.

C. Students are responsible for understanding the attendance policy for each course in which they enrolled and for meeting the attendance requirements.

D. Failure to meet the attendance requirements in a course may lower a grade for the semester or may result in failure in the course.

E. An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on the Administrative Withdrawal Form for submission to the registrar.

F. Only instructors can authorize an absence. Regardless of the reason for the absence, students are responsible for completing all course work covered during any absence.

Official Withdrawal Policy

It is the student's responsibility to officially drop a class if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file an Application for Withdrawal or an Application for Refund at the Records Office, or with a Central Texas College representative at the Military Education Center.

A. The withdrawal form must be signed by the student.

B. Application for Withdrawal will be accepted at any time prior to the 12th
week of classes. Students attending the Fort Hood eight-week classes may withdraw at any time before the Wednesday prior to the first day of finals. Also see Grade Notes: "W", page 29. The date is published each semester in the Schedule Bulletin.

C. Students using Financial Aid, Military Tuition Assistance, VA benefits or other than personal funds may be required to repay tuition and fees to the funding agency. For specific repayment requirements, students are referred to the Student Financial Aid Office, or the Veterans Services Office. Military Tuition Assistance students are referred to the Military Education Center. Students must withdraw in person after receiving FA, MTA, or VA approval.

D. Student may not withdraw from a class for which the instructor has previously issued the student a grade of "F" or "FN" for nonattendance.

Disability Support Services

Disability Support Services provides services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Review the website at www.ctcd.edu/disability-support for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

VIII. COURSE OUTLINE

A course outline and assignment sheet will be provided to each student as a supplement to this syllabus, prepared so as to reflect the most current date and drawing assignments for the course. The outline divides the course into several units of studies, with information grouped according to the title of the respective unit.

Student activities through each unit will be essentially the same. Reading assignments are to be prepared prior to the scheduled class in order to better facilitate discussions and enhance understanding.

A. Lesson One: Introduction to 3D drawings

1. Learning Outcomes: Upon successful completion of this lesson, the student will:

   a: Design using rectangular 3D coordinates, creating 3D extruded shapes, understanding and using the VPOINT, constructing wireframe and 3D faces, and 3D drawings using
the elevation, line and 3D face methods.

B. **Lesson Two:** 3D Coordinates and construction

1. **Learning Outcomes:** Upon successful completion of this unit the student will be able to:

   a: 3D drawing using the rectangular, spherical, and cylindrical coordinate system, using the User Coordinate System, use and manipulation of the 3D surfaces and pull-down object menu including 3D arraying and 3D polyline.

C. **Lesson Three:** Understand the User Coordinate System (USC)

1. **Learning Outcomes:** Upon successful completion of this unit the student will be able to:

   a: Use, manipulation, and aligning of the User Coordinate System, selecting new origin, rotation and multiple UCS icons.

D. **Lesson Four:** Using Model Space Viewports

1. **Learning Outcomes:** Upon successful completion of this unit the student will be able to:

   a: Understanding, using, and set-up of Tiled Viewports, VPORTS, TILEMODE, and MVIEW.

E. **Lesson Five:** Three Dimensional Surface Modeling Techniques

1. **Learning Outcomes:** Upon successful completion of this unit the student will be able to:

   a: Surface modeling of objects using the various surface commands, mesh functions, and modification of surfaces.

F. **Lesson Six:** Editing Three-Dimensional Objects

1. **Learning Outcomes:** Upon successful completion of this unit the student will be able to:

   a: Change properties using multiple editing functions. This design phase also includes rectangular and polar 3D
arraying.

G. **Lesson Seven**: Viewing and Displaying Three-Dimensional Models

1. **Learning Outcomes**: Upon successful completion of this unit the student will be able to:

   a: Study of onscreen manipulation of objects with the Camera, Target, Distance, Points, Pan, Zoom, and Clip.

H. **Lesson Eight**: Three-Dimensional Text and Dimensioning

1. **Learning Outcomes**: Upon successful completion of this unit the student will be able to:

   a: Creating 3D text, thickness manipulation and changing the text with the UCS. Placing leaders and radial dimensions in 3D and creating templates.

I. **Lesson Nine**: Introduction to Shading and Rendering

1. **Learning Outcomes**: Upon successful completion of this unit the student will be able to:

   a: Introduction of 3D model shading and rendering 3D model rendering.

J. **Lesson Ten**: Introduction to Solid Modeling

1. **Lesson Outcome**: Upon successful completion of this unit the student will be able to:

   a: Construction of regions, solid primitives, unions, deletions, and interfacing of volumes from the intersection of two solids.