The Interior Building Architecture Program provides students with a background in Architectural Drafting. Students who successfully complete the suggested program will be capable of doing detail and layout work normally expected of the drafting aide or technician. The program is designed to provide transfer opportunities in the Environmental Design and/or Construction Management disciplines as well as opportunities for students to qualify for employment in a variety of positions within related industries.

Program Maps

Architectural Design Technology, A.S. Degree
Architectural Design Technology, Building Information Modelling (BIM) and/or Interior Building Architecture (IBA), A.S. Degree
Architectural Design Technology, Interior Building Architect, A.S. Degree

Department Chair
Ryan Connally

Phone
(916) 691-4300

Email
HarrisC2@crc.losrios.edu

Associate Degrees

A.S. in Building Information Modeling (BIM)

This Degree program provides students with a background in Computer-Aided Drafting & Design (CADD) and Building Information Modeling (BIM) for application to the architectural building space and design of buildings, interior space analysis and design to facilitate selection of materials & products promoting energy conservation, ecologically sustainable building space and building design using Green Building/LEED point principles.
Students who successfully complete the suggested program will be capable of performing pre-modeling (massing), modeling, and developing drawing documents normally expected of architects, designers, and drafting technicians.

The program is designed to provide job market skills, and college transfer skill opportunities within the Architectural Design disciplines and/or Construction Management as well as opportunities for students to qualify for employment in a variety of positions within the related industries. Additionally, this program offers opportunities for working professionals to take these courses for professional development to update and improve their skills in the Building Information Modeling field.

Note: It is highly recommended that each student keep a complete record of work/projects (i.e., a portfolio) to present for evaluation by university/college program advisors and/or employers.

This degree program utilizes various Building Information Modeling (BIM) software components, such as Revit Architecture, MEP, and Structure to prepare students for careers and college transfer in the area of Interior Building Architecture, Architecture, and Building Information Modeling (BIM), with an emphasis in the Architectural Technology area.

Highlights: State-of-the-art computer lab and software.

Catalog Date: June 1, 2020

Degree Requirements

### Course Requirements

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<thead>
<tr>
<th>COURSE CODE</th>
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<tbody>
<tr>
<td>ADT 300</td>
<td>Architectural Sketching and Modeling I</td>
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<tr>
<td>ADT 302</td>
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<tr>
<td>ADT 310</td>
<td>Architectural Computer-Aided Drawing I</td>
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<tr>
<td>ADT 314</td>
<td>Architectural 3D Modeling</td>
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<td>ADT 320</td>
<td>Architectural Design Technology - Building Information Modeling (BIM) I</td>
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<td>ADT 324</td>
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<td>ADT 326</td>
<td>Architectural Design Technology - Building Information Modeling (BIM) IV</td>
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<tr>
<td>ADT 498</td>
<td>Work Experience in Architecture Design Technology</td>
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<td></td>
<td><strong>Total Units:</strong></td>
<td><strong>25-28</strong></td>
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</tbody>
</table>

### Highlights

- State-of-the-art computer lab and software.
- Utilizes various Building Information Modeling (BIM) software components, such as Revit Architecture, MEP, and Structure.

### Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO #1: Research, evaluate and apply energy conservation, ergonomic considerations, American Disabilities Act (ADA), ecologically sustainable design solutions and principles (Green Building/LEED) to design projects.
- SLO #2: Formulate, categorize and identify Green Building/LEED certified materials and systems for use in residential and commercial projects.
- SLO #3: Organize, categorize and illustrate the development of initial models into architectural design documents, individually or through work group methods.
- SLO #4: Demonstrate, summarize and recall visual and verbal note taking methods and apply the information into models and finalized residential and commercial project designs.
- SLO #5: Assess, compose and analyze architectural graphic information effectively to create solutions from a criteria matrix, bubble diagram and block diagramming methods.
- SLO #6: Choose, assemble and distinguish the necessary skills in developing marketable BIM/CADD skills for university transfer and the job market, through measurable methods in project development and presentations.

### Career Information

Architectural Draftsperson, Designer/Technician, Planning Assistant, CADD Technician, BIM Technician, Facilities/Space Planner.

### A.S. in Interior Building Architecture

This Associate Science program utilizes CADD and Building Information Modeling (BIM) software to prepare students for careers in the area of Interior Building Architecture, Architecture, with an emphasis in Architectural Design.

Students who successfully complete the suggested program will be capable of performing pre-modeling (massing), modeling, and developing drawing documents normally expected of architects, designers, and technicians.

The program is designed to provide job market skills, college transfer opportunities in the Interior Building Architecture, Architecture and/or Construction Management disciplines as well as opportunities for students to qualify for employment in a variety of positions within related industries. Additionally, this program offers opportunities for working professionals to take these courses for professional development to update and improve their skills in the Interior Building Architecture field.

NOTE: It is highly recommended that each student keep a complete record of work to present for evaluation by university/college program advisors and/or employers.

This degree program utilizes CADD and Building Information Modeling software components, such as Revit Architecture, MEP, and Structure to prepare students for careers in Interior Building Architecture, Architecture, Building Information Modeling (BIM), with an emphasis in Architectural Technology field.

Highlights: State-of-the-art computer lab and software.

Catalog Date: June 1, 2020

Degree Requirements

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<tr>
<td>ADT 322</td>
<td>Architectural Design Technology - Building Information Modeling (BIM) II</td>
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</tr>
<tr>
<td>ARCH 329</td>
<td>Architectural Working Drawings</td>
<td>4</td>
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</tbody>
</table>
The Interior Building Architecture Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

### Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO #1: Research, evaluate and apply energy conservation, ergonomic considerations, American Disabilities Act (ADA), ecologically sustainable design solution and principles (Green Building/LEED) to design projects.
- SLO #2: Formulate, categorize and identify Green Building/LEED certified materials and systems for use in residential and commercial projects.
- SLO #3: Organize, categorize and illustrate the development of initial models into architectural design documents, individually or through work group methods.
- SLO #4: Demonstrate, summarize and recall visual and verbal note taking methods and apply the information into models and finalized residential and commercial project designs.
- SLO #5: Assess, compose and analyze architectural graphic information effectively to create solutions from a criteria matrix, bubble diagram and block diagramming methods.
- SLO #6: Choose, assemble and distinguish the necessary skills in developing marketable BIM/CADD skills for university transfer and the job market, through measurable methods in project development and presentations.

### Career Information

Architectural Draftsperson, Designer/Technician, Planning Assistant, CADD Technician, BIM Technician, Facilities/Space Planner.

### Certificates of Achievement

#### Building Information Modeling (BIM) Certificate

This Certificate program provides students with a background in Computer-Aided Drafting & Design (CADD) and Building Information Modeling (BIM) for application to the architectural building space and design of buildings, interior space analysis and design to facilitate selection of materials & products promoting energy conservation, ecologically sustainable building space and building design using Green Building/LEED point principles.

Students who successfully complete the suggested certificate will be capable of performing pre-modeling (massing, modeling, and developing drawing documents normally expected of architects, designers and drafting technicians).

The program is designed to provide job market skills and opportunities within the Architectural Design disciplines and/or Construction Management as well as opportunities for students to qualify for employment in a variety of positions within the related industries. Additionally, this certificate offers opportunities for working professionals to take these courses for professional development to update and improve their skills in the Building Information Modeling (BIM) field.

This certificate program utilizes various Building Information Modeling (BIM) software components, such as Revit Architecture, MEP, and Structure to prepare students for careers in the job market in the area of Interior Building, Architecture, Architecture, Building Information Modeling (BIM), with an emphasis in the Architectural Technology field.

NOTE: Highlights - State-of-the-Art computer lab and software.

**Catalog Date:** June 1, 2020

### Certificate Requirements

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<td>ADT 320</td>
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<td>ADT 322</td>
<td>Architectural Design Technology - Building Information Modeling (BIM) II</td>
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<tr>
<td>ADT 498</td>
<td>Work Experience in Architecture Design Technology</td>
<td>1 - 4</td>
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</table>

**Total Units:** 19 - 22

### Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO #1: Research, evaluate and apply energy conservation, ergonomic considerations, American Disabilities Act (ADA), ecologically sustainable design solution and principles (Green Building/LEED) to design projects.
- SLO #2: Formulate, categorize and identify Green Building/LEED certified materials and systems for use in residential and commercial projects.
- SLO #3: Organize, categorize and illustrate the development of initial models into architectural design documents, individually or through work group methods.
- SLO #4: Demonstrate, summarize and recall visual and verbal note taking methods and apply the information into models and finalized residential and commercial project designs.
- SLO #5: Assess, compose and analyze architectural graphic information effectively to create solutions from a criteria matrix, bubble diagram and block diagramming methods.
- SLO #6: Choose, assemble and distinguish the necessary skills in developing marketable BIM/CADD skills for university transfer and the job market, through measurable methods in project development and presentations.

### Career Information

Architectural Draftsperson, Designer/Technician, Planning Assistant, CADD Technician, BIM Technician, Facilities/Space Planner.
Green Buildings Certificate

The purpose of this certificate is to develop job skills and an understanding of green strategies for high performance buildings and livable communities. It is focused at students and professionals in the fields of architecture; construction; building management; construction management; building inspection; design technology; landscape; and planning, who want to acquire a comprehensive knowledge of an integrated, economic life-cycle approach to the design of the built environment. It includes study of green rating systems, material choices and environmental strategies for a livable, sustainable future.

Catalog Date: June 1, 2020

Certificate Requirements

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>ARCH 342</td>
<td>Introduction to Green Buildings</td>
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<tr>
<td>CMT 310</td>
<td>Materials of Construction</td>
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<td><strong>A minimum of 12 units from the following:</strong></td>
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<tr>
<td>ARCH 332</td>
<td>Design Awareness (3)</td>
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<tr>
<td>ARCH 334</td>
<td>Advanced Design in Three Dimensions (3)</td>
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<tr>
<td>ADT 320</td>
<td>Architectural Design Technology - Building Information Modeling (BIM) I (3)</td>
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<tr>
<td>BIT 150</td>
<td>California Energy Code – Building Energy Efficiency Standards (3)</td>
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<td>CONST 143</td>
<td>Photovoltaic Systems (3)</td>
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<td>ECON 306</td>
<td>Environmental Economics (3)</td>
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<td>GEOG 302</td>
<td>Environmental Studies &amp; Sustainability (3)</td>
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<td>GEOG 305</td>
<td>Global Climate Change (3)</td>
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<td>GEOG 306</td>
<td>Weather and Climate (3)</td>
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<td><strong>Total Units:</strong></td>
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</table>

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO 1: Establish meaningful ethical, social and environmental objectives for buildings and communities based on the values of energy and resource conscious design.
- Compare and contrast societal and economic implications of utilizing renewable and non-renewable energy sources.
- Compare and contrast the effect of contextual issues and evaluate their impact on energy consumption, environment and the beneficial experience of interior and exterior spaces.
- PSLO 2: Identify and articulate issues related to the choice of various building, landscape and environmental systems; ideate responsive solutions; and compare the alternatives in making effective, sustainable decisions.
- Analyze and calculate energy use to make informed, environmentally-sound and economic choices to satisfy human needs for comfort and aesthetics.
- Explain the concepts of resource conservation and waste reduction and make sustainable design choices related to materials and construction.
- Develop a comprehensive understanding of green rating systems, livable communities strategies and the ability to apply these concepts in decision-making.
- PSLO 3: Demonstrate independent learning, teamwork and continuing education habits that will help to encourage a life long pursuit of knowledge.
- To use a team work process to identify issues, analyze criteria, research and apply learned principles to synthesize solutions to specific design projects.
- To demonstrate habits of visual note making and independent research by developing a sketch and notebook to record learning.

Career Information

This certificate helps to develop the knowledge base related to sustainable green buildings and environments for the careers of architecture, construction, construction management, building inspection, horticulture, landscape architecture and architectural design technology.

Interior Building Architecture Certificate

This certificate program utilizes CADD and Building Information Modeling (BIM) software to prepare students for careers in the area of Interior Building Architecture with an emphasis in Architectural Design.

Students who successfully complete the suggested program will be capable of performing pre-modeling (massing), modeling, and developing drawing documents normally expected of architects, designers and drafting technicians.

The program is designed to provide job market skills and opportunities within the Architectural Design disciplines and/or Construction Management as well as opportunities for students to qualify for employment in a variety of positions within the related industries. Additionally, this program offers opportunities for working professionals to take these courses for professional development to update and improve their skills in the interior building architecture field.

Note: It is highly recommended that each student keep a complete record of semester work/projects (i.e., a portfolio) to present for evaluation by employers.

This degree program utilizes various Building Information Modeling (BIM) software components, such as Revit MEP and Structure to prepare students for careers in Interior Building Architecture, Architecture, Building Information Modeling (BIM), with an emphasis in the Architectural Technology area.

Highlights: State-of-the-Art computer lab and software.

Catalog Date: June 1, 2020

Certificate Requirements

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<tr>
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<td>ADT 300</td>
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<tr>
<td>ADT 302</td>
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<tr>
<td>ADT 310</td>
<td>Architectural Computer-Aided Drawing I</td>
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<tr>
<td>ADT 320</td>
<td>Architectural Design Technology - Building Information Modeling (BIM) I</td>
<td>3</td>
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COURSE CODE | COURSE TITLE | UNITS
--- | --- | ---
ADT 322 | Architectural Design Technology - Building Information Modeling (BIM) II | 3
ARCH 320 | Architectural Design and Communication I | 3.5
ARCH 321 | Architectural Design and Communication II | 3.5
CMT 310 | Materials of Construction | 3

Total Units: 25

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO #1: Research, evaluate and apply energy conservation, ergonomic considerations, American Disabilities Act (ADA), ecologically sustainable design solution and principles (Green Building/LEED) to design projects.
- SLO #2: Formulate, categorize and identify Green Building/LEED certified materials and systems for use in residential and commercial projects.
- SLO #3: Organize, categorize and illustrate the development of initial models into architectural design documents, individually or through work group methods.
- SLO #4: Demonstrate, summarize and recall visual and verbal note taking methods and apply the information into models and finalized residential and commercial project designs.
- SLO #5: Assess, compose and analyze architectural graphic information effectively to create solutions from a criteria matrix, bubble diagram and block diagramming methods.
- SLO #6: Choose, assemble and distinguish the necessary skills in developing marketable BIM/CADD skills for university transfer and the job market, through measurable methods in project development and presentations.

Career Information

Architectural Draftsperson, Designer/Technician, Planning Assistant, CADD Technician, BIM Technician, Facilities/Space Planner.

Architecture Design Technology (ADT) Courses

ADT 300 Architectural Sketching and Modeling I

- Units: 3
- Hours: 36 hours LEC; 54 hours LAB
- Prerequisite: None
- Transferable: CSU
- Catalog Date: June 1, 2020

This course instructs students from the beginning level of hand sketching, instrument drawing of architectural graphic and digital modeled images. The course is designed for understanding how to draw existing structures, new structures and interior spaces, Green Building Design-Sustainability environments of Interior Building Architecture, Building Information Modeling, and Building Construction. It guides students from hand sketched graphic concepts through digital modeling in formulating project forms, and spaces. A software application, such as SketchUp® will be utilized at the end of the course as the primary tool for the development of framing plans for an introduction to ADT 302 course.

Student Learning Outcomes

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

- SLO #1: Specify specific tools and drawing conventions to complete standardized 'freehand' & 'manual' architectural drawings and sketches.
- SLO #2: Utilize the two types of freehand lettering styles utilized in Architectural drawings and sketches.
- SLO #3: Define, recognize and illustrate various line weight sizes used in architectural drawings and sketches.
- SLO #4: Compare and contrast, assemble and distinguish the necessary skills in developing marketable BIM/CADD skills for university transfer and the job market, through measurable methods in project development and presentations.
- SLO #5: Organize, categorize and illustrate the development of initial models into architectural design documents, individually or through work group methods.
- SLO #6: Demonstrate, illustrate and apply how to develop floor plan drawings, sketches and symbols.
- SLO #7: Demonstrate and apply how to letter using the expanded style of architectural lettering.
- SLO #8: Demonstrate and illustrate the difference in straight and inclined architectural lettering styles formulated in the American National Standard Alphabet.
- SLO #9: Identify the hardware & software elements of a surface, parametric, modeler and Computer-Aided Drawing/Design CADD computer workstation.
- SLO #10: Identify and describe the different kinds of computer hardware/software components and their functions.
- SLO #11: Evaluate, investigate and select the appropriate computer software application for use in the development of either a 'surface', 'parametric', or computer-aided drawing model.
- SLO #12: Appraise, select and apply the various paraline pictorial drawings used in architectural drawings and sketches.
- SLO #13: Evaluate, formalize and apply the recommended steps in producing orthographic architectural drawings and sketches.
- SLO #14: Identify and diagram two architectural types of section drawings.
- SLO #15: Contrast, assemble and compare the fundamental differences and similarities among isometric and oblique drawings and sketches.
- SLO #16: Define, identify and apply how to develop floor plan drawings, sketches and symbols.
- SLO #17: Evaluate, collect and compare methods to provide architectural interior and exterior elevations.
- SLO #18: Categorize, create and appraise the need for producing an architectural auxiliary view.
- SLO #19: Illustrate the major elements required and used to illustrate plot, site and landscape plans.
- SLO #20: Define, express and illustrate how to develop architectural drawings & sketches for landscape plans, symbols, dimensions and legends with pencil and computer models.
- SLO #21: Define, identify and illustrate topographic drawing and sketching techniques in architectural plot and site plans utilizing pencil and computer models.
Introduction to Architectural Design Technology (ADT) is a foundational course for students interested in a career within the Architecture, Engineering and Construction (AEC) industry. The course covers introductory skills needed for success in completing the ADT degree. Students will explore the role of the architectural building technologist in the AEC industry and the current best practices for use of technology in building design and construction. Upon completion of this course, students will be able to identify potential roles for employment and will be able to utilize various tools and instruments to create freehand, technical and digital drawings for communication of various types of graphics and drawings required in industry. A completed portfolio of work will be required.

Student Learning Outcomes

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

- WRITE AND SPEAK PROFESSIONALLY AND EFFECTIVELY – PROFESSIONAL COMMUNICATION SKILLS (SLO 1)
- Apply manual (sketching / drafting) and digital tools and techniques for the creation of professional documents for presentation such as sketching, drawing and modeling – professional communication skills (Objective 1A)
- COLLECT, ASSESS, RECORD, AND EVALUATE DATA IN ORDER TO SUPPORT CONCLUSIONS RELATED TO A PROJECT OR ASSIGNMENT – INVESTIGATIVE SKILLS (SLO 2)
- DEMONSTRATE EFFECTIVE USE BASIC FORMAL, ORGANIZATIONAL AND ENVIRONMENTAL PRINCIPLES TO INFORM TWO AND THREE-DIMENSIONAL DESIGN – ARCHITECTURAL DESIGN SKILLS (SLO 3)
- EXAMINE THE FUNDAMENTAL PRINCIPLES OF ARCHITECTURAL PRECEDENT AND USE IN THE DESIGN OF BUILDINGS AND URBAN DESIGN PROJECTS – USE OF PRECEDENTS (SLO 4)
- PREPARE A COMPREHENSIVE PROGRAM FOR AN ARCHITECTURAL PROJECT THAT INCLUDES ASSESSMENT OF CLIENT AND USER NEEDS, AN INVENTORY OF SPACES AND THEIR REQUIREMENTS, ANALYSIS OF SITE CONDITIONS, REVIEW OF RELEVANT BUILDING CODES AND STANDARDS, AND ASSESSMENT OF SUSTAINABILITY REQUIREMENTS – PRE DESIGN SKILLS (SLO 5)
- ANALYZE THE THEORETICAL AND APPLIED RESEARCH METHODS AND BEST PRACTICES USED DURING THE DESIGN PROCESS – RESEARCH (SLO 6)
- IDENTIFY THE KEY STAKEHOLDERS IN THE DESIGN PROCESS – CLIENT, CONTRACTOR, ARCHITECT, USER GROUPS, AND THE LOCAL COMMUNITY – STAKEHOLDER ROLES IN ARCHITECTURE (SLO 7)

ADT 302 Architectural Sketching and Modeling II

This course instructs students at an intermediate level of sketching, 3D digital design, Green Building-LEED® (Leadership in Energy and Environmental Design) principles in building design, Green Building-LEED® material certification, selection and application to models, 3D surface modeling and site development. The course is designed to facilitate further development to refining the student's design and research skills by specifying, certifying, and applying Green Building-LEED® materials and design concept principles to structures, interior architectural elements, site selection and development. A software application such as SketchUp® will be utilized as the primary software to refine and further develop detail concepts and techniques in 3D-digital modeling.

Student Learning Outcomes

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

- SLO #1: Explain the basic elements and techniques of exterior, interior and environmental site design factors.
- Research, compare, and apply energy conservation, ergonomical considerations and ecological (Green Building/Sustainable) design materials, and solutions to exterior, interior spaces and site's through sketches and drawings.
- SLO #2: Utilize manual and digital design concepts in the development of the individual interior living spaces and elements.
- Research, incorporate, and employ design considerations to develop environmental, location, architectural elements, size, and shape of exterior and interior materials of building spaces.
- SLO #3: Utilize manual and digital design concepts in the development of exterior building space elements and materials.
- Research, incorporate, and employ design considerations to develop environmentally pleasing entries, patios, cafeterias, entertaining areas, and aquatic areas.
- Estimate, formulate, and illustrate how to calculate area and volume of living and aquatic spaces.
- SLO #4: Articulate and translate the importance of calculating areas and traffic patterns for interior planning.
- Evaluate, assemble, and calculate effectiveness of traffic patterns, plan hallways, calculate the correct space needed for stairways, guidelines for entrance, foyer and lobby design.

ADT 304 Office & Commercial Space Planning

This course instructs students at the basic to intermediate level in office, commercial and residential space planning, Title 24 and general building code requirements. Concepts covered will develop skills in space programming, criteria schematics and matrices, bubble diagrams, space planning and layout, building materials, code requirements and applications to the design model.

Student Learning Outcomes

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

- SLO #1: Articulate the various historical architectural styles through illustration methods.
- Research, formulate, and catalogue architectural styles ranging from the early Greek, Roman, Middle Ages, Renaissance, Baroque, Rococo, Neoclassic, 19th Century Revival Style to the Modern period.
- SLO #2: Utilize the techniques of planning and design with Human Factors in Design principles, Green Design and Sustainable Design concepts.
- Research, examine, and illustrate design fundamentals, communication techniques, and environmental considerations in spacial design.
- SLO #3: Appraise the importance of building code design standards, the Americans with Disabilities Act, building space constraints, and specification writing.
- Diagnose, setup, and demonstrate through drawings and sketches appropriate space designs utilizing the constraints of building codes, ADA requirements, and specification documentation.
ADT 310 Architectural Computer-Aided Drawing I

This course covers the introductory study in Architectural Computer-Aided Drawing/Design with specific emphasis in the architectural field. Course subject areas will include but not be limited to identifying CADD components, working in the Windows environment, creating and saving files, entity geometry, editing features, MLine 'Styles', Layer convention properties, text/font 'Styles', layering creation, dimensioning and dimension 'Styles', Model and Paper Space environments, plotting, and Plot 'Styles'. The subject content will cover the development of architectural floor plans, foundation plans & foundation 'details', electrical plans, subdivision plans and others drawings as they relate to the architectural field of study. Students will learn how to develop professional architectural drawing file documentation through the preparation and plotting (printing) presentation.

Student Learning Outcomes
Upon completion of this course, the student will be able to:

- SLO #1; Appraise the importance of basic digital drawing preparation and development.
- SLO #2; Demonstrate how to properly use Editing and Viewing functions within CAD software.
- SLO #3; Articulate the use of Drawing and Editing tools in drawing development.
- SLO #4; Utilize the basic functions in the development of Dimensioning Styles and formats for Architectural Drawings.
- SLO #5; Utilize specific methods in Paper Space to develop proper plotting documents.
- SLO #6; Demonstrate how to create and manage drawings.
- SLO #7; Utilize specific methods in Paper Space to develop proper plotting documents.

ADT 314 Architectural 3D Modeling

This course covers the introduction to 3-dimensional modeling and rendering for building structures and spatial analysis studies, Green Building/LEED® (Leadership in Energy and Environmental Design) material and guidelines application. Course subject areas will include shapes, splines, meshes, light, shadows, models, materials, scene creation, animations, and creating exterior and interior architectural objects with software such as 3ds Max Design®.

Student Learning Outcomes
Upon completion of this course, the student will be able to:

- SLO #1; Utilize shape and primitive elements in the development of conceptual 3D architectural models and rendered images.
- SLO #2; Articulate through the development and use of element objects in 3D architectural models.
- SLO #3; Articulate through the organization and management of architectural objects and scene creation.
- SLO #4; Utilize interior and exterior models in the creation of rendered animations.
- SLO #5; Utilize specific methods in Paper Space to develop proper plotting documents.

ADT 320 Architectural Design Technology - Building Information Modeling (BIM)

This course instructs students in the beginning level of Building Information Modeling as it relates to parametric building modeling for architectural interiors and building space using software such as AutoDesk's Revit® Architecture. The content is a first level introduction course to data-generated Parametric Building Modeling for architectural design and drawing, also known as Building Information Modeling (BIM). Professionals in the design/construction field may have work and/or academic experience to waive any pre-requisites.

Student Learning Outcomes
Upon completion of this course, the student will be able to:

- SLO #1: Explain the basis and orientation to the Building Information Management (BIM) technology.
- Organize, survey, and define the Autodesk Revit® user interface screen.
- SLO #2: Utilize the element tools using basic building components and editing tools.
- Generate, analyze, and exhibit how to create elements such as walls, doors, windows, and surface materials within the parametric model.
- Appraise, manage, and convert existing elements by utilizing many of the editing tools within the parametric model.
- SLO 3#: Articulate how to work with datum's and create standard model views with the project browser.
- Choose, build, and develop standard concept levels for buildings, models and spaces.
- Choose, build, and develop standard architectural grids for the project files.
- Arrange, apply, and define transverse and longitudinal sections with work plane and reference plane tools.
- SLO #4: Utilize the intermediate building components in developing specific levels of space in a parametric model.
- Choose, manage, and apply specific locations and materials to floors, ceilings and creating roof types and material applications.
- SLO #5: Utilize the massing tool in developing initial/preliminary architectural exterior and spatial designs for review.
- Appraise, contrive, and examine through the use of the massing tool initial build/space designs before converting to building elements.
- Generate, analyze and exhibit how to use 'Create-In-Place' (CIP) tools.

ADT 322 Architectural Design Technology - Building Information Modeling (BIM) II

**Units:** 3  
**Hours:** 36 hours LEC; 54 hours LAB  
**Prerequisites:** ADT 320, or skills equivalent to ADT 320 with proficiency determined by the instructor.  
**Transferable:** CSU  
**Catalog Date:** June 1, 2020

This course instructs students to the intermediate level of parametric modeling and management of architectural interiors and exteriors, building space management/design using software such as Autodesk's Revit®. The content is a second level course introduction to data-generated parametric building modeling 'document drawing', also known as Building Information Management that surpasses pencil and CADD generated architectural drawings.

**Student Learning Outcomes**

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

- SLO #1: Explain the intermediate features of line weights and wall types applied to models.
- Build, categorize, and demonstrate how to create coarse, medium, and fine wall types.
- Build, categorize, and apply specific numerical line weight properties to models.
- SLO #2: Utilize the 16 intermediate editing tools available in the edit tool bar for modifying architectural models.
- Define, identify, and apply the various editing tools for modifying a parametric model.
- SLO #3: Utilize the automated intermediate components in the development of architectural models.
- Examine, formulate, and choose the various 'Automated' component tools available to create roofs, stairs, ceilings, wall systems, curtain walls and systems and railings.
- SLO #4: Appraise the importance of applying site features to architectural models.
- Define, express, and sketch topographic surface models, inserting site components for merging into architectural models.
- SLO #5: Articulate through illustration the importance of creating animated 'renderings' and 'walk-throughs' for interior/exterior architectural models.
- Compose, apply, and simulate through a realistic walk-through how interiors/exteriors will appear in a photo realistic appearance.

ADT 324 Architectural Design Technology - Building Information Modeling (BIM) III

**Units:** 3  
**Hours:** 36 hours LEC; 54 hours LAB  
**Prerequisites:** ADT 322 with a grade of "C" or better; or skills equivalent to ADT 322 with proficiency determined by the instructor.  
**Transferable:** CSU  
**Catalog Date:** June 1, 2020

This course instructs students in the intermediate level of Building Information Modeling as it relates to parametric modeling and Green Building/LEED® (Leadership in Energy and Environmental Design) for 'Building Systems' drawing and design using software such as Autodesk's Revit® MEP. The content is a first level introduction course of data-generated Parametric Building Modeling software for Mechanical, Electrical, and Plumbing systems; illustrating how the MEP (Mechanical-Electrical-Plumbing) software drawing designs integrate with Revit® Architecture and/or Revit® Structure.

**Student Learning Outcomes**

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

- SLO #1: Specify what Building Information Modeling (BIM) methodology means.  
- Identify and illustrate two written or verbal examples defining Building Information Modeling.  
- SLO #2: Indicate the location of various tools from the ribbon tabs, and panels.  
- Identify, explain, and use the Revit® MEP user interface and ribbon framework.  
- SLO #3: Specify the recommended practices for working with Revit® 'elements' and 'families'.  
- Assemble and demonstrate the necessary steps in using heating-cooling 'elements' and developing 'families'.  
- SLO #4: Examine the practices for creating and working with 'views' and 'view templates'.  
- Assemble and produce the steps necessary in creating perspective 'view's and developing 'view templates'.  
- SLO #5: Determine the best practices to create and modify 3D perspective and 2D orthographic views of a model.
• Examine, manipulate, and illustrate the steps to create 3D perspective and 2D orthographic views of heating-cooling views.

• SLO #6: Examine the process of shared projects using worksets, and import/edit AutoCAD drawing details into Revit®.

• Assemble, set-up, and formulate how to create Central and Local files for design team design.

• SLO #7: Examine the process of developing identity data and Heating Ventilating Air Conditioning system zones.

• Formulate, set-up and sketch the identity of elements, tags with data and creating HVAC zones.

• SLO #8: Determine the best practices in setting up analytical models and HVAC loads.

• Demonstrate, summarize, and apply the steps in viewing analytical models and work with heating and cooling loads.

• SLO #9: Diagram methods for creating and modifying HVAC systems and auxiliary support systems.

• Identify and diagram how to create, generate, and modify HVAC systems, layouts and ductwork.

• SLO #10: Diagram methods for creating fire, plumbing suppression and electrical system.

• Identify and diagram how to create and generate piping, plumbing, fire protection, and electrical systems.

• SLO #11: Examine the various principles of project monitoring.

• Formulate, exhibit, and demonstrate how to monitor, check and fix interference conditions in the model.

• SLO #12: Determine the various methods labeling and schedule development.

• Assemble, set-up, and tabulate methods on how to create labeling and various schedules within the model.

ADT 326 Architectural Design Technology - Building Information Modeling (BIM) IV

| Units: | 3 |
| Hours: | 36 hours LEC; 54 hours LAB |
| Prerequisite: | ADT 310 and 320; Students' knowledge and/or skills may be evaluated by the instructor on an individual basis, in lieu of the two Advisory Courses listed. |
| Advisory: | None. |
| Transferable: | CSU |
| Catalog Date: | June 1, 2020 |

This course instructs students in the intermediate level of Building Information Modeling as it relates to parametric modeling and Green Building/LEED® (Leadership in Energy and Environmental Design) guidelines for structural drawing and design using software such as AutoDesk's Revit® Structure. The content is a first level introduction course of data-generated Parametric Building Modeling software for Structures, illustrating how the Structure software drawing designs integrate with Revit® Architecture and/or Revit® MEP.

Student Learning Outcomes

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

• SLO #1: Describe building information methodology.

• Identify and illustrate two written or verbal examples defining Building Information Modeling.

• SLO #2: Use the Revit® Structure user interface and work with different types of structural 'elements' and 'families'.

• Assemble and demonstrate the necessary steps in how to use structural 'elements' and developing 'families' from the user interface.

• SLO #3: Understand how to work with the Project Browser, how to control object visibility and graphical representation, and work the elevation, section, and 3D view.

• Evaluate, formulate, and illustrate the use of Visibility Graphics methods and Project Browser to modify various views within a project.

• SLO #4: Determine initial level and grid patterns of structural layouts.

• Evaluate, organize, and determine how to establish a project layout, transfer project standards, and work with levels and grids in a structural model.

• SLO #5: Specify specific tools and drawing conventions to establish structural building systems.

• Design, calculate, and apply methods to create structural columns and structural walls, create new wall types, and work with foundations, pilasters, and elevator pits.

• SLO #6: Specify specific tools to edit structural building systems.

• Resolve, examine, and employ methods for modifying beams and beam systems, add and edit structural steel moment and braced frames.

• SLO #7: Create slabs and roofs, and add structural framing to roofs for support.

• Assess, draft, and sketch methods to create overhead structural, and structural wall systems.

• SLO #8: Add foundations to a structural model.

• Diagnose, calculate, and employ drawing methods for the design of foundation floors, walls, and footer systems.

• SLO #9: Create structural stairs and various types of interior and exterior ramps to building structures.

• Diagnose, calculate, and employ drawing methods for design of structural stairs and ramps.

• SLO #10: Developing Annotation and Annotation standards in structural drawing views.

• Appraise, create, and illustrate how to work with plan annotations using tags, dimensions, spot dimensions, and text as well as creating legends, annotation symbols, and schedules.

• SLO #11: Illustrate how to Import and Export various 2D Revit® and AutoCad file formats in drawings and views.

• Create and use detailing components and also import and use DWG™ details in your models.

• SLO #12: Specify the methods for developing printed format in Revit® and AutoCad.

• Recommend, formulate, and employ techniques for construction documentation, working with sheets and title-blocks, print a sheet set, and export Revit® Structure content to CAD™ formats.

ADT 495 Independent Studies in Architectural Design Technology

| Units: | 1 - 3 |
| Hours: | 54 - 162 hours LAB |
| Prerequisite: | None. |
| Transferable: | CSU |
| Catalog Date: | June 1, 2020 |

An independent studies project involves an individual student or small group of students in study, research, or activities beyond the scope of regularly offered courses. See the current catalog section of "Special Studies" for full details of Independent Studies.

Student Learning Outcomes
Upon completion of this course, the student will be able to:

- SLO #1: Actively engage in intellectual inquiry beyond that required in order to pass a course of study (College Wide Learning Outcome – Area 4).
- Discuss and outline a proposal of study (that can be accomplished individually or by collaboration of a small group) to foster special knowledge, skills, and experience that are not available in any one regularly scheduled course.
- Use information resources to gather discipline-specific information.
- SLO #2: Utilize modes of analysis and critical thinking to apply theoretical perspectives and/or concepts in the major discipline of study to significant problems and/or educational activities (College Wide Learning Outcome – Area 3).
- Analyze and apply the knowledge, skills and experience that are involved in the independent study to theoretical perspectives and/or concepts in the major discipline of study.
- Explain the importance of the major discipline of study in the broader picture of society.
- SLO #3: Communicate a complex understanding of content matter of the major discipline of study (College Wide Outcome – Area 3).
- Demonstrate competence in the skills essential to mastery of the major discipline of study that are necessary to accomplish the independent study.
- SLO #4: Identify personal goals and pursue these goals effectively (College Wide Outcome – Area 4).
- Utilize skills from the "academic tool kit" including time management, study skills, etc., to accomplish the independent study within one semester term.

ADT 498 Work Experience in Architecture Design Technology

| Units: | 1 - 4 |
| Hours: | 60 - 300 hours LAB |
| Prerequisite: | None. |
| Enrollment Limitation: | Students must be in a paid or unpaid internship, volunteer position or job related to career goals in Architecture Design Technology. |
| Transferable: | CSU |
| General Education: | AA/AS Area II(b) |
| Catalog Date: | June 1, 2020 |

This course provides students with opportunities to develop marketable skills in preparation for employment in their major field of study or advancement within their career. It is designed for students interested in work experience and/or internships in transfer level degree occupational programs. Course content includes understanding the application of education to the workforce; completion of required forms which document the student's progress and hours spent at the work site; and developing workplace skills and competencies. Appropriate level learning objectives are established by the student and the employer. During the semester, the student is required to participate in a weekly orientation and 75 hours of related paid work experience, or 60 hours of unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. Work Experience may be taken for a total of 16 units when there are new or expanded learning objectives. Only one Work Experience course may be taken per semester.

Student Learning Outcomes

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

- DEMONSTRATE AN UNDERSTANDING AND APPLICATION OF PROFESSIONAL WORKPLACE BEHAVIOR IN A FIELD OF STUDY RELATED TO ONE’S CAREER (SLO 1)
  - Understand the effects time, stress, and organizational management have on performance.
  - Demonstrate an understanding of consistently practicing ethics and confidentiality in a workplace.
  - Examine the career/life planning process and relate its relevancy to the student.
  - Demonstrate an understanding of basic communication tools and their appropriate use.
  - Demonstrate an understanding of workplace etiquette.
  - DESCRIBE THE CAREER/LIFE PLANNING PROCESS AND RELATE ITS RELEVANCY TO ONE’S CAREER (SLO 2)
    - Link personal goals to long term achievement.
    - Display an understanding of creating a professional first impression.
    - Understand how networking is a powerful job search tool.
    - Understand necessary elements of a résumé.
    - Understand the importance of interview preparation.
    - Identify how continual learning increases career success.
  - DEMONSTRATE APPLICATION OF INDUSTRY KNOWLEDGE AND THEORETICAL CONCEPTS AS WRITTEN IN LEARNING OBJECTIVES IN PARTNERSHIP WITH THE EMPLOYER WORK SITE SUPERVISOR (SLO 3)

ADT 499 Experimental Offering in Architecture Design Technology

| Units: | 0.5 - 4 |
| Prerequisite: | None. |
| Transferable: | CSU |
| Catalog Date: | June 1, 2020 |

Faculty

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