NEW RIVER COMMUNITY COLLEGE
DUBLIN, VIRGINIA

COURSE PLAN

Course Number and Title: CAD 114 - Drafting I

Prepared By: CAD Faculty Member Fall, 2014
(Instructors) (Date)

Approved By: Fall, 2014
(Dean) (Date)

I. Course Description

(3 credits) CAD 114 introduces technical drafting from the fundamentals through advanced
drafting practices. This course teaches geometric construction, orthographic projection,
sections and conventions, pictorial drawings, isometric principals, oblique drawing, and
dimensioning. Lecture 1 hour. Laboratory 6 hours. Total 7 hours per week.

II. Introduction

Students will have basic working knowledge and proficiency of the following areas and
listings upon the end of CAD-114

III. Learning Outcomes

Upon successful completion of this course, the student will be able to show entry level
proficiency in:
- Mechanical Drafting Standards as pertaining to ADDA National Certification
- CAD Drafting with AutoCAD 2014

IV. Instructional Methods

- Lecture
- Chapter Outlines(by Students)
- In Class Exercises
- Video Tutorials
- Online Video/Youtube Tutorials/Instruction
- Project Based Instruction
V. Instructional Materials


- Architectural Scale
- .5 Mech Pencil
- .7 Mech Pencil
- .01 -.7 Pigment Markers
- .125 Graph Paper
- 9 x12 Vellum Tablet/book
- USB Portable Hard Drive – Min. – 300GB
- 1 set of Calipers (6”)
- (DRAFTING/Graphics KIT) available at Bookstore
Additional *Recommended* Materials and equipment for CAD 114

- Either a Laptop/Notebook or Desktop computer with following requirements:
  - Quad Core Processor(s)
  - Min 8-12GB RAM Recommended
  - Windows 7 – business (Win 8 business/pro)
  - Video Card with 2GB RAM
    - Video Card recommendations
      - AMD and NVidia
      - (Google: Approved Autodesk Graphic’s Cards)
  - Video Card should support OPEN GL format & approved by Autodesk
    - DO NOT PURCHASE:
      - On Board Video
      - Shared Memory
      - Or any other video card that does not have Open GL Format

- Software from the following sources:
  - [http://students.autodesk.com](http://students.autodesk.com)
  - You must join and register with the Student Educational Community
    - Free Downloads
      - AutoCAD 2015
      - Inventor 2015
      - AutoCAD Architecture 2015
      - Revit Architecture 2015

VI. **Course Content**

- BASIC LAB SKILLS
- INTERPRET ENGINEERING DRAWINGS AND CONTROL DOCUMENTS
  - REVIEW BLUEPRINT NOTES AND DIMENSIONS
- IDENTIFY BASIC TYPES OF DRAWINGS
- LIST THE PURPOSE OF EACH TYPE OF DRAWING
- VERIFY DRAWING ELEMENTS
- PRACTICE GEOMETRIC DIMENSIONING AND TOLERANCING (GD&T) METHODOLOGY
- PERFORM MEASUREMENT/INSPECTION
- IDENTIFY TYPES OF MEASUREMENT
- SELECT PROPER MEASUREMENT TOOLS
- PERFORM MEASUREMENTS WITH HAND HELD INSTRUMENTS
- GEOMETRIC CONSTRUCTIONS
- ORTHOGRAPHIC DRAWINGS
- PICTORIAL DRAWINGS
- BASIC INTERSECTIONS AND DEVELOPMENTS
- DIMENSIONING - USING ANSI/ASME AND ISO STANDARDS
- IDENTIFY TOLERANCES
• APPLY GEOMETRIC TOLERANCES
• REPRODUCE DOCUMENTS
• PREPARE TITLE BLOCKS AND OTHER DRAFTING FORMS
• CREATE TECHNICAL SKETCHES
• PLAN AND ORGANIZE ACTIVITIES
• SELECT APPROPRIATE DRAFTING TECHNIQUES FOR DRAWINGS
• MAINTAIN SUPPORTING DOCUMENTS

Basic CAD Skills

Operate AutoCAD 2014 or later at a proficient level with working knowledge of:

A. How to use a template
B. How to name, save and edit new and existing drawings
C. How to use the various format commands in conjunction with working drawings
   1. Units
   2. Drawing Limits
   3. Text Style

D. How to use the various ribbon panels / tabbed commands
   1. Redraw
   2. Regen
   3. Regen All
   4. Toolbars

E. How to use various ribbon panels / tabbed commands
   1. Spelling
   2. Display Order
   3. Options

F. How to use and setup the DRAW commands
   1. Line
   2. Polyline
   3. Circle Diameter
   4. Circle Radius
   5. Polygon
   6. Rectangle
   7. Arc, Start end Direction and others
   8. Ellipse
   9. Insert Block
   10. Make Block
   11. Hatch
   12. Single Line Text
   13. Multi Line Text
   14. Donut
G. How to use and setup the MODIFY commands
   1. Move
   2. Copy
   3. Mirror
   4. Trim
   5. Stretch
   6. Offset
   7. Array
   8. Scale
   9. Break
  10. Chamfer
  11. Fillet
  12. Edit Text
  13. Erase
  14. Explode

H. How to use the various Object Snap Commands
   1. Snap to endpoint
   2. Snap to Midpoint
   3. Snap to Intersection
   4. Snap to Quadrant
   5. Snap to Perpendicular
   6. Snap to Nearest
   7. Snap to Node
   8. Object Snap Settings

I. How to use the various Dimension Commands
   1. Linear Dimension
   2. Aligned Dimension
   3. Radius Dimension
   4. Diameter Dimension
   5. Angular Dimension
   6. Quick Dimension
   7. Continuous Dimension
   8. Quick Leader
   9. Dimension Edit
  10. Dimension Text Edit
  11. Dimension Styles

J. How to use the various Zoom Commands
   1. Zoom Window
   2. Zoom Dynamic
   3. Zoom All
   4. Zoom Extents
   5. Zoom In
   6. Zoom Out
K. How to use the various Standard & Option Commands
1. New
2. Open
3. Save
4. Print/Plot
5. Print Preview
6. Cut
7. Paste
8. Undo
9. Redo
10. Pan
11. Real time Zoom
12. Properties

L. How to use the various Layer Commands
1. Layer Properties Manager
2. Freeze
3. Thaw
4. Layer On
5. Layer Off
6. Lock
7. Line Type
8. Line Weight
9. Layer Color
10. Line Type, Line Weight, Color “BY LAYER”

M. A three - four week introduction into the basics of Autodesk Inventor Professional.
1. Parametric Solid Modeling Concept
   a. Differences in:
      i. .ipt, .iam, and .idw files are
   b. How to set up a project .ipj
   c. Moving from 2D sketch to 3D model
   d. Fully Constraining the Sketch
      i. Geometrically
      ii. Dimensionally
2. Sketching, modeling, creating and modifying Workplanes
3. 3D modeling Commands
   a. Create
      i. Extrude
      ii. Revolve
      iii. Loft
      iv. Sweep
      v. Rib
      vi. Coil
      vii. Emboss
b. Modify
   i. Hole
   ii. Fillet
   iii. Chamfer
   iv. Shell
   v. Thread

c. Pattern
   i. Rectangular
   ii. Circular
   iii. Mirror

d. Rendering
   i. Inventor Studio
      a. Lighting Styles
      b. Scene Styles
      c. Camera
      d. Local Lights

4. Creating a simple Assembly

5. Inserting .ipt files into an .idw sheet
   i. Basic Dimensioning
      i. Linear
      ii. Baseline

VII. Evaluation

The numerical range for grades will be:

A = 91 - 100 Drawings/Assignments ........................................65%
B = 81 - 90 Tests/Quizzes .................................................25%
C = 71 - 80 Attendance/Class part. .....................................10%(Final Grade)
D = 61 - 70
F = 60 or below

VIII. Attendance

Regular attendance at classes is required. When absence from a class becomes necessary, it is the responsibility of the student to inform the instructor prior to the absence whenever possible. The student is responsible for the subsequent completion of all study missed during an absence. Any instruction missed and not subsequently completed will necessarily affect the grade of the student regardless of the reason for the absence.

IX. Cheating Policy

Students in the CAD/Architecture & Game Technology program will be held to the highest and strictest level of ethical educational conduct. Suspicion of Cheating &/or Plagiarism will result in an Incomplete “I” grade for that project, test or homework assignment. Upon review if it is determined that the student was in violation of the schools cheating policy, he or she will receive the Grade of
“F” which will be calculated as a ZERO “0” averaged in with other grades for the project automatically, may receive an “F” for the course and will have to repeat the course in order to graduate. If the severity of the offense is enough as to warrant it, the student may be kicked out of the CAD program all together.

Cheating / Plagiarism may be defined as but not limited to the following for this curriculum.
- Turning in anything you did not do 100% yourself if it is an “individual” non-team project.
- Copying ANY part of someone else’s work
- Making the effort to copy or steal someone else’s work
- Taking someone else’s CAD electronic file and manipulating it to give the appearance that it is your own work.

### X. Withdrawal Policy

#### Student Initiated Withdrawal Policy

A student may drop or withdraw from a class without academic penalty during the first 60 percent of a session. For purposes of enrollment reporting, the following procedures apply:

- **a.** If a student withdraws from a class prior to the termination of the add/drop period for the session, the student will be removed from the class roll and no grade will be awarded.
- **b.** After the add/drop period, but prior to completion of 60 percent of a session, a student who withdraws from a class will be assigned a grade of “W.” A grade of “W” implies that the student was making satisfactory progress in the class at the time of withdrawal, that the withdrawal was officially made before the deadline published in the college calendar, or that the student was administratively transferred to a different program.
- **c.** After that time, if a student withdraws from a class, a grade of “F” or “U” will be assigned. Exceptions to this policy may be made under documented mitigating circumstances if the student was passing the course at the last date of attendance.

A retroactive grade of “W” may be awarded only if the student would have been eligible under the previously stated policy to receive a “W” on the last date of class attendance. The last date of attendance for a distance education course will be the last date that work was submitted.

Late withdrawal appeals will be reviewed and a decision made by the Director of Student Services.

#### No-Show Policy

A student must either attend face-to-face courses or demonstrate participation in distance learning courses by the last date to drop for a refund. A student who does not meet this deadline will be reported to the Admissions and Records Office and will be withdrawn as a no-show student. No refund will be applicable, and the student will not be allowed to
attend/participate in the class or submit assignments. Failure to attend or participate in a course will adversely impact a student’s financial aid award.

**Instructor Initiated Withdrawal**

A student who adds a class or registers after the first day of class is counted absent from all class meetings missed. Each instructor is responsible for keeping a record of student attendance (face-to-face classes) or performance/participation (DE classes) in each class throughout the semester.

When a student’s absences equal twice the number of weekly meetings of a class (equivalent amount of time for summer session), the student may be dropped for unsatisfactory attendance in the class by the instructor.

Since attendance is not a valid measurement for Distance Education (DE) courses, a student may be withdrawn due to non-performance. A student should refer to his/her DE course plan for the instructor’s policy.

In accordance with the No-Show Policy, a student who has not attended class or requested/accessed distance learning materials by the last day to drop the class and receive a refund must be withdrawn by the instructor during the following week. No refund will be applicable.

When an instructor withdraws a student for unsatisfactory attendance (face-to-face class) or non-performance (DE class), the last date of attendance/participation will be documented. Withdrawal must be completed within five days of a student’s meeting the withdrawal criteria. A grade of “W” will be recorded during the first sixty percent (60%) period of a course. A student withdrawn after the sixty percent (60%) period will receive a grade of “F” or “U” except under documented mitigating circumstances when a letter of appeal has been submitted by the student. A copy of this documentation must be placed in the student’s academic file.

The student will be notified of the withdrawal by the Admissions and Records Office. An appeal of reinstatement into the class may be approved only by the instructor.

**XI. Disability and Diversity Statements**

If you are a student with a documented disability who will require accommodation in this course, please register with the Disability Services Office located in the Counseling Center for assistance in developing a plan to address your academic needs.

The NRCC community values the pluralistic nature of our society. We recognize diversity including, but not limited to, race ethnicity, religion, culture, social class, age, gender, sexual orientation and physical or mental capability. We respect the variety of ideas, experiences and practices that such diversity entails. It is our commitment to ensure equal opportunity and to sustain a climate of civility for all who work or study at NRCC or who otherwise participate in the life of the college.