Revised: July 2012

Luna Community College

2012-2015

Drafting Technology Curriculum Profile

Program Goals

Drafting Technology – The Drafting Technology Program is designed to give students the skills and knowledge to begin a career in the drafting field or to pursue an advanced degree. Students learn the latest AutoCAD software in a modern lab facility. Students of the program are introduced to the field of architecture where practical lab projects and a learn-by-doing environment provides a well-rounded education that will prepare you for a new career in drafting.

You will be able to apply the foundational skills learned to prepare for the
- AutoDesk® AutoCAD® certification
- AutoCAD® Architecture certification
- AutoCAD® Civil 3D® certification
- Autodesk® Inventor™ certification
- Revit® Architecture certification

Upon completion of the Drafting Technology program, graduates will be able to:

1. demonstrate a comprehensive working knowledge of the AutoCAD software and its applications
2. take a conceptual idea to a finalized blueprint plan in AutoCAD and perform construction layout mathematical computations
3. pass industry certification exams
4. enter the workforce as an entry level architectural drafting assistant or continue education at four-year institution

DRAFTING TECHNOLOGY
Associate of Applied Science Degree
Minimum of 63 Credit Hours

Drafting Technology provides students with technical knowledge and skills necessary to utilize computer software to prepare drawings commonly used in the building industry. Students receive training on recent releases of CAD software as well as hands-on experience in problem solving, critical thinking and communication skills. The curriculum is designed to provide a broad-based education with an opportunity for directing one's studies toward specific employment as well as continuation of education at a four-year university.

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Degree Requirements	**Credit Hours: 63**

General Education Core .... **(36 hours)**

Area I. Communications ....(9 hours)
ENG111 Freshman Composition I	3
ENG115 Freshman Composition II	3

SPCH111 Public Speaking -or-	3
SPCH112 Interpersonal Communication	3

Area II. Mathematics ....(4 hours)
MATH180 College Algebra	4

Area III. Laboratory Science ....(8 hours)

Area IV. Social and Behavioral Sciences ....(9 hours)

Area V. Humanities and Fine Arts ....(6 hours)

Program Requirements .... **(21 hours)**
DTEC101 Engineering Graphics and Basic AutoCAD	3
DTEC107 Intermediate AutoCAD	3
DTEC109 Introduction to Architectural Drafting	3
DTEC220 Advanced Drafting and Design	3
DTEC233 3-D Visualization	3
SMET101 Introduction to Science, Math and Engineering Technology	3
SMET105 Computer Use for Technology	3

Approved Electives .... **(6 hours)**
CS105 Introduction to Computer Science	3
DTEC130 Intermediate Architectural Drafting	3
MATH190 Trigonometry	4
SMET117 Introduction to Engineering	3
VOC117 Blueprint Reading and Construction Math	4

Drafting Technology Course Requirements – Course Descriptions and Learning Objectives

DTEC101 Engineering Graphics and Basic AutoCAD   3(2,2)

This course describes basic industrial drafting techniques utilizing conventional drafting equipment and supplies as well as Computer-Aided Drafting (CAD) software. Topics include basic CAD software techniques for two dimensional drafting, multi-view drawings, dimensioning, tolerancing, sectional views, auxiliary views, and pictorial drawings with an emphasis on isometric drawings.

Course Objectives:
- Introduce student to architectural and construction drafting techniques
- Introduce the student to industry standard software
- Prepare students with the fundamentals of drafting and design

Learning Outcomes: upon completion of the course with a grade of "C" (70%) or better, the student will be able to:
- demonstrate a comprehension of basic AutoCAD software commands
- operate the AutoCAD software
- develop site plans that include front, side and plan drawings
- create sectional views
- save files for later viewing

DTEC107   Intermediate AutoCAD   3(2,2)

This course is a continuation of the CAD objectives described in Engineering Graphics and Basic AutoCAD course. Topics include advanced drafting, importing and exporting files, attaching attribute data, database links, three dimensional design, rendering and imaging, and toolbar customization.
Prerequisite: DTEC101

Course Objectives:
- Advance student knowledge in architectural and construction drafting techniques
- Further develop student knowledge in industry standard software
- Advance student knowledge in drafting and design

Learning Outcomes: upon completion of the course with a grade of "C" (70%) or better, the student will be able to:
- generate multi-view drawings
- apply accurate dimensioning to drawings
- utilize paper space and model space for layouts
- place information on appropriate layers.
- utilize toolbars and alias' to assist with drawing techniques
- relate AutoCAD knowledge to current applications used in the modern world.

DTEC109   Introduction to Architectural Drafting   3(2,2)

This course is the study of architectural drafting. Topics to be covered will include discussion/construction of floor plans, footing and foundation plans, elevation plans, typical wall section plans, roof plans, and detail views. Plans will be enhanced with perspective visual aids. The topics of drafting/planning theory will be addressed by utilizing modern CAD techniques.
Prerequisite: DTEC101

Course Objectives:
- Continue with AutoCAD drafting techniques
- Introduce the student to architectural planning theory
- Development of original site and construction plans by students

Learning Outcomes: upon completion of the course with a grade of "C" (70%) or better, the student will be able to:
- develop and design layout plans
- construct plans in multiple views using AutoCAD software
- demonstrate an understanding of basic planning theory through exams and lab projects

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DTEC130   Intermediate Architectural Drafting   3(2,2)

This course is a further study of architectural drafting. Topics to be covered will include site plot plans, and electrical/heating ventilation and cooling (HVAC) plans (if required for building permits). Plans will be enhanced with perspective visual aids. The topics of drafting/planning theory will be addressed by utilizing modern CAD techniques.
Prerequisite: DTEC109

Course Objectives:
- Continue architectural drafting techniques using AutoCAD
- Continue the study of architectural planning theory
- Development of building systems plans including electrical and HVAC

Learning Outcomes: upon completion of the course with a grade of "C" (70%) or better, the student will be able to:
- develop and design layout plans
- construct plans in various views using AutoCAD software
- demonstrate an intermediate level of understanding of basic planning theory through exams and lab projects
- generate a complete set of working drawings with correct information on appropriate layers
- setup plot and page scales according to page size selected
- relate AutoCAD knowledge to current applications in the construction industry

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DTEC220   Advanced Drafting and Design   3(2,2)

This is the capstone course for the drafting program where the student will complete a project with knowledge gained from the Intermediate AutoCAD and Introduction to Architectural Drafting courses. Emphasis will be directed toward furthering the students' expertise of CAD software with topics including advanced drafting and design of structures. The topic of drafting/planning theory will be further addressed by utilizing modern CAD techniques. The laboratory component will have a final project as a measure of hands-on skills and overall competency.
Prerequisites: DTEC107 and DTEC109

Course Objectives:
- Investigate advanced architectural drafting techniques
- Investigate advanced architectural planning theory
- Generate a complete set of site/construction plans with appropriate layers and views

Learning Outcomes: upon completion of the course with a grade of "C" (70%) or better, the student will be able to:
- general multi-view drawings using paper space and model space
- apply advanced dimensioning techniques to drawings using command promptly entry
- arrange paper space and model space views for layouts
- apply three-dimensional techniques to past drawings
- relate AutoCAD knowledge to current applications used in the construction industry

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DTEC233   3-D Visualization   3;(2,2)

3-D Visualization investigates three-dimensional (3-D) modeling using AutoCAD Revit and other 3-D design tools to communicate engineering design ideas. Topics to be covered will include creating sketches, modeling of individual components, modeling of assemblies, creating exploded views of assemblies, creating orthographic views of individual components and assemblies, outputting to a plotter or printer, storage/retrieval of engineering designs, and a variety of more complex components and assemblies as well as architectural modeling. *Prerequisite: DTEC107.*

Course Objectives:
- Investigate 3-d design using REVIT and other programs
- Introduce the student to architectural modeling in 3-d
- Development of site/construction plans by students

Learning Outcomes: upon completion of the course with a grade of "C" (70%) or better, the student will be able to:
- Create three-dimensional views of sketches, components, and assemblies.

- Create orthographic views of individual components and assemblies
- Send designs to 3-d plotter

MATH190 **Trigonometry** **4(4,0)**

This course is the study of trigonometric functions, radian and degree measure, graphs, basic trigonometry identities and inverse trigonometric functions, study of conic sections and basic geometry principles. *NM Common Course Number: MATH1213. Prerequisite: MATH180 or equivalent COMPASS/ACT score.*

Course Objectives:
- Introduce students to trigonometric functions
- Develop advanced skills to prepare for calculus
- Develop critical thinking and problem solving skills

Learning Outcomes: upon completion of the course with a grade of "C" (70%) or better, the student will be able to:
- Demonstrate and understanding of trigonometric functions as they apply to:
  - Angles and measures
  - Right angle trigonometry
  - Trigonometric functions of any angle
  - Graphs of sine and cosine functions
  - Inverse trigonometric functions
- Demonstrate concepts of analytic trigonometry related to:
  - Fundamental identities
  - Solving trigonometric equations
  - Sum and difference formulae
- Apply the laws of sines and cosines
- Demonstrate concepts in analytic geometry related to:
  - Circles and parabolas
  - Ellipses
  - Hyperbolas

CS105 **Introduction to Computer Science** **3:(2,2)**

This course is an introduction to computer science and computer information systems. The intent of this course is to prepare students and provide them with the terminology and a brief understanding of concepts within the computing field. Topics will include computer history, algorithms, computer architecture, programming languages, applications, social issues and ethics. Students should have an understanding of how to use a computer and basic software such as MS Word and the internet prior to taking this course.

Course Objectives:
- Have students become versed in the terminology of computer science
- Introduce students to programming and applications
- Address social and ethical issues related to the fast and ever-changing field of computers

Learning Outcomes: upon completion of the course with a grade of a 'C' or better the student will be able to:
- Summarize and interpret the history and evolution of computer systems.
- Demonstrate a knowledge of the algorithmic foundation of computer science
- Demonstrate a basic knowledge of introductory programming languages
- Distinguish between the hardware and software of a computer system
- Identify various application as well as social issues involving computers
- Apply a basic understanding of networking, Internet, and Webpage design

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SMET101   Intro to Science, Math, & Engineering Technology   3:(3,0)

This course is designed to develop a better understanding of the learning process within the domain of science, math and engineering technology. The course will use flexible learning strategies and creative problem solving techniques to include critical thinking skills. The ultimate goal of the course is to assist students in successfully meeting the demands of the technology field.

Course Objectives: The objectives of this course include introducing students to the various fields within science and engineering along with exploring the potential careers and ethical issues. The course offers strategies for success in the STEM fields at the community college and beyond.

Learning Outcomes: Upon completion of the course with a "C" or better the student will be able to:
- Select from a variety of problem solving strategies and use them to design potential problem solutions.
- Apply collaborative learning and teamwork skills in class assignments and team projects.
- Identify majors and career opportunities in engineering disciplines and be able to explain academic decisions.
- Identify and describe personal and professional strengths, abilities, and goals.
- Develop and initiate an individualized Academic Achievement Plan (AAP).
- Identify and effectively use LCC campus resources and services.

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SMET105   Computer Use for Technology   3:(2,2)

This course is the study of the fundamentals of computer technology software used in engineering technology fields. Emphasis will be placed on technical and scientific computer applications. Topics to be covered will include an introduction to computer

concepts, Windows, Microsoft Word, Excel, Access, and PowerPoint, and other specific software applications used to interface various engineering technologies fields.

Course Objectives: The objective of the course is to provide students with the computer basics for success in the STEM disciplines. Students will become proficient at basic Microsoft programs and will be introduced to AutoCAD software.

Learning Outcomes: upon completion of the course with a grade of "C" (70%) or better, the student will be able to:
- Demonstrate a knowledge of the course content through quizzes, projects, and exams
- Apply the concepts learned in class to unit projects
- Demonstrate a working knowledge of both Microsoft and AutoCAD software
- Demonstrate a working knowledge of hardware and components

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SMET117   **Introduction to Engineering**   **3:(2,2)**

This course introduces the engineering design process using a project-oriented, team-based approach. Students will employ engineering graphics and computational skills using computer applications such as AutoCAD and spreadsheets to solve engineering problems. Lab topics will include design and fabrication of scale models with specific projects addressing sound decision making, the ability to communicate effectively, defining and solving problems and functioning efficiently in a team environment. _Prerequisites: DTEC 101 and SMET 105._

Course Objectives: This course introduces the concepts of static and dynamic forces in engineering and explores the engineering fields. The course promotes teamwork and collaboration to problem solve in the field of engineering.

Learning Outcomes: upon completion of the course with a grade of "C" (70%) or better, the student will be able to:
- Demonstrate teamwork skills
- Demonstrate a basic understanding of statics and dynamics in the engineering field
- Fabricate scale models for testing purposes
- Employ AutoCAD and spreadsheet applications to solve problems.

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Assessment
Luna Community College defines assessment as a process that will lead to the improvement of student learning. The process must follow four steps as illustrated below.

LCC Assessment Plan
All course offerings, including degree and certificate programs, at Luna Community College are required to follow the four-step assessment process. They include:
1. A list of expected learning outcomes
2. Assessment tools that directly measure those learning outcomes
3. The results of the data, and
4. How the data will be used to improve student learning

Academic Departments at Luna Community College are required to participate in semester "Improving Student Learning" assessment reporting and Student Learning Outcomes Assessment (SLOA) Committee presentations. Every semester, academic departments focus on specific learning outcomes with a targeted student population.

Faculty are selected to participate in SLOA; selected faculty participate in developing assessment methods and procedures for their particular course or courses. The faculty give oral presentations at the end of the semester and information gathered is disseminated among SLOA members, faculty and staff. The purpose is to provide a baseline for future improvements.

Visit our web site at www.luna.edu to review LCC's Improving Student Learning (ISL) reports. LCC also abides by the New Mexico state competencies for general education.

Appendix "A"

LUNA COMMUNITY COLLEGE
Standard "Minimal" Requirements for Course Syllabus

Course
course title and other course information including meeting times, dates, room number, credits, semester, prerequisites and/or co-requisites

Faculty
information about the instructor and his or her contact information (e.g., phone number and email). List time and day of office hours for full time faculty

Course Description
use catalog description, 2012-2015

Expectations of Students
What do you expect from your students? For example, description of students' responsibilities in the learning process; how you hope the students will approach the course subject/content; take responsibility for their learning; the amount of study time expected in the course, and suggestions on how to succeed in the course.

Course Learning Outcomes (Competencies)
this section will include a list of skills or techniques students will develop from the course. This list will consists of a minimum of four to six quantifiable statements about what students will be able to do after completing the course.

New Mexico CORE Competencies
If teaching a CORE course, the State HED competencies must be stated (e.g., Communications, Mathematics, Laboratory Science, Social & Behavioral Sciences, Humanities & Fine Arts).

Methods of Measuring Learning Outcomes (Competencies)
What tools are used to measure student success based on the learning outcomes?

Evaluation	Indicate how the student will earn a particular grade, such as information about assignments including types of assignments, nature of exams (e.g., take home, open book, in-class) due dates, grading criteria and so forth.
Course Schedule	Add a tentative schedule indicating the course content that will be covered throughout the course (e.g., eight week or sixteen week schedule).
Policies	Include policies such as attendance, academic responsibilities, late assignments, missed exams, cell phones, etc. Add a statement that indicates: for additional student information, refer to the 2012-2015 Student Handbook
Grading Standard	Refer to the LCC 2012-2015 Catalog
Textbook(s)	Name of required textbooks(s) and any recommended materials. Include ISBN number(s)
Important Dates	List important dates such as last day to withdraw from the course, holidays, add/drop, midterm, final exam week, spring break and other important dates.
ADA Statement	Add a statement regarding accommodations for students with disabilities. See Academic Policies & Procedures Manual 2012-2013 for additional information.
Academic Integrity	See Academic Policies and Procedures Manual 2012-2013 for additional information.
Syllabus Revisions or Changes	Add a statement that indicates the syllabus is subject to change
Internet Courses	See Academic Policies & Procedures Manual 2012-2013 for additional information.