

COMPILATION OF AEC STUDENT LEARNING OUTCOMES

AEC 80, Basic Drafting

Upon completion of the course, the student will be able to...

1. Identify, select, and use the basic manual drafting tools to complete assigned tasks..
2. Demonstrate proper line work, lettering, dimensioning, and symbolizing in creating drawings of industry standard quality.
3. Demonstrate the ability to center drawings, scale views, and draw neatly and accurately with the common drafting tools.
4. Create correct single, orthographic, auxiliary, isometric, sectional, perspective, and developed views of simple objects from different types of views or differently oriented views of the objects.
5. Create correct welded object, thread, and architectural floor plan drawings appropriate to the level of the course.
6. Using descriptive geometry techniques, find the true length, point, and true shape views of simple lines and planes from given skewed views.
7. Explain a few of the advantages of computer drafting over manual drafting, and explain the basic AutoCAD line drawing procedure and coordinate system for locating points on the computer screen.
8. Roughly define the terms, concepts, and standards associated with the topics of the course.
9. Demonstrate the ability to communicate electronically, seek help when needed, work from written instructions, and meet production deadlines.

AEC 110, Basic AutoCAD

Upon completion of the course, the student will be able to...

1. Use the AutoCAD® software program to create drawings from scratch and to modify, manipulate, copy, delete, save, and plot drawings.
2. Use the full range of AutoCAD® commands and options, use the keyboard, toolbar, and menu interfaces, and employ shortcuts and time-saving strategies to operate the program at a level of efficiency acceptable for employment as a CAD technician.
3. Create, render, and manipulate 3D AutoCAD® drawings and convert 2D drawings to 3D drawings.
4. Roughly define the terms, concepts, and standards associated with the topics of the course.
5. Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work, and meet production deadlines.
6. Demonstrate oral and written communication, computation, and problem-solving skills appropriate to the level of the coursework.

AEC 114, Architectural Graphics

Upon completion of the course, the student will be able to...

1. Use the AutoCAD® software program to draw 2D orthographic, pictorial, sectional, and developed views from real-world objects, or from drawings of other types or differently oriented views.
2. Use descriptive geometry techniques to find and draw in AutoCAD® the true length, point view, or true shape of a line or plane from given views showing it skewed to all standard planes.
3. Visualize and demonstrate by drawing, sketching, or identifying a prescribed new view of an object.
4. Use the full range of tools in a computer 3D modeling program such as SketchUp® to create, modify, and manipulate 3D drawings of objects and to create fly-arounds, walk-throughs, or slideshows of fully rendered models.
5. Create proportionally correct, rendered, pencil sketches of real-world objects or scenes.
6. Roughly define the terms, concepts, and standards associated with the topics of the course.
7. Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work, and meet production deadlines.
8. Demonstrate oral and written communication, computation, and problem-solving skills appropriate to the level of the coursework.

AEC 118, Construction Materials

Upon completion of the course, the student will be able to...

1. Discuss and, where appropriate, compare the manufacturing processes, components, sources, varieties, and uses of the basic building materials, products, and systems presented in the course.
2. Roughly define the common terms and concepts associated with the topics of the course.
3. Describe the CSI format and its purpose, and name at least two-thirds of its divisions.
4. Participate regularly and appropriately in online group discussions about class material, and seek the help of peers, supervisors, or others as needed.
5. Demonstrate written communication, reading, and computation proficiencies at a level appropriate to the coursework.

6. Demonstrate model-building and basic drawing/sketching proficiencies in the completion of course construction and graphic communication projects related to topics of the course.

AEC 120, Introduction to Construction Drawings

Upon completion of the course, the student will be able to...

1. Use the AutoCAD® software program to create common construction drawings (foundation plans, floor plans, elevations, framing plans, details, etc.) complete with labels and dimensions for one or more small buildings.
2. Design the foundation and the floor, wall, and roof framing of a small residential building.
3. Apply the layout, line weight, and other basic drawing and presentation standards to produce drawings of industry standard quality.
4. Roughly define the terms, concepts, and standards associated with the topics of the course.
5. Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work, and meet production deadlines.
6. Demonstrate oral and written communication, computation, and problem-solving skills appropriate to the level of the coursework.

AEC 123, Residential Planning and Design

Upon completion of the course, the student will be able to...

1. Explain and demonstrate the building design process.
2. Describe and apply reasonable space requirements, code restrictions, site and building orientation constraints, and room proximity standards to development of a residential design.
3. Use the AutoCAD® and SketchUp® computer programs (or similar programs) to develop and finalize an architectural design.
4. Clearly and adequately explain a design in presentation of it to a group or students or others, and fairly and objectively critique designs and presentations of others.
5. Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work, and meet production deadlines.
6. Demonstrate oral and written communication, computation, and problem-solving skills appropriate to the level of the coursework.

AEC 124, Building Information Modeling Software

Upon completion of the course, the student will be able to...

1. List four advantages of using a Building Information Model-based CAD software over 2D-based CAD software.
2. Demonstrate the appropriate software commands to create a 3D building model including the following assemblies: walls, floors, doors, windows, roofs, components, dimensions, stairs
3. Identify the proper method to change the configuration/parameters of the objects listed above.
4. Compose a sheet for printing views of the building.
5. Demonstrate the loading of components into a building model.
6. Create a perspective view of a building model.
7. Create a walk-through animation of a building model.
8. Create a still rendering of a building model.
9. Print a sheet from a building model set.
10. Import a vector-based reference drawing into a model file.
11. Demonstrate oral and written communication, computation and problem-solving skills appropriate to the level of the coursework.

AEC 127, Civil Engineering Drawing

Upon completion of the course, the student will be able to...

1. Draw, label, and explain property boundary lines of prescribed lengths and directions in either bearing or azimuth formats.
2. Given point descriptions, draw and label contour lines that indicate topography in land drawings, and "read" contour lines to explain landforms.
3. Manipulate contour lines in topographic drawings to represent excavations for level building areas or level or inclined driveways and roads with specific or maximum embankment angles.
4. Use the Autodesk Land Desktop® computer program (or similar program) to set up projects and drawings, place and label points in drawings, import points from datasets, create and manage point groups, create and label property boundary lines, generate and edit contour lines, and display and manipulate 3D models of land surfaces.
5. Roughly define the terms, concepts, and standards associated with the topics of the course.

6. Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work, and meet production deadlines.
7. Demonstrate oral and written communication, computation, and problem-solving skills appropriate to the level of the coursework.

AEC 130, Residential Working Drawings

Upon completion of the course, the student will be able to...

1. Demonstrate the setup and organization of a residential drawing project set using CAD software.
2. Using Computer-Aided Design (CAD) software, draw a set of two-story residential construction drawings to include:
 - a. A title sheet
 - b. A site plan
 - c. A foundation plan
 - d. A floor framing plan
 - e. A roof framing plan
 - f. Exterior elevations
 - g. Interior elevations
 - h. Building sections
 - i. Wall sections
 - j. Details
 - k. A window schedule
 - l. A door schedule
 - m. A room finish schedule
3. Prepare a brief site data analysis using the current version of the *City and County of Honolulu Land Use Ordinance* that proves the residential project complies with land use regulations.
4. Demonstrate the annotation of a complete set of architectural drawings using text, tags, dimensions and callouts.
5. Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work and meet production deadlines.

AEC 131, Construction Codes

Upon completion of the course, the student will be able to...

1. Using the City and County of Honolulu Land Use Ordinance:
 - a. Select the correct zoning required for a particular land use
 - b. Identify the correct front, rear and side yard setbacks
 - c. Determine the maximum area or density of development on a parcel of land
 - d. Calculate and draw the building envelope for a residential project
 - e. Determine the minimum number of parking spaces required for a small commercial project
 - f. Determine the minimum number of parking spaces required for a residential project
 - g. Describe and draw the standard parking space used in the city and county
 - h. Explain at least three reasons for the existence of the land use ordinance
 - i. Explain the main difference between the land use ordinance and the building code
 - j. Calculate the correct number of loading spaces required for a small commercial project
 - k. Determine the correct landscaping and screening for a commercial parking lot
 - l. Define what a flag lot is
 - m. Describe the setbacks for a flag lot parcel of land
 - n. Describe the purpose of zoning
 - o. Explain where the building height of a commercial project can be obtained
2. Using the Building Code:
 - a. Determine the Occupancy/Occupancies for a given building use or uses
 - b. Determine the minimum occupancy separation for two adjacent occupancies
 - c. Define the term Construction Type

AEC 135, Intro to the Built Environment

Upon completion of the course, the student will be able to...

1. Describe the roles of various design professionals in the creation of the built environment.
2. Describe a building by breaking it down into its 2D and 3D fundamental components.
3. List the environmental responses of a building to its location.
4. Give a report on a well-known architect.
5. Explain some of the coursework taken by architecture students pursuing an architectural degree.
6. Demonstrate oral and written communication skills appropriate to the level of the coursework.

AEC 136, Structural Drawing

Upon completion of the course, the student will be able to...

1. Prepare floor-framing plans for buildings with steel, concrete and wood structural systems.
2. Prepare details and sections of buildings with steel, concrete and wood structural systems.
3. Demonstrate the use of basic welding symbols.
4. Demonstrate the preparation of detail drawings sheets using different scaled drawings.
5. Use the Steel Manual to select the proper sectional characteristics for a given structural steel building component.
6. Demonstrate oral and written communication, computation and problem-solving skills appropriate to the level of the coursework.
7. Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work and meet production deadlines.

AEC 138, Construction Estimating and Bidding

Upon completion of the course, the student will be able to...

1. Determine the proper unit of measure for a quantity of specific building components.
2. Define terminology specific to the profession of building estimators.
3. Prepare a quantity take-off for a small building.
4. Determine pricing for building components using reference literature and/or estimating software.
5. Prepare an outline of the sequence of events in the estimating process for a building.
6. Demonstrate oral and written communication, computation and problem-solving skills appropriate to the level of the coursework.
7. Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work and meet production deadlines.

AEC 140, Commercial Working Drawings

Upon completion of the course, the student will be able to...

1. Demonstrate the setup and organization of a commercial or multi-family apartment building drawing project set using CAD software.
2. Using Computer-Aided Design (CAD) software, draw a set of construction drawings for a commercial or multi-family apartment building to include:
 - a. A title sheet
 - b. A site plan
 - c. A foundation plan
 - d. A floor framing plan
 - e. A roof framing plan
 - f. Exterior elevations
 - g. Interior elevations
 - h. Building sections
 - i. Wall sections
 - j. Details
 - k. A window schedule
 - l. A door schedule
 - m. A room finish schedule
3. Prepare a brief site data analysis using the current version of the City and County of Honolulu Land Use Ordinance that proves the commercial or apartment project complies with land use regulations.
4. Demonstrate the annotation of a complete set of architectural drawings using text, tags, dimensions and callouts.
5. Describe some of the building areas that need to be addressed when making a commercial or apartment building accessible for handicapped users.
6. Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work and meet production deadlines.
7. Demonstrate oral and written communication, computation and problem-solving skills appropriate to the level of the coursework.

AEC 141, Building Services

Upon completion of the course, the student will be able to...

1. Identify the fundamental components of a water supply system.
2. Identify the fundamental components of a building drainage/waste/vent system.
3. Prepare a simple electrical layout and electrical panel schedule.

4. Demonstrate the use of the Psychometric Chart in determining human comfort zones.
5. Identify at least two different types of elevator.
6. Identify systems and/or components that are used to conserve resources such as electricity and water.
7. Illustrate the different components in the refrigeration cycle.
8. Prepare a basic illustration of an air conditioning duct system.
9. Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work and meet production deadlines.
10. Demonstrate oral and written communication, computation and problem-solving skills appropriate to the level of the coursework.

AEC 146, Autodesk VIZ

Upon completion of the course, the student will be able to...

1. Model 3D primitives using 3D software.
2. Create 3D objects from 2D objects using modification commands in 3D software.
3. Create 3D models using lights and material modifiers for photorealistic effects.
4. Create a simple animation using 3D software.
5. Export 3D animation movies for viewing using 3D software.
6. Create complex 3D models using additive and subtractive modeling techniques in 3D software.
7. Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work and meet production deadlines.

AEC 149, Preparation for Employment in the AEC Industry

Upon completion of the course, the student will be able to...

1. Correctly and completely fill out an employment application.
2. Create a professional resume and well-written cover letter.
3. Innumerate some of the common questions that are asked at job interviews, and give a pre-planned response to each.
4. Create a professional impression of oneself at a job interview and effectively respond to common, uncommon, and even illegal interview questions.
5. Create, maintain, and present a professional portfolio.
6. Model and describe attitudes, work habits, and other factors that relate to success on the job after employment is obtained.
7. Select appropriate materials for inclusion in a portfolio.
8. Create a layout that accentuates presented work in a portfolio.
9. Compose and print images of work for inclusion in a portfolio.
10. Explain the proper use of text in relation to images when presenting a portfolio.