COURSE TITLE:
ARCHITECTURAL DRAFTING
GRADES 11 & 12

LENGTH:
FULL YEAR

SCHOOLS:
RUTHERFORD HIGH SCHOOL
RUTHERFORD, NEW JERSEY

DATE:
Fall 2014
1. **INTRODUCTION/OVERVIEW/PHILOSOPHY**

This is a course in which basic fundamentals of architecture design are examined and perfected. Studies detailing the various systems of a complex residence are studied. Materials, construction, and the components of each system are discussed. Design will be the main emphasis for this level and the student should have a good background in basic mathematics. Drawing and/or design emphasis will focus on CAD (computer aided drafting) using AutoCad. Projects can include a full set of working and presentation drawings for clients and scale model construction of drawn projects.
2. OBJECTIVES

A. NEW JERSEY CORE CURRICULUM CONTENT STANDARDS FOR TECHNOLOGY

For a complete copy of the NJ Core Curriculum Content Standards for Technology, please visit the following websites:

http://www.state.nj.us/education/cccs/

STANDARD 8.1

EDUCATIONAL TECHNOLOGY: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

STANDARD 8.2

TECHNOLOGY EDUCATION, ENGINEERING, AND DESIGN: All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment.
B. COURSE OUTLINE

All standards cited in course outline are through Grade 12.

I. Introduction to CAD/ Basic Drawing Design/Architectural Design

A. Architectural history and styles
   1. Development of architectural forms
   2. Development of architectural styles
   3. Influence on early American architecture
   4. Early and later American styles
   5. Function of architecture

B. Fundamentals of design
   1. Architecture and design
   2. Elements of design
   3. Principles of design

II. Architectural drafting fundamentals

A. Drafting scales and instruments

B. Architectural drafting conventions
   1. Architectural drawings
   2. Architectural conventions
   3. Architectural drawing techniques

III. Basic area design

A. Environmental design factors

B. Indoor living areas
   1. Living area plans
   2. Living room
   3. Dining room
   4. Family room
   5. Recreation rooms

C. Outdoor living areas
   1. Porches
   2. Patios
   3. Lanais
   4. Swimming pools

D. Traffic areas and patterns
E. Kitchens

F. General service area
   1. Utility rooms
   2. Garage and carports
   3. Driveways
   4. Workshops
   5. Storage areas

G. Sleeping areas
   1. Bedrooms
   2. Baths

IV. Basic architectural drawings

A. Designing floor plans
   1. Floor plan development and design process
   2. Functional space planning
   3. Special needs

B. Drawing floor plans
   1. Types of floor plans and symbols
   2. Multi-level floor plans
   3. Floor plan dimensioning

C. Designing elevations
   1. Relationship with floor plan
   2. Elements of design and elevations
   3. Design sequence

D. Drawing elevations
   1. Elevation projection
   2. Elevation from a floor plan
   3. Interior elevations
   4. Elevation dimensioning and symbols
   5. Landscape on elevation drawings

E. Sectional, detail, and cabinetry drawings
   1. Sectional drawings
   2. Full sections
   3. Detail sections
F. Site development plans
   1. Site analysis
   2. Zoning ordinances
   3. Survey, plot, and landscape plans
   4. Landscape rendering
   5. Site details
   6. Schedules

V. Presentation methods
   A. Pictorial drawings
   B. Architectural renderings
   C. Architectural models

VI. Foundation and construction systems
   A. Principles of construction
   B. Foundations and fireplace structures
   C. Wood frame systems
   D. Masonry and concrete systems
   E. Disaster prevention design

VII. Framing systems
   A. Floor framing drawings
   B. Wall framing drawings
   C. Roof framing drawings

VIII. Electrical and mechanical design and drawings
   A. Electrical specifications
   B. Comfort-control systems (HVAC)
   C. Plumbing drawings
IX. Support services

A. Schedules and specifications
B. Building costs and financial planning
C. Codes and legal documents

Student Outcomes:

After successfully completing this course, the student will:

• Understand the use of drafting tools in the performance of drafting fundamentals applied to the making of architectural drawings.
• Identify careers available within the engineering design team.
• Develop an appreciation of the positive aspect of CAD in relationship to traditional drawing methods.
• Develop an appreciation of good design and architecture.
• Appreciate the importance of computers as applied to drawing and design.
• Explain the advantages of using a CAD program to create notes and other text on a drawing.
• Apply measurements, notes and symbols to drawings as needed.
• Develop the habit of making sketches and drawings for conveying ideas to others.
• Use community resources in gathering project information.

3. PROFICIENCY LEVELS

This course is open to grades 11 – 12.

4. METHODS OF ASSESSMENT

• Student Assessment

The teacher will provide a variety of assessments, including:

  o Teacher observation
  o Individual and group critique
  o Completed projects
  o Display of students’ work
  o Tests/quizzes
  o Student participation
  o Ability to use CAD techniques and tools
• **Curriculum/Teacher Assessment**

There will be an ongoing self and department assessment to determine the effectiveness of all aspects of the Architectural Drafting program, including:

- Teacher/departmental meetings
- Teacher observations
- Completed projects
- Self evaluations/PDP
- Supervisor evaluations
- Suggestions for changes to supervisor

5. **GROUPING**

Prerequisites are a passing grade in Engineering Drawing 1 and Engineering Drawing 2.

6. **ARTICULATION/SCOPE AND SEQUENCE/TIME FRAME**

Course length is full year and is offered to students in grades 11 -12.

7. **RESOURCES**

Texts/Supplemental Reading/References:

- **National Building Code**
- **Borough of Rutherford Zoning Ordinance**
- **Borough of Rutherford Building Code**
- AutoCad Software for PC laptops in STEM Lab
8. METHODOLOGIES

The following methods of instruction are suggested:
- Lecture
- Demonstration
- Practice projects
- Heterogeneous ability grouping
- Individualized projects

9. SUGGESTED ACTIVITIES

The instructor will assign a variety of projects and activities using various pieces of equipment and a variety of simulators and models.

10. INTERDISCIPLINARY CONNECTIONS

This course reinforces concepts taught in:
- Technology and computer courses
- Mathematics
- Life skills

Where appropriate the instructor will incorporate interdisciplinary study.

11. PROFESSIONAL DEVELOPMENT

As per the PDP/100 hour statement, the teacher will continue to improve expertise through participation in a variety of professional development opportunities.
## 12. CURRICULUM MAP – ARCHITECTURAL DRAFTING

<table>
<thead>
<tr>
<th>Class</th>
<th>September</th>
<th>October</th>
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| Architectural Drafting | - Introduction and overview of course  
- Careers in drafting  
- Design and sketching  
- Review of CAD software (AutoCad)  
- Review of engineering drawing (CAD)  
- History of architecture  
* English architecture  
* French architecture  
* Spanish & Italian  
- Architectural styles  
* Early American styles  
+ New England Colonial  
+ Mid-Atlantic Colonial  
+ Dutch Colonial  
+ Southern Colonial  
* Later American styles  
+ Victorian  
+ Ranch style  
* Development of architectural forms  
+ Post & Lintel  
+ The Arch, Vault, & Dome  
+ The Gothic Arch | - Getting started using AutoCad  
* Setting preferences  
* Layer scale  
* Print area  
- Drawings and documents  
- Reading architectural drawings  
* Coding system  
* Title blocks  
* Cross referencing  
* Callouts  
- Drafting scales & instruments  
* Architect’s scale  
* Civil Engineer’s scale  
* Metric scale  
- Drafting instruments  
- Architectural conventions  
* Types of lines  
* Lettering  
- Architectural Drawing Techniques  
* Rendering & sketching  
- Foundation / Construction | - Architecture & design  
- Elements of design  
* Line, form, space, & color  
* Light and shadow  
* Texture & materials  
- Principles of design  
* Balance  
* Rhythm & repetition  
* Emphasis  
* Proportion  
* Unity & transition  
- Architectural drawing  
* Types of drawings  
+ Plans  
+ Elevations  
+ Sections  
+ Detail drawings  
- Architecture & design  
- Elements of design  
- Principles of design | - Types of CAD Drawings  
* 2-D drawings  
+ X, Y Coordinates  
* 3-D drawings  
+ X,Y,Z coordinates  
+ Wireframe  
+ Surface model  
+ Solid model  
- Architectural application  
* Creating a floor plan  
* Creating an elevation  
- Designing floor plans | - Environmental design factors  
* Orientation  
+ Energy orientation & sources  
+ Solar orientation  
+ Land & a structure  
+ Wind control  
* Ergonomic planning  
+ Human dimensions  
+ Safety Factors  
* Ecology  
+ Land pollution  
+ Air pollution  
+ Water pollution  
+ Visual pollution  
+ Noise pollution  
+ Electronic hazards  
- Indoor Living Areas  
* Living Area Plans  
+ Open plans  
+ Closed plans  
+ Combined Plans  
- Drawing floor plans  
- Framing system |
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