

Architecture

Overview

This program offers students study and job-related experience in architectural drafting, construction techniques, design, rendering, and energy systems as well as opportunities to develop skills necessary for employment in the professional field of architecture. Transfer programs are articulated with California State Polytechnic University at San Luis Obispo, the University of California at Berkeley, and New School of Architecture and Design.

Program Maps

[Architecture, A.S. Degree \(/crc/main/doc/programs/program-maps/arch-as-degree-ho.pdf\)](/crc/main/doc/programs/program-maps/arch-as-degree-ho.pdf)

[Architecture, Architectural Technology, Certificate of Achievement \(/crc/main/doc/programs/program-maps/arch-tech-cert-ho.pdf\)](/crc/main/doc/programs/program-maps/arch-tech-cert-ho.pdf)

[Green Buildings: Environmental Design, Energy Management and Performance \(/crc/main/doc/programs/program-maps/green-buildings-cert-ho.pdf\)](/crc/main/doc/programs/program-maps/green-buildings-cert-ho.pdf)

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Associate Degree

A.S. in Architecture

The objective of this program is to develop design and job-related skills necessary for entry into the professional field of architecture. The curriculum focuses on development of critical thinking and problem solving abilities as a means to creative thinking. College preparation for a career in architecture spans several disciplines and includes the development of knowledge and competencies in areas such as: architectural history and design; visual communication and drawing; computer modeling and rendering; construction methods and materials; energy systems and an understanding of human needs and sociology as they relate to the built environment.

HIGHLIGHTS

- *Participation in architecturally-related events such as the Design Village Competition at Cal Poly San Luis Obispo.
- *Field trips to a variety of architectural sites for study and appreciation of the built environment.
- *Special studies in environmental sustainability and energy conscious design.
- *Liaison with professional organizations such as the American Institute of Architects (AIA) and the Construction Specification Institute (CSI).

Catalog Date: January 1, 2021

Degree Requirements

COURSE CODE	COURSE TITLE	UNITS
ARCH 300	Introduction to Design Professions	2
ARCH 310	History of Architecture	3
ARCH 320	Architectural Design and Communication I	3.5
ARCH 321	Architectural Design and Communication II	3.5
ARCH 322	Architectural Design and Communication III	3.5
ARCH 325	Architectural Digital Design and Communication I	3
ARCH 326	Architectural Digital Design and Communication II	3
ARCH 329	Architectural Working Drawings	4
ARCH 330	Design Fundamentals	3.5
ARCH 332	Design Awareness	3
ARCH 334	Advanced Design in Three Dimensions	3
ARCH 342	Introduction to Green Buildings	3
CMT 310	Materials of Construction	3
Total Units:		41

The 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:

- PSLO #1: Have the necessary technical knowledge and reasoning skills to identify, articulate, record information, assess evidence, investigate precedents and solve problems pertaining to the built environment and perform the tasks required within the architecture and environmental design professions. This includes the ability to use basic formal organizational and environmental principles; build abstract relationships to inform two and three-dimensional design; and understand the impact of ideas based on research, analysis of multiple theoretical, social, political, economic, cultural and environmental contexts.
- PSLO #2: Have the necessary communication skills, using a diverse range of techniques and media to think about and convey architectural ideas including writing; analytical and envisioning drawing; speaking to peers and groups; computer modeling and physical model-making.
- PSLO #3: Be able to comprehend the technical aspects of design, systems, sustainability, constructability, and materials, and be able to apply this comprehension to architectural solutions. This includes: 1. Site Design: Ability to respond to site determinants such as context and planning issues in the development of a project design. 2. Life Safety: Ability to apply basic principles of life-safety systems and exiting. 3. Environmental Systems: Understanding the principles of environmental control systems and sustainable design. 4. Structural Systems: Understanding the basic principles of structural behavior in withstanding gravity and lateral loads and the appropriate structural alternatives. 5. Building Envelope Systems: Understanding of the basic principles of building materials and characteristics in the appropriate selection relative to performance, aesthetics, moisture control, energy and durability.
- PSLO #4: Have the values of ethics and understanding of historical, cultural, human, aesthetic, environmental, public health and social issues to be able to affect creative change. This includes understanding the diverse needs, values, behavioral norms, physical abilities, social and spatial patterns that characterize different cultures and individuals.
- PSLO #5: Be able to work effectively as a team member or as an individual.
- PSLO #6: Have the professional attitude and desire for life-long learning. This includes developing habits of research, precedent, and independent learning.

Career Information

Architecture; Building Information Modeler; Inspection; Planning; Construction Administration. Some career options may require more than two years of college study. Classes beyond the associate degree may be required to fulfill some career options or for preparation for transfer to a university program.

Certificates of Achievement

Architectural Technology Certificate

The objective of this certificate is to develop design and job-related skills necessary for entry into the professional field of architecture. The curriculum focuses on development of critical thinking and problem solving abilities as a means to creative thinking. College preparation for a career in architecture spans several disciplines and includes the development of knowledge and competencies in areas such as: architectural design; visual communication and drawing; computer modeling and rendering; construction methods and materials; energy systems and an understanding of human needs and sociology as they relate to the built environment.

Catalog Date: January 1, 2021

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
ARCH 300	Introduction to Design Professions	2
ARCH 320	Architectural Design and Communication I	3.5
ARCH 321	Architectural Design and Communication II	3.5
ARCH 322	Architectural Design and Communication III	3.5
ARCH 325	Architectural Digital Design and Communication I	3
ARCH 326	Architectural Digital Design and Communication II	3
ARCH 329	Architectural Working Drawings	4
ARCH 330	Design Fundamentals	3.5
ARCH 332	Design Awareness	3
ARCH 334	Advanced Design in Three Dimensions	3
ARCH 342	Introduction to Green Buildings	3
CMT 310	Materials of Construction	3
Total Units:		38

Student Learning Outcomes

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

- PSLO #1: Have the necessary technical knowledge and reasoning skills to identify, articulate, record information, assess evidence, investigate precedents and solve problems pertaining to the built environment and perform the tasks required within the architecture and environmental design professions. This includes the ability to use basic formal organizational and environmental principles; build abstract relationships to inform two and three-dimensional design; and understand the impact of ideas based on research, analysis of multiple theoretical, social, political, economic, cultural and environmental contexts.
- PSLO #2: Have the necessary communication skills, using a diverse range of techniques and media to think about and convey architectural ideas including writing; analytical and envisioning drawing; speaking to peers and groups; computer modeling and physical model-making.
- PSLO #3: Be able to comprehend the technical aspects of design, systems, sustainability, constructability, and materials, and be able to apply this comprehension to architectural solutions. This includes: 1. Site Design: Ability to respond to site determinants such as context and planning issues in the development of a project design. 2. Life Safety: Ability to apply basic principles of life-safety systems and exiting. 3. Environmental Systems: Understanding the principles of environmental control systems and sustainable design. 4. Structural Systems: Understanding the basic principles of structural behavior in withstanding gravity and lateral loads and the appropriate structural alternatives. 5. Building Envelope Systems: Understanding of the basic principles of building materials and characteristics in the appropriate selection relative to performance, aesthetics, moisture control, energy and durability.
- PSLO #4: Have the values of ethics and understanding of historical, cultural, human, aesthetic, environmental, public health and social issues to be able to affect creative change. This includes understanding the diverse needs, values, behavioral norms, physical abilities, social and spatial patterns that characterize different cultures and individuals.
- PSLO #5: Be able to work effectively as a team member or as an individual.

- PSLO #6: Have the professional attitude and desire for life-long learning. This includes developing habits of research, precedent, and independent learning.

Career Information

Architecture; Building Information Modeler; Inspection; Planning; Construction Administration. Some career options may require more than an Architectural Technology certificate. Classes beyond the associate degree may be required to fulfill some career options or for preparation for transfer to a university program.

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: January 1, 2021

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
ARCH 342	Introduction to Green Buildings	3
CMT 310	Materials of Construction	3
A minimum of 12 units from the following:		12
ARCH 332	Design Awareness (3)	
ARCH 334	Advanced Design in Three Dimensions (3)	
ADT 320	Architectural Design Technology - Building Information Modeling (BIM) I (3)	
ADT 322	Architectural Design Technology - Building Information Modeling (BIM) II (3)	
BIT 150	California Energy Code – Building Energy Efficiency Standards (3)	
CONST 143	Photovoltaic Systems (3)	
ECON 306	Environmental Economics (3)	
GEOG 302	Environmental Studies & Sustainability (3)	
GEOG 305	Global Climate Change (3)	
GEOG 306	Weather and Climate (3)	
Total Units:		18

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.

Architecture (ARCH) Courses

ARCH 300 Introduction to Design Professions

Units:	2
Hours:	36 hours LEC
Prerequisite:	None.
Transferable:	CSU; UC
Catalog Date:	January 1, 2021

This course is a comprehensive study of the professions related to the built environment including architecture, landscape architecture, construction management, construction, city and urban planning, interior design, building inspection, environmental and energy planning. Guest speakers from various design and construction professions will engage students in discussions related to their professional practice and the necessary preparation in education and experience. Each student will evaluate his/her interest and potential of success in the areas of his/her choice. The course will include an overview of architectural history, an introduction to some of the major architects and class discussion of current issues in the environmental design professions. Additional topics in the class will include: transfer, licensing requirements and environmental design vocabulary.

Student Learning Outcomes

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

- SLO-1: Demonstrate basic abilities at using problem solving and design process methodologies to identify problems, analyze criteria and apply learned principles to synthesize solutions to specific design projects.
- Evaluate and reflect on the success of the process and the solution for a specific design project.
- SLO-2: Utilize skill associated with representing ideas and thinking visually, orally and by writing.
- SLO-3: Identify needs and assume diverse roles that maximize individual talents and to cooperate with other students, when working as a team, to maximize accomplishment.
- Show ability at active participation and contribution both as an individual and in team efforts.
- SLO-4: Demonstrate ability at research, investigation and the skills associated with life-long learning.
- Utilize comprehensive and graphic visual note-making in sketch books for recording of thoughts, observations, design thinking, and to enhance the desire for research, independent learning and continuing education as a life-long pursuit.
- SLO-5: Identify, assess and reflect on the values of historical, cultural, human, aesthetic, environmental and social issues in effecting creative change to the built environment.
- SLO-6: Identify, assess and reflect on the issues related to choosing an environmental design profession and determine for themselves their interest, placement and occupational pursuit.
- Recognize the differences in the various environmental design professions and apply learned information and principles to make rational and fulfilling education and career decisions.
- Outline the requirements for matriculation to CRC transfer schools in order to gain acceptance.
- Describe the work place requirements of the environmental design professions for successful completion of career goals.

ARCH 310 History of Architecture

Units:	3
Hours:	54 hours LEC
Prerequisite:	None.
Advisory:	Eligibility for ENGWR 101
Transferable:	CSU; UC
General Education:	AA/AS Area I; CSU Area C1
Catalog Date:	January 1, 2021

This course studies the architecture design theories and practices of the late 19th and 20th century to the present including the Beaux Arts, Art Nouveau, Expressionism, De Stijl international style, Fascist Ideologies, Regionism, Post World War II Amalgamations of Twentieth Century idioms and recent reactions to contemporary standardization.

Student Learning Outcomes

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

- SLO-1: Understand and demonstrate how historical issues have been able to influence and affect creative change and evolution in the character of the built environment.
- Identify, understand and demonstrate the relationship of development of the built environment to changes in fine art, technological development, structural innovation, cultural influences, aesthetic concepts, sociological psychology, architectural theory, context, resources, environment, etc.
- To identify buildings that have been significant milestones in the evolution of the built environment, place them in their historical timeframe, identify what is the architectural and historical significance of the building.
- SLO-2: Demonstrate ability to identify and assume diverse roles that maximize individual talents and to cooperate with other students, when working as a team, to maximize accomplishment.
- To demonstrate ability at active participation and contribution both as an individual and in team efforts.
- SLO-3: To demonstrate ability at research, investigation and the skills associated with life-long learning.
- To demonstrate ability to use comprehensive and graphic visual note-making in sketch books for recording of thoughts, observations, design thinking, and to enhance the desire for research, independent learning and continuing education as a life-long pursuit.

ARCH 320 Architectural Design and Communication I

Units:	3.5
Hours:	54 hours LEC; 27 hours LAB
Prerequisite:	None.
Corequisite:	ARCH 325
Transferable:	CSU; UC
Catalog Date:	January 1, 2021

This course is an introduction to the concepts and processes associated with two and three-dimensional design. A series of design projects are used to discover principles and concepts of design while simultaneously addressing the skills associated with representing envisioned ideas, objects and environments. This includes the development of freehand sketching, manual drafting and graphic skills for communication of analysis and design concepts. Students should previously or concurrently enroll in ARCH 325 to learn methods for digital construction of design and drawing projects assigned in ARCH 320.

Student Learning Outcomes

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

- SLO-1: Apply basic organizational and spatial principles in the conception and development of architectural environments.
- Utilize problem solving and design process methodologies to identify problems, analyze criteria and apply learned principles to synthesize solutions to specific design projects; to assess and reflect on the success of the process and solution.
- Use the fundamentals of visual perception and the principles of order (unity, balance, pattern, hierarchy, etc.) to create relationships between elements.
- Demonstrate understanding and ability at using a range of architectural design concepts including the sequential experiences of approach, entry, arrival, open/implied versus closed/explicit space, clear spatial figure, etc.
- SLO-2: Understand and utilize the skills associated with representing envisioned ideas, objects and environments.
- Employ appropriate drawing and representational media, including computer and duplication technology, to convey essential formal elements at each stage of the programming and design process.
- Understand and apply information gathered by the human visual system to support the perception of form and space (spatial cues as well as the graphic language of texture, value, line weight etc).
- Define the role of different types of drawing in the communication of design ideas at the various stages of a project and to be able to use the primary drawing systems of orthographics, para-line and perspective to represent those ideas.
- Utilize a range of drawing types from quick freehand gestures to carefully constructed representations to represent existing and imagined objects or environments on two-dimensional surfaces.
- Create the context of figures, landscape, and furnishings into various drawing systems with appropriate scale to enhance the representation of depth.
- Produce hand lettering using a range of media (i.e. pencil, pen, and marker) that exhibits good letter form, consistency, alignment and shape.
- SLO-3: Identify and assume diverse roles that maximize individual talents and to cooperate with other students, when working as members of a team, to maximize accomplishment.
- Demonstrate ability at active participation and contribution to a team effort.
- SLO-4: Demonstrate ability at research, investigation and the skills associated with life-long learning.
- Use comprehensive and graphic visual note-making in sketch books for recording of thoughts, observations, design thinking and to enhance the desire for research, independent learning and continuing education as a life-long pursuit.

ARCH 321 Architectural Design and Communication II

Units:	3.5
Hours:	54 hours LEC; 27 hours LAB
Prerequisite:	None.
Corequisite:	ARCH 326
Advisory:	It is advisable that students enrolling in this course should have completed Arch 320 and 325 or a computer modeling course, in order to have abilities at computer modeling and to understand basic drawing types of orthographic, paraline and perspective.
Transferable:	CSU; UC
Catalog Date:	January 1, 2021

This course is a continuation and development of the content and issues introduced in ARCH 320 plus the principles, concepts, methods and skills pertaining to the construction of shadows and reflections, physical model building, entourage and color theory. A series of design projects are used to discover principles and concepts of design while simultaneously addressing the skills associated with representing envisioned ideas, objects and environments. This includes the development of physical model making, freehand sketching, manual drafting and graphic skills for communication of analysis and design concepts. Students should previously or concurrently enroll in ARCH 326 to learn methods for digital construction of design and drawing projects assigned in ARCH 321.

Student Learning Outcomes

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

- SLO-1: Apply basic organizational and spatial principles to the conception and development of architectural environments.
- Utilize problem solving and design process methodologies to identify problems, analyze criteria and apply learned principles to synthesize solutions to specific design projects; to assess and reflect on the success of the process and solution.
- Use the fundamentals of visual perception and the principles of order (unity, balance, pattern, hierarchy, etc.) to create relationships between elements.
- Demonstrate understanding and ability at using a range of architectural design concepts including the sequential experiences of approach, entry, arrival, continuum, open/implied versus closed/explicit space, clear spatial figure, etc. to respond to discovered issues related to context, image and function.
- SLO-2: Understand and utilize the skills associated with representing envisioned ideas, objects and environments.
- Employ appropriate drawing and representational media, including computer and duplication technology, to convey essential formal elements at each stage of the programming and design process.
- Understand and apply information gathered by the human visual system to support the perception of form and space (spatial cues as well as the graphic language of color, texture, light, shade, shadow, reflectivity, line weight etc).
- Define the role of different drawing and model types in the communication of design ideas at the various stages of a project and to be able to use the primary drawing systems of orthographics, para-line and perspective as well as physical models to represent those ideas.
- Utilize a range of drawing types from quick freehand gestures to carefully constructed representations to represent existing and imagined objects or environments on two-dimensional surfaces.
- Create the context of figures, landscape, and furnishings into various drawing systems with appropriate scale to enhance the representation of depth.
- Produce hand lettering using a range of media (i.e. pencil, pen, and marker) that exhibits good letter form, consistency, alignment and shape.
- SLO-3: Identify and assume diverse roles that maximize individual talents and to cooperate with other students, when working as members of a team, to maximize accomplishment.
- To demonstrate ability at active participation and contribution to a team effort.
- SLO-4: To demonstrate ability at research, investigation and the skills associated with life-long learning.
- Use comprehensive and graphic visual note-making in sketch books for recording of thoughts, observations, design thinking and to enhance the desire for research, independent learning and continuing education as a life-long pursuit.

ARCH 322 Architectural Design and Communication III

Units:	3.5
Hours:	54 hours LEC; 27 hours LAB
Prerequisite:	None.
Advisory:	It is advisable that students enrolling in this course should have completed Arch 320 or Arch 321 in order to have abilities at design, computer modeling and to understand basic drawing types of orthographic, paraline and perspective.
Transferable:	CSU
Catalog Date:	January 1, 2021

This course is a continuation and development of the content and issues introduced in ARCH 320 and 321 plus the issues, concepts, processes and skills pertaining to the analysis and design of architectural form, space and organizations. A series of design projects are used to discover principles and concepts of design while simultaneously addressing the skills associated with representing envisioned ideas, objects and environments. This includes the development of freehand sketching, computer modeling, architectural delineation and graphic skills for communication of analysis and design concepts.

Student Learning Outcomes

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

- SLO-1: Apply basic organizational and spatial principles to the conception and development of architectural environments.
- Utilize problem solving and design process methodologies to identify problems, analyze criteria and apply learned principles to synthesize solutions to specific design projects; to assess and reflect on the success of the process and solution. Students should be able to analyze issues related to image, function and context in order to develop appropriate conceptual responses.
- Use the fundamentals of visual perception and the principles of order (unity, balance, pattern, hierarchy, etc.) to create relationships between elements.
- Analyze the work of precedent architects to understand the formal techniques of expressing philosophy and meaning. Demonstrate understanding and ability at using a range of learned architectural design concepts and geometry including the sequential experiences of approach, entry, arrival, continuum, open/implied versus closed/explicit space, clear spatial figure, etc. to respond to discovered issues related to context, image and function.
- SLO-2: Understand and utilize the skills associated with representing envisioned ideas, objects and environments.
- Employ appropriate drawing and representational media, including computer and duplication technology, to convey essential formal elements at each stage of the programming and design process.
- Understand and apply information gathered by the human visual system to support the perception of form and space (spatial cues as well as the graphic language of color, texture, light, shade, shadow, reflectivity, line weight etc).
- Define the role of different drawing and model types in the communication of design ideas at the various stages of a project and to be able to use the primary drawing systems of orthographics, para-line and perspective.
- Utilize a range of drawing types from quick freehand gestures to carefully constructed and rendered delineations to represent existing and imagined objects or environments on two-dimensional surfaces.
- Create the context of figures, landscape, and furnishings into various drawing systems with appropriate scale to enhance the representation of depth.
- Produce hand lettering using a range of media (i.e. pencil, pen, and marker) that exhibits good letter form, consistency, alignment and shape.
- SLO-3: Identify and assume diverse roles that maximize individual talents and to cooperate with other students, when working as members of a team, to maximize accomplishment.
- Demonstrate ability at active participation and contribution to a team effort.
- SLO-4: Demonstrate ability at research, investigation and the skills associated with life-long learning.
- Use comprehensive and graphic visual note-making in sketch books for recording of thoughts, observations, design thinking and to enhance the desire for research, independent learning and continuing education as a life-long pursuit.

ARCH 325 Architectural Digital Design and Communication I

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	None.
Corequisite:	ARCH 320
Transferable:	CSU
Catalog Date:	January 1, 2021

This is a studio course to explore principles, concepts, methods and skills pertaining to the digital construction of drawings employing orthographic, axonometric, oblique, and lineal perspective drawing systems to represent ideas, objects and environments.

Student Learning Outcomes

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

- SLO-1: Demonstrate technical knowledge of a range of digital media and techniques that can be employed in drawing and other visual communications.
- Create a range of two-dimensional reproduction techniques (i.e. prints, photocopies, statistics, scans, etc.).
- Use a range of presentation methods including computer images.
- Use a range of computer hardware components and software applications and understand the function and relationship of the major hardware components of a typical stand-alone computer system; explain the relationship between the hardware and software of computer systems; describe the function and relationship of operation systems, shell applications and special purpose applications.
- SLO-2: Utilize problem solving methodologies to identify problems and issues, to apply learned principles to synthesize solutions to specific 2d and 3d design problems assigned in Arch 320 and to assess and reflect on the success of the process and solution.
- SLO-3: Demonstrate ability at research, investigation and the skills associated with life-long learning.
- Use comprehensive and graphic visual note-making in sketch books for recording of thoughts, observations, design thinking and to enhance the desire for research, independent learning and continuing education as a life-long pursuit.

ARCH 326 Architectural Digital Design and Communication II

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	None.
Corequisite:	ARCH 321
Transferable:	CSU
Catalog Date:	January 1, 2021

This course is a continuation and development of the content and issues introduced in ARCH 325, plus the principles, concepts, methods and skills pertaining to the digital construction of shadows, digital and physical model building, entourage and color theory.

Student Learning Outcomes

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

- SLO-1: Demonstrate technical knowledge of a range of digital media and techniques that can be employed in drawing and other visual communications.
- create a range of two-dimensional reproduction techniques (i.e. prints, photocopies, statistics, scans, etc.).
- use a range of presentation methods including computer images.
- use a range of computer hardware components and software applications to understand the function and relationship of the major hardware components of a typical stand-alone computer system.
- explain the relationship between the hardware and software of computer systems.
- describe the function and relationship of operation systems, shell applications and special purpose applications.
- SLO-2: Demonstrate ability at using problem solving methodologies to identify problems and issues to apply learned principles to synthesize solutions to specific 2d and 3d design problems.
- assess and reflect on the success of the process to synthesize solutions to specific 2d and 3d design problems.
- SLO-3: To demonstrate ability at research, investigation and the skills associated with life-long learning.
- demonstrate ability to use comprehensive and graphic visual note-making in sketch books for recording of thoughts and observations for design thinking.

ARCH 329 Architectural Working Drawings

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.
Advisory:	It is advised that students taking this have completed a Building Information Modeling (BIM) course or have completed Arch 321 and Arch 326.
Transferable:	CSU
Catalog Date:	January 1, 2021

This course provides an introduction to residential design and construction documents. Students will design a residence and produce a complete set of architectural working drawings.

Student Learning Outcomes

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

- SLO-1: Demonstrate ability to apply basic organizational and spatial principles to the conception and development of architectural environments for a residential design project.
- Demonstrate basic abilities at using problem solving and design process methodologies to identify problems, analyze criteria and apply learned principles to synthesize solutions to a specific residential design project; to assess and reflect on the success of the process and solution. Students should be able to analyze issues related to image, function and context in order to develop appropriate design and detail responses.
- SLO-2: Demonstrate and apply the skills associated with representing envisioned ideas, objects and environments.
- Employ appropriate drawing and representational media, including computer, manual drafting and duplication technology, to convey concepts and ideas at each stage of the project delivery process including programming, design and construction documents.
- Demonstrate ability to communicate architectural information on construction documents with the use of line-work, manual and digital lettering, symbols and drafting conventions.
- SLO-3: Identify and explain light frame construction including techniques, materials, systems and apply learned principles to create the drawings that control the construction of a building.
- Explain the basic technical elements of wood frame construction including layout; structural, mechanical and electrical sizing; framing techniques; detailing and apply learned principles to create the drawings that control building development.
- Describe and design site planning, grading, drainage and site systems and apply learned principles to create the drawings that control site development.
- Describe and design the primary building systems including structure, mechanical, electrical, weatherproofing, etc., that are integrated into a building and apply learned principles to create the drawings that control building development.
- Organize a set of documents including cross-referencing, code review, checklists, coordination, cartooning and other planning methods to create the documents that control building development.
- SLO-4: Identify and assume diverse roles that maximize individual talents and to cooperate with other students, when working as members of a team, to maximize accomplishment.
- Demonstrate active participation and contribution to a team effort as well as individual effort.
- SLO-5: Apply research, investigation and the skills associated with life-long learning.
- Demonstrate the use of comprehensive and graphic visual note-making in sketch books for recording of thoughts, observations, and design thinking to enhance research and independent learning within continuing education as a life-long pursuit.

ARCH 330 Design Fundamentals

Units:	3.5
Hours:	54 hours LEC; 27 hours LAB
Prerequisite:	ARCH 320 with a grade of "C" or better

Transferable: CSU; UC
Catalog Date: January 1, 2021

This course develops an understanding of design fundamentals in terms of materiality and the theories, concepts, creative problem solving processes, and skills pertaining to the analysis and design of architectural form, space and organizations to communicate intended concepts and meanings.

Student Learning Outcomes

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

- SLO-1: Apply basic organizational and spatial principles to the conception and development of architectural environments.
- use problem solving and design process methodologies to identify problems, analyze criteria and apply learned principles to synthesize solutions to specific design projects.
- assess and reflect on the success of the process and solution within the design methodologies.
- use organization systems, spatial geometry and principles of order (unity, balance, pattern, hierarchy, rhythm, etc.) to create meaning and relationships between elements.
- Identify and use a range of architectural design concepts, including the sequential experiences of approach, entry, arrival, continuum, open/implied versus closed/explicit space, and clear spatial figure, etc., to respond to discovered issues related to context, image and function.
- observe and analyze existing conditions, context, function and image, as well as define goals and issues to generate concepts that provide abstract meaning into architectural form and spaces.
- SLO-2: Comprehend and demonstrate the 2d and 3d skills associated with representing envisioned ideas, objects and environments.
- employ appropriate representational media including study and presentation models, freehand and conceptual drawing.
- compose analytical drawing and diagramming to convey visualize ideas and convey essential formal elements at each stage of the programming and design process.
- SLO-3: Demonstrate teamwork skills within active participation and contribution to a team effort.
- identify and employ diverse roles that maximize individual talents and to cooperate with other students, when working as members of a team, to maximize accomplishment.
- SLO-4: Demonstrate knowledge an understanding of historical, cultural, human, aesthetic, environmental and social issues to be able to affect creative change in the built environment.
- SLO-5: Demonstrate skills in research and investigation associated with architectural design and life-long learning.
- Sketch and use comprehensive and graphic visual note-making in sketch books for recording thoughts and observations for design thinking and to express the desire for research, independent learning and continuing education as a life-long pursuit.
- SLO-6: Demonstrate oral communication skills that are appropriate and effective within group discussion and oral presentation that pertains to design thinking.

ARCH 332 Design Awareness

Units: 3
Hours: 54 hours LEC; 18 hours LAB
Prerequisite: ARCH 320 and 321 with grades of "C" or better
Advisory: ARCH 330
Transferable: CSU; UC
General Education: AA/AS Area I; CSU Area C1
Catalog Date: January 1, 2021

This course examines design problems and the environment by providing theories, concepts, processes, studies and skills pertaining to space, form, structure, context, materials, climate, livability and sustainability. The course covers sustainability as a determinant that shapes and impacts the built environment.

Student Learning Outcomes

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

- SLO-1: Demonstrate ability to apply basic organizational and spatial principles to the conception and development of architectural environments.
- Use problem solving and design process methodologies to identify problems, analyze criteria and apply learned principles to synthesize solutions to specific design projects.
- Assess and reflect on the success of the process and solution for design methodologies.
- Demonstrate understanding and the ability to use organization systems, spatial geometry and principles of order (unity, balance, pattern, hierarchy, rhythm, etc.) to create meaning and relationships between elements.
- Demonstrate understanding and ability at using a range of architectural design concepts, including the sequential experiences of approach, entry, arrival, continuum, open/implied versus closed/explicit space, clear spatial figure, etc., in order to respond to discovered issues related to context, image and function.
- Observe and analyze existing conditions, context, function and image, as well as define goals and issues to generate concepts that provide abstract meaning into architectural form and spaces.
- SLO-2: Comprehend and demonstrate the 2d and 3d skills associated with representing envisioned ideas, objects and environments.
- Employ appropriate representational media including study and presentation models, freehand and conceptual drawing.
- Compose analytical drawing and diagramming to convey visualize ideas and convey essential formal elements at each stage of the programming and design process.
- SLO-3: Demonstrate teamwork skills within active participation and contribution to a team effort.
- Identify and employ diverse roles that maximize individual talents and to cooperate with other students, when working as members of a team, to maximize accomplishment.
- SLO-4: Demonstrate knowledge an understanding of historical, cultural, human, aesthetic, environmental and social issues to be able to affect creative change in the built environment.
- Demonstrate an understanding of sustainable environmental design by applying learned principles to create energy and resource conscious, climate-adapted architectural and environmental design.
- Demonstrate an awareness of sociological, cultural and urban planning issues by applying learned principles to create livable communities and architecture that support ecological, pedestrian and human environments.
- SLO-5: Demonstrate skills in research and investigation associated with architectural design and life-long learning.
- Sketch and use comprehensive and graphic visual note-making in sketch books for recording thoughts and observations for design thinking and to express the desire for research, independent learning and continuing education as a life-long pursuit.
- SLO-6: Demonstrate oral communication skills that are appropriate and effective within group discussion and oral presentation that pertains to design thinking.

ARCH 334 Advanced Design in Three Dimensions

Units:	3
Hours:	54 hours LEC; 18 hours LAB
Prerequisite:	ARCH 332 with a grade of "C" or better
Advisory:	ARCH 320 and 330
Transferable:	CSU
Catalog Date:	January 1, 2021

This course is a continuation of the content in ARCH 332 that emphasizes design process, with a focus on advanced design in terms of three dimensional design and design problems pertaining to the environment. The course studies the theories, concepts, processes and skills pertaining to space, form, structure, context, structure, materials, climate, and livability, as well as sustainability as determinants that shape and impact the built environment.

Student Learning Outcomes

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

- SLO-1: Apply basic organizational and spatial principles to the conception and development of architectural environments.
- Use problem solving and design process methodologies to identify problems, analyze criteria and apply learned principles to synthesize solutions to specific design projects at an advanced level.
- Assess and reflect on the success of the process and solution within the design methodologies.
- Demonstrate understanding and the ability to use organization systems, spatial geometry and principles of order (unity, balance, pattern, hierarchy, rhythm, etc.) to create meaning and relationships between elements.
- Demonstrate understanding and ability at using a range of architectural design concepts including the sequential experiences of approach, entry, arrival, continuum, open/implied versus closed/explicit space, clear spatial figure, etc. to respond to discovered issues related to context, image and function.
- Observe and analyze existing conditions, context, function and image, as well as define goals and issues to generate concepts that provide abstract meaning into architectural form and spaces.
- SLO-2: Understand and demonstrate the 2d and 3d skills associated with representing envisioned ideas, objects and environments.
- Employ appropriate representational media including study and presentation models, freehand and conceptual drawing.
- Compose advanced, analytical drawing and diagramming to convey visualize ideas and convey essential formal elements at each stage of the programming and design process.
- SLO-3: Demonstrate teamwork skills within active participation and contribution to a team effort.
- Identify and employ diverse roles that maximize individual talents and to cooperate with other students, when working as members of a team, to maximize accomplishment.
- SLO-4: Demonstrate knowledge an understanding of historical, cultural, human, aesthetic, environmental and social issues to be able to affect creative change in the built environment.
- Demonstrate an understanding of sustainable environmental design by applying learned principles to create energy and resource conscious, climate-adapted architectural and environmental design.
- Demonstrate an awareness of sociological, cultural and urban planning issues by applying learned principles to create livable communities and architecture that support ecological, pedestrian and human environments.
- SLO-5: Demonstrate advanced skills in research and investigation associated with architectural design and life-long learning.
- Sketch and use comprehensive and graphic visual note-making in sketch books for recording thoughts and observations for advanced design thinking and to express the desire for research, independent learning and continuing education as a life-long pursuit.
- SLO-6: Demonstrate oral communication skills that are appropriate and effective within group discussion and oral presentation that pertains to design thinking.

ARCH 342 Introduction to Green Buildings

Units:	3
Hours:	54 hours LEC
Prerequisite:	None.
Transferable:	CSU
Catalog Date:	January 1, 2021

This course is the study of theory and application of climate, energy use and thermal comfort as determinants of architectural form in envelope load dominated buildings. Emphasis is placed on sustainable architectural methods and topics related to resource conservation and waste reduction; site analysis; sun access; sun shading; daylighting; lighting, ventilating, cooling and heating for envelope-load dominated buildings; and sound in buildings. The course enhances students' knowledge base and preparation for design classes ARCH 332 and ARCH 334.

This course replaces the ARCH 340 and 341 two-course sequence, and is therefore not open to a student that has received credit for both ARCH 340 and 341.

Student Learning Outcomes

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

- SLO 1: Make reasonable architectural decisions based on the ethical, social, and environmental value of energy conscious design.
- Compare and contrast societal implications of utilizing non-renewable and renewable energy sources.
- Express how the relationship between building form, scale and location affects a building's successful response to the environment.
- Compare and contrast the effect of orientation and other contextual issues to evaluate their impact on energy consumption and beneficial experience of spaces.
- SLO 2: Identify and compare issues and alternatives related to the choice of various building systems; ideate and apply responsive solutions by integrating knowledge of climate, site, materials and assemblies as drivers of design.
- Understand the tools of performance assessment to analyze and calculate energy use so as to make informed choices to satisfy human needs for comfort and aesthetic.
- Analyze the context of buildings, evaluate needs and make informed choices that respond, in a sustainable way, to solar geometry, sun access, daylighting, shading, and photovoltaic systems.
- Describe the physics of light, including the luminous environment as architectural form-givers, and apply learned principles to the selection and design of electrical systems.
- Understand and demonstrate the concepts of waste reduction, water and resource conservation; calculate embodied energy and waste contribution; and make sustainable design

choices related to materials and construction.

- Understand the physics of sound, analyze requirements, calculate criteria and apply learned principles to the selection of walls, floors and ceilings for noise isolation or sound enhancement.
- Understand the concepts of human thermal comfort and performance; heat transfer; building materials, assemblies and systems; climate analysis, vernacular architecture and climate responsive architectural design; and be able to apply learned principles to analyze the context of buildings and climate, evaluate needs and synthesize informed, calculated choices that respond, in a sustainable way, to create thermal comfort.
- Describe strategies for passive heating and cooling and be able to apply learned principles to reduce energy consumption and provide thermal comfort for various climates including: hot arid, hot humid, cold and temperate.
- Describe and apply the principles of psychometrics to provide thermal comfort.
- Describe the various types of mechanical systems for heating and cooling buildings and be able to apply learned principles to propose responsive schematic design.
- SLO 3: Demonstrate independent learning, knowledge of teamwork principles and continuing education habits that will encourage a lifelong pursuit of knowledge, including the ability to gather, assess, record and comparatively evaluate relevant information.
- Use a teamwork process to identify issues, analyze criteria, research and apply learned principles to synthesize solutions to a specific design project.
- Demonstrate habits of visual note making and independent learning by developing a sketch and notebook to record learning and process for generating ideas.

ARCH 495 Independent Studies in Architecture

Units:	1 - 3
Hours:	54 - 162 hours LAB
Prerequisite:	None.
Transferable:	CSU
Catalog Date:	January 1, 2021

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 within one semester term) with a supervising instructor qualified within the discipline.
- Design an independent study (to be completed 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.

ARCH 498 Work Experience in Architecture

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.
Transferable:	CSU
General Education:	AA/AS Area III(b)
Catalog Date:	January 1, 2021

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 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)

ARCH 499 Experimental Offering in Architecture

Units: 0.5 - 4
Prerequisite: None.
Transferable: CSU
Catalog Date: January 1, 2021

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Architecture, A.S. Degree

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