

## ARCHITECTURAL DRAFTING AND DESIGN II

*Architectural Drafting and Design II* presents a history and survey of architecture and focuses on the creative design of buildings in a studio environment. This course covers problems of site analysis, facilities programming, space planning, conceptual design, proper use of materials, and selection of structure and construction techniques. Students develop presentation drawings, and give oral presentations and critiques. Generation of form and space is addressed through basic architectural theory, related architectural styles, design strategies, and a visual representation of the student's design process. This course will focus on advanced Computer Aided Design (CAD) techniques, including fundamentals of three-dimensional modeling for design. It includes an overview of modeling, graphical manipulation, part structuring, coordinate system, and developing strategies of modeling. Advanced CAD will enable the student to make the transition from 2D drafting to 3D modeling. Various Architectural software packages and applications may be used.

- DOE Code: 5652
- Recommended Grade Level: Grade 12
- Recommended Prerequisites: Architectural Drafting and Design I
- Credits: 2-3 credits per semester, maximum of 6 credits
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- This course is aligned with postsecondary courses for Dual Credit:
  - Ivy Tech
    - DESN 105-Architectural Design I
    - DESN 113-Intermediate CAD
  - Vincennes University
    - ARCH 221- Advanced Architectural Software Applications

### **Dual Credit**

This course provides the opportunity for dual credit for students who meet postsecondary requirements for earning dual credit and successfully complete the dual credit requirements of this course.

### **Application of Content and Multiple Hour Offerings**

Intensive laboratory applications are a component of this course and may be either school based or work based or a combination of the two. Work-based learning experiences should be in a closely related industry setting. Instructors shall have a standards-based training plan for students participating in work-based learning experiences. When a course is offered for multiple hours per semester, the amount of laboratory application or work-based learning needs to be increased proportionally.

### **Career and Technical Student Organizations (CTSOs)**

Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in SkillsUSA, the CTSO for this area.

## Content Standards

### Domain – History of Architectures

**Core Standard 1** Students evaluate historical architecture to understand the styles and trends.

#### Standards

- ADDII-1.1 Identify the distinguishable design characteristics of the significant architectural styles in the history of civilizations
- ADDII-1.2 Integrate history, theory, technology and structures to influence formal and conceptual design manifested in materials, details, language and imagery

### Domain – Using the Design Process and Tools in Architectural Planning

**Core Standard 2** Students establish design concepts to meet the project requirements.

#### Standards

- ADDII-2.1 Comprehend and discuss the purpose and need for “facilities programming”
- ADDII-2.2 Conceptualization of sketches and diagrams that demonstrate problem solving of programmatic issues
- ADDII-2.3 Utilize fundamentals of formal conceptual relationships, design methodology, and design process
- ADDII-2.4 Develop basic spatial and compositional ideas introduced through the study of typology, diagrams, and process of conceptualization
- ADDII-2.5 Demonstrate an ability to represent ideas in form and space, as a conceptual and cultural response to program, type, basic building construction, architectural language and design methods
- ADDII-2.6 Apply basic building codes in the context of social, political, civic and environmental responsibilities relative to our society
- ADDII-2.7 Analyze forces and loads on a structure
- ADDII-2.8 Identify line weights and how they relate to specific line types
- ADDII-2.9 Create standard drawings for commercial building structures

### Domain – Utilization of CAD Software in Architecture

**Core Standard 3** Students utilize advanced commands to develop drawings to meet industry standards.

#### Standards

- ADDII-3.1 Demonstrate competence in the use of CAD software through assignments
- ADDII-3.2 Modify drawing elements using advanced editing commands
- ADDII-3.3 Accurately complete assignments using advanced CAD commands
- ADDII-3.4 Accurately complete assignments using: xref, design center, advanced plotting techniques, advance dimensioning, viewports, and materials library
- ADDII-3.5 Troubleshoot and problem solve mathematical concepts by utilizing CAD tools

### Domain – Solving Advanced Design Challenges in Architectural Drafting

**Core Standard 4** Students integrate design concepts to build architectural construction drawings.

#### Standards

- ADDII-4.1 Manage 3D space
- ADDII-4.2 Create, modify, and use 3D wire frame, surface, and solid models
- ADDII-4.3 Construct a surface or a solid model

- ADDII-4.4 Create production drawings of the 3D models
- ADDII-4.5 Create 2D drawings from 3D Architectural objects
- ADDII-4.6 Design a commercial floor plan
- ADDII-4.7 Create commercial roof plans
- ADDII-4.8 Create floor systems and reflected ceiling plans
- ADDII-4.9 Design commercial elevations
- ADDII-4.10 Draw sections
- ADDII-4.11 Produce production schedules
- ADDII-4.12 Create photo-realistic renderings
- ADDII-4.13 Create construction documents
- ADDII-4.14 Create a final project
- ADDII-4.15 Implement dimensioning in drawings
- ADDII-4.16 Render an object
- ADDII-4.17 Introduce lighting to a scene
- ADDII-4.18 Attaching materials from the materials library to objects

**Domain – Careers in Architectural Drafting**

**Core Standard 5** Students evaluate and explore architectural careers and opportunities.

**Standards**

- ADDII-5.1 Compare architectural drafting careers
- ADDII-5.2 Investigate architectural drafting opportunities offered by a technical school or college
- ADDII-5.3 Determine architectural drafting occupation wages/salaries
- ADDII-5.4 Explore architectural drafting job outlook information
- ADDII-5.5 Participates job shadowing of an architectural job
- ADDII-5.6 Research international architectural drafting opportunities