I. INTRODUCTION

Technical Drafting is a course designed to introduce to the student the principles of drafting to include terminology and fundamentals, including size and shape descriptions, projection methods, geometric construction, sections, auxiliary views, and reproduction processes.

Technical Drafting is considered to be an integral and important part of a drafter's education. It is the language that is used universally to describe the size and shape of structures and mechanisms. Familiarization with this language is needed to increase the effectiveness of graphic communication between design and production people.

II. OVERALL OR GENERAL OBJECTIVES OF THE COURSE

Upon successful completion of this course, Technical Drafting, the student will be able to:

A. Identify and use all instruments of the basic drafting kit. (See III, Materials and Equipment).

B. Freehand letter a drawing according to drafting lettering standards.

C. Use graphic geometry to construct geometric shapes.

D. Make use of spatial relationship to identify and project points, lines, and planes.

E. Project two or more views of an object using the orthographic third angle method of projection.

F. Project horizontal, frontal, and profile auxiliary views to establish the true size of incline and Oblique surfaces.

G. Construct sectional views of a part to best expose an interior portion or part.

H. Use basic dimensioning to completely describe the shape, size and feature location of a part.

I. Graphically represent screw threads and fasteners to drafting standards.
III. INSTRUCTIONAL MATERIALS

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

2) References:
   a) Dobrovolny and O’Bryant, Graphics For Engineers, Drawing, New Jersey, Prentice Hall, Inc.

C. Equipment and Materials

The following items must be obtained by the student before any drawing assignments may be attempted. These items need not be expensive but should be of professional quality. When any questions arise pertaining to the selection of equipment, the student should seek the advice from the instructor, an experienced drafter, or a reliable dealer.

1. Three lead holders a 0.3, 0.5, and 0.7 mm
2. Leads for the above holders
   i. 0.3mm – 1 pk. 2H
   ii. 0.5mm – 1 pk. 2H
   iii. 0.7mm – 1 pk. H
3. 1 2mm lead holder with 4H lead
4. 1 drafting dots
5. 1 White Plastic Eraser
6. 1 Individual instrument set (center wheel bow compass and universal adapter)
7. 1 Irregular curve
8. 1 Erasing shield
9. 1 Desk brush
10. 1 Sandpaper pad
11. 6° - 180° protractor
12. 1 Triangular Civil Engineer’s Scale
13. 1 Triangular Architect’s Scale
14. 1 Triangular Metric Scale
15. 1 Ames lettering guide
16. 1 45° Triangular (6” sides)
17. 1 30° x 60° triangle (6” long side)
18. 1 Circle template
19. Comp Book w/graphic lines (5x5 quad) 43.475
IV. COURSE REQUIREMENTS

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)

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

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

Grades shall be computed on a total point basis as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drawing Assignments</td>
<td>350</td>
</tr>
<tr>
<td>Tests</td>
<td>300</td>
</tr>
<tr>
<td>Attendance</td>
<td>50</td>
</tr>
</tbody>
</table>
Total points possible: 700 points

The point breakdown for grades shall be as follows:

A = 630 to 700 points  
B = 560 to 629 points  
C = 490 to 559 points  
D = 420 to 489 points  
F = 419 points or less

Students are advised to keep an accurate record of their assignments and test scores. By keeping track of the total points the student can calculate their grades as a percentage of their possible points at any time.

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 a one to ten range in .5 increments (one being the lowest and ten the highest).

Attendance points shall be deducted at a rate of 10 points per each unexcused absence after the first absence (excused or unexcused).

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 COURSE INSTRUCTOR

ATTENDANCE POLICY

Tardiness

For Face-to-face and blended courses, students are required to be in classrooms on time. Instructors may choose to lower a student's grade because of tardiness. Each three tardies may 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. When absence from class is necessary for any reason, the student has the responsibility to arrange to make up assignments missed during the absence.

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

D. 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 may be reflected in the student's performance in the course. The specific course objectives will be reviewed at the initial class meeting and may be different for different courses in the college or even within a department or program. The following shall apply to this course:

A. Students who have not attended class by the 12th class day will be dropped from the course by the instructor or the college.

B. Students who chose to withdraw from a course after the 12th day of class should do so before the deadline to withdraw. An instructor will be unable to drop any student from a course after the 12th day of class.

C. Any financial impacts of withdrawing from a course rests solely with the student. The student should check with the appropriate financial office or program to determine the impact of withdrawing from a course prior to withdrawing from any course.
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; impact the student's performance in the course; may lower the grade for the semester; or may result in failure in the course.

E. Only the instructor can authorize an absence. Regardless of the reason for the absence, students are responsible for completing all course work covered during any absence. The decision to allow a student to make up work following any absence rests solely with the instructor.

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.

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

B. Application for Withdrawal will be accepted at any time prior to the deadline listed in the schedule bulletin for the semester.

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.

D. Other requirements may be required for course withdrawal. Refer to the Semester Schedule Bulletin, the College Catalogue, and the Student Handbook.
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.

Civility

Individuals are expected to be cognizant of what a constructive educational experience is and be mindful of that at all times. The learning environment should be treated as a workplace simulation and should be approached with respect and in a respectful manner to others participating in this environment. Proper etiquette and respect for others should always be displayed. Failure to do so can result in disciplinary action up to and including expulsion.

Office Hours

The instructor maintains regular posted office hours and should be available during these times but prior appointments and other students and/or meetings may limit availability during these posted times. Students are advised to make an appointment with the instructor or office staff to ensure meeting time and availability.

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 state-of-the-art drafting assignments for the respective semester. As will be seen below, that outline divides the course into five 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 greater enhance understanding.

I. Unit One: Drafting Equipment Identification and Use

A. Unit Objectives: Upon successful completion of this unit, the student will be able to:
   1. Identify by sight the instruments used for drafting
2. Demonstrate the proper use and care of this equipment
3. Check the alignment of the drafting machine
4. Select the proper media on which to make different types of drawings
5. Select the proper grades of pencils or pencil leads used in drawings
6. Sharpen pencils or leads of lead holders correctly
7. Align drafting machine to paper
8. Hold pencil or lead holder correctly to provide good line quality
9. Use the drafting machine to draw horizontal lines
10. Use the drafting machine to draw vertical and angular lines
11. Sharpen and adjust compass lead
12. Draw circles and arcs using the compass
13. Identify and draw the lines or the alphabet or lines
14. Demonstrate the use of the architectural, civil, and metric scales by scaling line segments and by drawing line segments to a given scale

II. Unit Two: Geometric Construction

A. Unit Objectives: Upon successful completion of this unit, the student will be able to:
   1. Bisect, trisect, and divide a line into any even or odd number of segments
   2. Bisect an angle
   3. Construct regular polygons by circumscribing and inscribing a circle
   4. Draw circles tangent to lines and lines tangent to circles
   5. Draw a circle through a given point and tangent to a given line
   6. Draw arcs tangent to a right, acute and obtuse angle
   7. Draw arcs tangent to two circles or arcs
   8. Draw two lines tangent to two circles (open belt & cross belt)
   9. Draw an arc tangent to a circle or arc and to a straight line

III. Unit Three: Lettering

A. Unit Objectives: Upon successful completion of this unit, the student will be able to:
   1. Use a Lettering Guide to draw guide lines for lettering
   2. Select the correct grade of pencil or lead for lettering
   3. Letter the alphabet, capital and lower-case, whole numbers and common fractions using the single-stroke gothic vertical style of lettering
   4. Letter the alphabet, capital and lower-case, whole numbers and common fractions using the single-stroke gothic inclined style of lettering
   5. Use either of the above styles of lettering to completely detail a drawing
IV. Unit Four: Multi-view Projections and Spatial Relationship

A. Unit Objectives: Upon successful completion of this unit, the student will be able to:

1. Identify the principal planes of projection
2. Define the spatial dimensions of height, width and depth
3. Identify the planes that makeup an object i.e. horizontal, frontal, profile, incline and oblique planes
4. When given two views of an object, construct the third view by projection
5. When given two views of an object, construct more than one possible solution for the third view by projection
6. When given a dimensioned isometric view of an object, construct two orthographic views of that object.
7. When given an isometric view of an object, construct the six orthographic views of that object
8. When given two incomplete views of an object, construct the third view and complete the two given views
9. When given two views of a curve on an incline plane, complete the third view by plotting the curve

V. Unit Five: Auxiliary View Projection

A. Unit Objectives: Upon successful completion of this unit, the student will be able to:

1. Define the purpose of auxiliary views
2. Draw a true size view of an incline plane by projecting from the frontal, profile or horizontal planes of projection
3. Project the true size view of a truncated cylinder or irregular curve by plotting points
4. Use reverse auxiliary construction to complete regular views of an object
5. Project primary and secondary views of an oblique plane to establish true size

VI. Unit Six: Sectional Views and Conventions

A. Unit Objectives: Successful completion of this unit, the student will be able to:

1. Explain the purpose of a sectional view of an object
2. Define a cutting plane line
3. Draw the two accepted types of cutting plane lines
4. Draw the following types of sections of an object and use section lining (cross-hatching) to identify the sectioned area: full, half, offset (full and half), broken out, removed, revolved, aligned reverse and auxiliary
5. Use conventional or preferred practices when sectioning objects that contain ribs, webs, spokes, lugs, intersections, etc.

VII. Unit Seven: Basic Dimensioning

A. Unit Objectives: Upon successful completion of this unit, the student will be able to:
   1. Demonstrate the technique of dimensioning by drawing the correct character of lines i.e. extension, dimension and leaders the spacing of dimensions, the making of arrowheads, etc.
   2. Define the difference between size and location dimensions
   3. Define the difference between the unidirectional and aligned system of dimensioning
   4. Place dimensions and extension lines according to standards
   5. Dimension the following basic geometric shapes: prism, cylinder, pyramid, cone and sphere
   6. Dimension fillets, rounds and arch
   7. Dimension angles
   8. Dimension machine holes i.e. countersink, counterbore, spotface, drilled and tapped
   9. When given two or more orthographically projected views of an object composed of normal, incline, and oblique planes positive and negative geometric shapes, completely dimension the object using the aligned or coordinate method of dimensioning

VIII. Unit Eight: Screw Threads and Fasteners

A. Unit Objectives: Upon successful completion of this unit, the student will be able to:
   1. Define the three basic applications of a screw thread
   2. Identify and define the parts of a screw thread
   3. Identify and draw the standard thread forms
   4. Draw external and internal threads using thread symbols:
   5. Define the parts of a thread note
   6. Use the ANSI screw thread note
   7. Identify and draw standard screws, bolts and nuts