Foundational Courses

TEDR 1000 Technical Drafting **4 Credits / 120 Clock-Hours**

The Technical Drafting course is designed to help students develop and build familiarity with fundamental drafting concepts. Discussion concepts will include preparing industry standard documents using a drafting software.

Objectives:
• Explore various design fields including architecture, mechanical design, and/or civil design.
• Use sketching to communicate designs.
• Create isometrics, orthographic projections, sections, and auxiliary drawings, including basic annotations and dimensions.
• Use a CAD system as a drafting tool.
• Develop, modify, and plot CAD drawings.

TEDR 1010 Advanced Technical Drafting **3 Credits / 90 Clock-Hours**

The Advanced Technical Drafting course explores Computer Aided Drafting (CAD) to prepare and iterate advanced industry standard documents. Using these documents, students will then create a physical 3D model.

Objectives:
● Conceptualize and sketch architectural and mechanical designs.
● Use a CAD system as an advanced drafting tool.
● Practice iterating architectural and mechanical designs.
● Create a physical 3D model.

Architectural Drafting

TEDR 1100 Residential Drafting **3 Credits / 90 Clock-Hours**

The Residential Drafting course serves as an introduction to residential design and explores emerging CAD tools to design a code-compliant home. Students will learn about residential materials and methods of construction to prepare construction documents that align with industry standards.

Objectives:
● Describe the function of architectural drawings.
● Define terminology and processes related to residential design and construction.
● Explore form, function, and sustainability in design and construction.
● Identify areas for review and iteration through redlining.
● Create a set of code-compliant construction documents.
● Explain the need for and apply the ADA (Americans with Disabilities Act) in design.

TEDR 1110 Introduction to Building Information Modeling **3 Credits / 90 Clock-Hours**

The Introduction to Building Information Modeling course teaches 3D architectural tools to explore Building Information Modeling (BIM). Students will demonstrate their learning of architectural drafting skills including architectural detailing and methods of construction to prepare architectural documents that align with industry standards.

Objectives:
• Use 3D modeling to communicate design intent.
• Create architectural documents.
• Explain the importance and purpose of BIM.
• Quantify model information.

TEDR 2800 Capstone Project **3 Credits / 90 Clock-Hours**

The Capstone Project course applies program-acquired skills and knowledge through a comprehensive student-defined project, culminating in a practical demonstration of expertise in drafting. Students will navigate project management, integrating analysis and iteration.

Objectives:
• Develop a project scope.
• Establish clear and achievable objectives.
• Schedule a workflow.
• Develop quality, professional-level drafts that align with objectives.
• Manage project milestones professionally.
• Present completed project.

Mechanical Drafting

TEDR 1200 Parametric Solid Modeling **3 Credits / 90 Clock-Hours**

The Parametric Solid Modeling course explores parametric solid modeling, a process of feature and dimension driven design, for the creation of basic models. Students will learn about model/drawing association, best modeling practices, and industry standards.

Objectives:
● Use commands and modeling strategies to create solid model parts and assemblies.
● Define terminology and processes related to parametric modeling.
● Develop drawings from created models.
● Interpret engineering design intent.
● Identify areas for review and iteration through redlining.

TEDR 2200 Advanced Solid Modeling **3 Credits / 90 Clock-Hours**

The Advanced Solid Modeling course explores parametric modeling techniques for creating complex models and assemblies. Students will learn about advanced tools and design methods.

Objectives:
• Create multi-body parts.
• Develop sheet metal parts and drawings.
• Use 3D sketches to model parts and assemblies.
• Apply surface drafting techniques.
• Use tables to formulate equations for manual calculations.
• Create equations, global variables, and configurations to design parametric models.

TEDR 2800 Capstone Project **3 Credits / 90 Clock-Hours**

The Capstone Project course applies program-acquired skills and knowledge through a comprehensive student-defined project, culminating in a practical demonstration of expertise in drafting. Students will navigate project management, integrating analysis and iteration.

Objectives:
• Develop a project scope.
• Establish clear and achievable objectives.
• Schedule a workflow.
• Develop quality, professional-level drafts that align with objectives.
• Manage project milestones professionally.
• Present completed project.

Civil Drafting

TEDR 1130 Commercial Drafting **3 Credits / 90 Clock-Hours**

This course covers commercial and structural design techniques using 3D parametric CAD software. This course will introduce the interface and basic building components of the software to create levels, grids systems, and various views. This course will introduce how linking a structural project with an architectural model provides efficient project updates between design teams. This course will focus on structural columns, walls, foundations, reinforcement, beams, framing systems, and basic Building Information Modeling (BIM) practices and applications.

Objectives:
• Demonstrate basic drawing and/or editing tools
• Identify levels and grids
• Create the necessary views
• Link an architectural model to a structural project
• Adding structural columns and/or walls
• Adding foundations and/or structural slabs
• Create structural reinforcement
• Create beams and framing systems
• Create construction documents
• Annotate construction documents
• Create detailing
• Create scheduling

TEDR 1300 Civil Drafting **3 Credits / 90 Clock-Hours**

The Civil Drafting course will teach the basic skills and concepts needed to design land development projects including concepts related to civil engineering and surveying in general. This course will provide a solid foundation that can be used to perform basic civil design tasks to organize project data, work with points, create and analyze surfaces, model road corridors, create parcel layouts, perform grading and volume calculations, and layout pipe networks.

Objectives:
• Create and edit parcels and print parcel reports.
• Create points and point groups and work with survey figures.
• Create and manage styles and label styles.
• Create, edit, view, and analyze surfaces.
• Create and edit alignments.
• Create data shortcuts.
• Create sites, profiles, and cross-sections.
• Create assemblies, corridors, and intersections.
• Create grading solutions.
• Create gravity fed and pressure pipe networks.
• Perform quantity takeoff and volume calculations.
• Use plan production tools to create plan and profile sheets.

TEDR 2800 Capstone Project **3 Credits / 90 Clock-Hours**

The Capstone Project course applies program-acquired skills and knowledge through a comprehensive student-defined project, culminating in a practical demonstration of expertise in drafting. Students will navigate project management, integrating analysis and iteration.

Objectives:
• Develop a project scope.
• Establish clear and achievable objectives.
• Schedule a workflow.
• Develop quality, professional-level drafts that align with objectives.
• Manage project milestones professionally.
• Present completed project.

Supplemental Courses Varies by Institution

Bridgerland

TEDR 1003 Career and Workplace Relations **1 Credit / 30 Clock-Hours**

The Career and Workplace Relations course is designed to help students gain insight into how their skills and professionalism enhance relationships between management and coworkers. Instruction includes employment skills such as communication, critical thinking, professional etiquette, and team dynamics.

Objectives:
- Identify personal and transferable skills, competencies, and/or abilities.
- Create an industry specific resume, cover letter, thank you letter, reference list, and online presence.
- Demonstrate effective interviewing skills.
- Submit an application for an industry specific position.
- Demonstrate effective use of job search websites.

TEDR 1015 Applied Technical Math **1 Credit / 30 Clock-Hours**

The Applied Technical Math course includes introductions to geometry, algebra, and trigonometry as they apply to the drafting and design industry standards. Students will practice solving basic geometric, algebraic, and trigonometric equations.

Objectives:
- Solve equations using basic geometry.
- Solve equations using basic algebra.
- Solve equations using basic trigonometry.

TEDR 1020 Computer Illustration **2 Credits / 60 Clock-Hours**

This course is designed to teach students techniques and procedures for developing illustrations and renderings using a personal computer and current industry standard illustration software.

Objectives:
- Use a computer system as a creation and rendering tool.
- Operate current industry illustration software.
- Integrate graphics into physical media.
- Export projects into different file types.

TEDR 1130 Commercial Drafting **3 Credits / 90 Clock-Hours**

This course covers commercial and structural design techniques using 3D parametric CAD software. This course will introduce the interface and basic building components of the software to create levels, grids systems, and various views. This course will introduce how linking a structural project with an architectural model provides efficient project updates between design teams. This course will focus on structural columns, walls, foundations, reinforcement, beams, framing systems, and basic Building Information Modeling (BIM) practices and applications.

Objectives:
• Demonstrate basic drawing and/or editing tools
• Identify levels and grids
• Create the necessary views
• Link an architectural model to a structural project
• Adding structural columns and/or walls
• Adding foundations and/or structural slabs
• Create structural reinforcement
• Create beams and framing systems
• Create construction documents
• Annotate construction documents
• Create detailing
• Create scheduling

TEDR 1170 Structural Steel Detailing **3 Credits / 90 Clock-Hours**

This course covers topics such as: the fundamentals of structural design, structural steel detailing of beams, columns, braces, templates, bill of materials, welding symbols, and creation of construction documents to industry standards.

Objectives:
• Identify structural shapes and sizes.
• Identify miscellaneous steel shapes and applications.
• Demonstrate connection types, bolted, welded, knife, and bearing.
• Create a bill of materials.
• Identify job specifications.
• Demonstrate AISC standards.
• Create structural steel construction documents.

TEDR 1210 Mechanical Design **4 Credits / 120 Clock-Hours**

This course explores advanced mechanical design features including threads, fasteners, gears, cams, jigs, fixtures, and weldments. Concepts also include measuring techniques, types of fit and their function, and advanced working drawings.

Objectives:
• Identify measuring tools utilized in machine shops and production drawings.
• Produce different types of threads on drawings.
• Produce working drawings involving weldments.
• Produce drawings utilizing gears, cams, jigs, and fixtures.
• Identify different types of mechanical fasteners.
• Demonstrate methods used for injection molds.

TEDR 1220 Production Drafting **4 Credits / 120 Clock-Hours**

The Production Drafting course makes use of CAD to create industry level production working drawings. Students will learn and use the latest American Society of Mechanical Engineers (ASME) Y14.5 standards for Geometric Dimensioning & Tolerancing (GD&T).

Objectives:
- Apply general tolerancing.
- Identify GD&T symbols.
- Define GD&T terms.
- Establish datums, material conditions, and boundaries.
- Recognize geometric characteristics.

TEDR 1240 Rapid Prototyping **1 Credit / 30 Clock-Hours**

This course provides an introduction to the use of computer aided drafting software and 3D printing. Instruction will be given on items such as: 3D design, 3D printing methods, materials, design optimization, file types, and prototyping uses.

Objectives:
- Create 3D models using CAD software.
- Optimize models for printing.
- Convert 3D model file types.
- Print models using 3D printers.
- Analyze printed models for design revision.

TEDR 2000 Portfolio Development **1 Credit / 30 Clock-Hours**

This course provides students the opportunity to gain deeper knowledge in areas previously studied, create advanced drafting portfolio pieces, and improve previous projects for portfolio presentation.

Objectives:
- Assemble projects into a cohesive portfolio.
- Demonstrate advanced drafting knowledge in portfolio pieces.
- Improve completed projects for display purposes.

TEDR 2050 Small Business **2 Credits / 60 Clock-Hours**

This course teaches students the basics of creating their own small business. Students will create a business plan that will demonstrate an understanding of their industry including competition, demand, location, growth potential, licensing, taxes, financial projections, and legal council needs.

Objectives:
- Conduct an industry analysis.
- Calculate startup costs.
- Determine target customer demographics.
- Develop a business plan.
- Develop an advertising/marketing plan.

TEDR 2110 Intermediate Architectural Drafting **4 Credits / 120 Clock-Hours**

This course is designed to guide students through the development of a complete set of residential building plans. The class includes topics such as: introduction to building codes, site planning, energy conservation, and solar energy alternatives plus detailing stairs, doors, windows, and other architectural elements.

Objectives:
• Draw floor plans.
• Draw exterior and interior elevations.
• Draw sections and details.
• Develop site plans.
• Apply building code principles.
• Develop complete set of construction documents.

TEDR 2205 Solid Modeling Certification **3 Credits / 90 Clock-Hours**

This course gives students advanced solid modeling preparation that is specific to national certification requirements in industry standard software. Students will learn testing applications and complete a series of practice tests before attempting national certification exams.

Objectives:
• Identify areas for study based on certification preparation materials.
• Complete certification level practice tests.
• Complete national certification exams.

Davis

TEDR 1030 Materials and Methods I **2 Credits / 60 Clock-Hours**

The Materials and Methods I course covers the typical materials and construction methods used in residential construction. Students will gain insights into residential construction practices through a blend of practical exercises.

Objectives:
• Define terminology and processes related to residential design and construction.
• Describe building materials used in residential construction.
• Identify building materials in residential construction details.
• Develop construction details.
• Create an energy efficiency compliance report.
• Reproduce typical residential wall section assemblies.

TEDR 1031 Materials and Methods II **2 Credits / 60 Clock-Hours**

The Materials and Methods II course covers the typical materials and construction methods used in commercial construction. Students will gain insights into commercial construction practices through a blend of practical exercises.

Objectives:
• Define terminology and processes related to commercial design and construction.
• Describe building materials used in commercial construction.
• Identify building materials in commercial construction details.
• Develop construction details.
• Create an energy efficiency compliance report.
• Reproduce typical commercial wall section assemblies.

TEDR 1135 Commercial Drafting I **2 Credits / 60 Clock-Hours**

The Commercial Drafting I course delves into building codes, regulations, and compliance standards to create the framework for commercial building projects. Students will use Building Information Modeling (BIM) to create schematic building models.

Objectives:
• Identify the importance of building codes.
• Interpret commercial construction documents.
• Reference the International Building Code.
• Locate requirements for a submittal process.
• Conduct a code analysis.

TEDR 1136 Commercial Drafting II **3 Credits / 90 Clock-Hours**

The Commercial Drafting II course engages Building Information Modeling (BIM) to create precise and detailed building models. Students will develop the necessary skills to translate commercial design and code concepts into professional construction documents.

Objectives:
• Interpret commercial construction documents.
• Reference the International Building Code.
• Create a set of code-compliant construction documents.
• Participate in a mock submittal process.
• Redline drawings by marking up areas for improvement.
• Modify drawings.

TEDR 1160 Design Integration **3 Credits / 90 Clock-Hours**

The Design Integration course explores integrated design, an approach where experts collaborate early to make buildings perform better. Students will discover how combining different design skills leads to more effective solutions for building projects.

Objectives:
• Interpret design consultant drawings.
• Apply principles of Building Information Modeling (BIM).
• Develop construction details.
• Create preliminary construction documents for multiple disciplines.

TEDR 1165 Virtual Design for Construction **2 Credits / 60 Clock-Hours**

The Virtual Design for Construction course explores digital technologies to create virtual representations of construction projects. Students will learn to plan and analyze projects digitally before construction, fostering efficiency.

Objectives:
• Interpret point clouds.
• Apply principles of Building Information Modeling (BIM).
• Develop plans detailing various phases of construction.
• Conduct interdisciplinary clash detection.
• Identify aspects of construction administration.

TEDR 1221 Production Drafting I **1 Credit / 30 Clock-Hours**

The Production Drafting I course delves into the practical realm of blueprint reading for manufacturing. Students will learn about industry standards to successfully interpret technical drawings.

Objectives:
• Identify and explain the components of a technical drawing.
• Interpret and analyze information presented on technical drawings.
• Interpret common symbols, abbreviations, and annotations used in technical drawings.
• Apply blueprint reading skills to solve practical problems.
• Redline technical drawings' by detecting errors, omissions, and discrepancies.

TEDR 1222 Production Drafting II **2 Credits / 60 Clock-Hours**

The Production Drafting II course delves into the practical realm of blueprint reading for manufacturing. From understanding industry standards to utilizing parametric modeling software, students will learn the essentials of creating precise technical drawings.

Objectives:
• Apply methods of baseline dimensioning.
• Adhere to industry standards in technical drafting practices.
• Create production-ready drawings.
• Redline drawings by marking up areas for improvement.
• Modify models, assemblies, and drafts.

TEDR 1223 Production Drafting III **2 Credits / 60 Clock-Hours**

The Production Drafting III course delves into the practical realm of drafting for manufacturing. From understanding industry standards to utilizing parametric modeling software, students will learn about applications of geometric, dimensioning, and tolerancing (GD&T) to create precise toleranced technical drawings.

Objectives:
• Identify and interpret GD&T processes and symbols.
• Apply methods of baseline/datum dimensioning.
• Adhere to industry standards in technical drafting practices.
• Create toleranced production-ready drawings.
• Redline drawings by marking up areas for improvement.
• Modify models, assemblies, and drafts.

TEDR 1230 Reverse Engineering **3 Credits / 90 Clock-Hours**

The Reverse Engineering course involves analyzing products and systems to understand how they work. Students will utilize insights gained to improve the design and function of original items.

Objectives:
• Interpret design engineer drawings.
• Locate design characteristics within manufacturer's reference materials.
• Develop advanced models and drawings to industry standards.
• Redline drawings by marking up areas for improvement.
• Modify advanced models and drawings.

TEDR 1245 Rapid Prototyping **2 Credits / 60 Clock-Hours**

The Rapid Prototyping course uses design thinking—a problem-solving method emphasizing innovation and user-centered design. Students will create and iterate prototypes to solve design challenges effectively and innovatively.

Objectives:
• Apply principles of design thinking to design challenges.
• Use prototyping to develop solutions to design challenges.
• Evaluate prototype effectiveness through testing and reflection.
• Refine designs based on feedback and user needs.

Dixie

TEDR 1015 Applied Technical Math **1 Credit / 30 Clock-Hours**

The Applied Technical Math course includes introductions to geometry, algebra, and trigonometry as they apply to the drafting and design industry standards. Students will practice solving basic geometric, algebraic, and trigonometric equations.

Objectives:
● Solve equations using basic geometry.
● Solve equations using basic algebra.
● Solve equations using basic trigonometry.

TEDR 1115 Applied Building Modeling **3 Credits / 90 Clock-Hours**

The Applied Building Modeling course expands exposure to BIM through an individual project. Project requirements will include building design to satisfies a buildings functions program that conforms to the specific site constraints of property size zoning requirements and building code requirements.

Objectives:
• Employ BIM three-dimensional capabilities to an architectural project.
• Create floor plans, exterior elevations, section drawings.
• Illustrate the rendering capabilities of BIM.

TEDR 1150 Architectural Print Reading **1 Credit / 30 Clock-Hours**

The course covers the basic knowledge and skills needed to accurately interpret construction drawings for residential and light commercial construction. Understanding construction specifications that accompany construction drawings are covered. Plans are used in the field of architecture, engineering, and planning along with many other technical applications.

• Objectives:
• Answer questions that connect construction documents with the construction of buildings.
• Answer questions that connect written specifications and drawings are required to build a project.
• Create material quantities identified in construction documents.
• Compare the role of the various design disciplines that are needed for an architectural project to be constructed, architects, engineers, project managers, and contractors.
• Recognize the basic terminology common to the industry and identify the importance of word clarity in communications between those involved in a project.

TEDR 1180 Residential Construction Documents **3 Credits / 90 Clock-Hours**

This course introduces the industry requirements for residential construction documents. Understanding residential construction methods and materials is essential in the design and construction document phase of a project and is significant emphasis in this course.

Objectives:
• Apply typical organizational drawing conventions used in architectural construction documents through original work.
• Communicate design and construction requirements in technical drawings.
• Research and incorporate materials into a construction project and identify them in a construction document.
• Specify the various materials in construction components, floors, walls, roofs, openings, etc.
• Express through design the basics of energy-efficient buildings.
• Express through design the elements of residential structural systems and how they are employed.

TEDR 1181 Commercial Construction Documents **4 Credits / 120 Clock-Hours**

This course serves as an introduction to commercial design, exploring zoning, code and laws using emerging BIM tools to design functional code-compliant buildings. Discussion concepts will include commercial materials and methods of construction to prepare construction documents that align with industry standards.

Objectives:
• Apply BIM (Building Information Modeling) in a commercial project.
• Create the basics of a construction document for a commercial building.
• Design Presentation Documents.
• Develop designs related to form, function, and space planning.
• Create a commercial Site Plan.
• Develop a structural system for a building.
• Incorporate the applicable ADA and International Building Code requirements in building design.

TEDR 1205 Parametric Applications **3 Credits / 90 Clock-Hours**

This course covers advanced parametric solid modeling. Discussions concepts include complex models, assemblies, photo realistic rendering, and animation along with other tools to check parts and assemblies for proper fit, form, and function.

Objectives:
• Apply knowledge of commands and modeling strategies to create complex solid model parts and assemblies.
• Use various assembly modeling techniques.
• Create and interpret engineering drawings composed of multiple views with standard dimensioning and tolerancing.
• Develop models and drawings to industry standards.

TEDR 1250 Mechanical Print Reading **1 Credit / 30 Clock-Hours**

The purpose of this course is to help students develop a basic understanding of the interpretation of mechanical drawings used in today's industries. Drawing formats, schedules, symbols, dimensions, and notes will be studied to familiarize the students with the standards used world-wide today.

Objectives:
• Identify industry conventions of the various drawing sheets and formats.
• Visualize shapes in various drawing formats, views, and disciplines.
• Interpret both first and third angle projection views.
• Implement the appropriate reading of measuring systems, including scales, rules, calipers and micrometers.
• Identify various fasteners commonly used in manufacturing.
• Define terminology and processes related to parametric modeling.
• Interpret engineering design intent.

TEDR 1260 Drafting GD&T, FEA, CAM **2 Credits / 60 Clock-Hours**

This class covers some of the applications for further processing the solid model using GD&T (Geometric Dimensioning and Tolerancing), FEA (Finite Element Analysis), and CAM (Computer Aided Machining). These applications aid in the further definition of the model's physical form as well as the next steps in the manufacturing process such as 3D prototyping and CAM programs and simulations.

Objectives:
• Identify and integrate the standard dimensions, symbols, and practices unique to the GD&T discipline.
• Model with 3D printers and materials; troubleshoot printing methods; and position parts.
• 3D print with slicing software used to convert the process into G-code.
• Use FEA programs to facilitate the design check and optimization of a part designed by the student using Von Mises Stress and a factor of safety. Plot the results to validate the studies.
• Use the modeling software to take the model into a CAM setup and processing into a functional G-code and simulated machining step operation.

TEDR 1535 Design to Manufacturing **3 Credits / 90 Clock-Hours**

The purpose of this course is to help students develop a basic understanding of manufacturing materials and processes as used in the industry today.

Objectives:
• Define the standard terminology and techniques used in manufacturing.
• Apply engineering materials and their distinguishing characteristics in original work.
• Demonstrate manufacturing process capabilities and limitations in original design work.
• Demonstrate component design for selected manufacturing process in original work.
• Recommend both an appropriate engineering material and manufacturing process for a given application.

TEDR 2810 Architectural Special Projects **2 Credits / 60 Clock-Hours**

This course examines the various aspects of an architectural project in depth. A project building type will be selected based on viability, community need/support, and economic success. BIM will be used to develop schematic designs. A significant project element and a project's success is site selection.

Objectives:
• Explain the various needs employed in developing the building program elements.
• Demonstrate a logical analysis in a site selection.
• Design a schematic building plan.
• Apply BIM to refine the elements of a schematic plan.
• Describe the materials and structural system using BIM.
• Illustrate the proposed project using BIM 3dimensional capabilities.

TEDR 2815 Mechanical Special Projects **1 Credit / 30 Clock-Hours**

This course examines the various aspects of a mechanical project in depth. A project will be selected based on viability, needs, and economic success. Parametric models will be used to develop various designs and iterations. Analysis of the business plan is essential in the selection process.

Objectives:
• Explain the various needs employed in developing the design project.
• Demonstrate a logical analysis of the design, manufacturing, and business plan.
• Create a parametric solid model with design iterations.
• 3D print prototypes of each design for review.
• Estimate materials, costs, manufacturing, packaging, and marketing of the project.
• Present a complete project proposal based upon research and development.

Ogden-Weber

TEDR 1035 Construction Materials and Methods **3 Credits / 90 Clock-Hours**

This course describes the uses of various fasteners, the proper use of tools specific to the carpentry trade, how to interpret a set of blueprints and successfully accomplish material take-offs, build a basic floor according to the blueprint drawings, erect walls with window and door openings according to building plans, construct gable and hip roof systems, calculate riser and tread lengths, and cut out a stair stringer.

Objectives:
• Describe building materials used in construction work.
• Identify hand tool and power tool operations, with care and maintenance.
• Define techniques for reading and using construction drawings and specifications.
• Demonstrate procedures for framing floor, wall, roof and stair systems and proper installation of doors and windows.
• Define the concept of the building envelope and its components.

TEDR 1108 Architectural CAD Modeling Interior Design **4 Credits / 120 Clock-Hours**

This course explores how to create and manipulate architectural entities through simple but effective 3D modeling and how to model many elements within the architectural world.

Objectives:
• Design every element in a room.
• Create from simple to complex architectural structures.
• Acquire furniture and accessories from database.
• Model furniture from scratch.
• Apply colors, textures, and materials.

TEDR 1120 Residential Architectural Design **4 Credits / 120 Clock-Hours**

This course explores family housing, drafting standards, construction principles, and space planning. Students will create a single-family residence using 3D architectural CAD software. The following topics will be explored: floor plans, elevations, roof design, sections, details, interior design, schedules, rendering, site plans, and sheet sets. Additionally, the course will cover interface usage, linework, 2D drawing tools, symbols, annotations, and sheet layout. This course will focus on a home design containing all the elements covered in the course.

Objectives:
• Demonstrate architectural freehand sketching.
• Create Floor Plans.
• Draw exterior and interior elevations.
• Draw sections and details.
• Develop site plans.
• Apply building code principles.
• Create renderings and design visualizations.
• Develop a complete set of construction drawings.

TEDR 1125 Structural Design **4 Credits / 120 Clock-Hours**

This course will cover concepts and principles of building design through parametric 3D models and construction documentation. This course explores the tools necessary to create, document, and print parametric structural models and integrates Building Information Modeling (BIM) is integrated into all processes.

Objectives:
• Create levels, grids and/or views.
• Change and modify elements.
• Create columns, walls and/or foundations.
• Explain structural reinforcement.
• Create beams, bracing and/or framing.
• Create floors, shafts and/or stairs.
• Apply annotation, details and/or schedules.

TEDR 1145 Architectural Rendering **3 Credits / 90 Clock-Hours**

This course provides basic information about creating interior and exterior designs of architectural models. This course will provide instruction on how to view and navigate within the provided 3D architectural model, managing and creating materials and develop spaces with walls, doors and windows, model floor finishes, ceilings with soffits, casework, custom furniture, restrooms, and light fixtures. Finally, projects in this course will utilize advanced 3D architectural software, photorealistic rendering, and physical models using advanced manufacturing equipment (laser cut materials and 3D printers).

Objectives:
• Identify materials and their usage.
• Create floor and wall finishes.
• Create ceilings with soffits.
• Develop with curtail walls.
• Design stairs and railings.
• Create casework.
• Use furniture and lighting fixtures.
• Create real and artificial lighting.
• Create advanced building models.
• Develop building laser cut and 3D printed models.

TEDR 1220 Production Drafting **4 Credits / 120 Clock-Hours**

The Production Drafting course makes use of CAD to create industry level production working drawings. Students will learn and use the latest American Society of Mechanical Engineers (ASME) Y14.5 standards for Geometric Dimensioning & Tolerancing (GD&T).

Objectives:
● Apply general tolerancing.
● Identify GD&T symbols.
● Define GD&T terms.
● Establish datums, material conditions, and boundaries.
● Recognize geometric characteristics.

TEDR 1255 Engineering Drawings **4 Credits / 120 Clock-Hours**

This course explores the basic information necessary for creating professional drawings in the engineering world. This course will present basic instruction in preparing working drawings using 3D CAD methods, help build the necessary technical skills to communicate engineering drawing ideas in an understandable, efficient, and accurate manner as well as introduce Geometric Dimensioning & Tolerancing (GD&T).

Objectives:
• Develop sheets and/or views.
• Apply dimensioning methods.
• Apply annotation application.
• Develop sheet formats and/or templates.
• Develop assembly drawing views.
• Develop bill of materials and/or tables.
• Recognize performance and/or display issues.
• Develop drawing references and/or comparison.
• Recognize GD&T processes and/or symbols.
• Apply GD&T to working drawings.

TEDR 1270 Metal Processes **3 Credits / 90 Clock-Hours**

This course will explore principles and techniques of some of the metal manufacturing processes such as sheet metal and weldments. The first area of focus will be the fundamental skills and concepts used to build sheet metal parts and flat pattern layouts. The second area of focus will be the fundamental skills and concepts used to build weldment parts.

Objectives:
• Create sheet metal parts using the flange and convert methods.
• Create multibody sheet metal parts.
• Produce flat pattern developments.
• Create sheet metal parts using forming tools.
• Create structural members using weldments.
• Create pipes and tubing.
• Produce working drawings involving weldments.

TEDR 1275 Milling Machining **3 Credits / 90 Clock-Hours**

This introductory manufacturing course makes use of the combination of 3D printed solid models and a CNC milling machine. Training includes the design of multiple parts that will need milling refinement for completion, the design and 3D printing of clamps that will mount into the mill, securely fasten each different 3D printed model and basic training of the milling process.

Objectives:
• Design 3D models that will need further refinement.
• Design 3D models that will secure designed parts in mill.
• Run programs created for the milling of each designed part.

TEDR 1280 Surface Modeling **2 Credits / 60 Clock-Hours**

This course will explore how to build freeform shapes using engineering CAD software, the difference between solids and surfaces, appropriate usage of surfaces, continuity, general workflow, industry applications of surface models as well as basic and advanced modeling techniques.

Objectives:
• Distinguish the difference between solids and surfaces.
• Identify continuity.
• Demonstrate efficient workflow with surfaces.
• Create basic surface models.
• Create hybrid models.
• Repair surface geometry.
• Use advanced surface tools.
• Create blends and patches.
• Demonstrate use of surfaces in various industries.

TEDR 1310 Civil Design **4 Credits / 120 Clock-Hours**

The Civil Design course will teach more advanced concepts needed in civil drafting through 3D civil design software. Using Civil 3D, students will be able to analyze existing workflows and make changes to improve performance based on the tools and features that are learned and practiced in this course.

Objectives:
• Identify and work with object styles.
• Create, manage, and apply label styles.
• Manage points, and work with point groups.
• Create and edit alignments.
• Define and edit parcels.
• Create and edit profiles and profile views.
• Create corridors and extract information from them.
• Create pipe networks and edit them in plan and profile.
• Create sheets with the plan production tools.
• Manage grading tools.
• Identify and calculate volumes.
• Apply project data with data shortcuts.

TEDR 1320 Civil Surveying **3 Credits / 90 Clock-Hours**

The Civil Surveying course equips technicians with the basic knowledge required to use land-surveying software. Students will learn how to import converted survey data into a standardized environment and to use the automation tools to create an existing conditions plan and topography surface.

Objectives:
- Identify points overview and styles.
- Manage points and coordinate transformations.
- Create points and drafting.
- Create point groups and reports.
- Manage point security and editing.
- Identify survey networks.
- Manage surfaces.
- Apply surface editing.
- Apply surface labels and analysis.

TEDR 1330 Civil Geographic Information System **4 Credits / 120 Clock-Hours**

This course covers Geographic Information Systems (GIS) and manipulating related information within industry standard software. This course will explore how to capture, analyze, manipulate, manage, and present all types of geographical data as well as working project from initial ideas to design presentation. This course will explore concepts related to data driven maps (digital and printed presentational material), interactive web maps, the use of Global Positioning System (GPS) and information gathering systems.

Objectives:
- Evaluate, preview, and/or study project area.
- Create data from various information sources.
- Import data from various information sources.
- Edit data.
- Analyze data.
- Create a digital, interactive, and printed map displaying the analysis and information.
- Present analysis results.
- Use GPS and information gathering tools and hardware.

TEDR 2100 Advanced BIM **4 Credits / 120 Clock-Hours**

This course will explore how Building Information Modeling (BIM) is an approach to the entire building life cycle and focus on how systems need to coordinate, update, and share design data with team members throughout the design construction and management phases of a building's life. This course will further explore a company foundation for BIM focused designs by developing standard templates and custom elements. This course will cover how to use models (architectural specific families, MEP specific families, and structural specific families) in a commercial project and incorporate all aspects of development and design.

Objectives:
• Integrate Building Information Modeling (BIM).
• Create custom templates that include annotation styles, preset views, sheets, and schedules.
• Create schedules and understand their relation to BIM.
• Create material takeoff schedules.
• Create custom wall, roof, and floor types.
• Create casework.
• Create custom system families.
• Create industry specific families.
• Use parametric family geometry, profiles, and annotations.

TEDR 2105 BIM Coordination **3 Credits / 90 Clock-Hours**

This course covers the concept of Building Information Modeling (BIM), which encompasses the entire building life cycle. BIM includes all phases of the design process, from model creation to construction and ending at operations and maintenance. This course will use a BIM workflow to explore how to do design changes throughout the BIM process and how those changes affect the BIM model. This course will explore how to consolidate civil, architectural, structural, and MEP models into one BIM model. This course will cover topics on how to use review and markup tools for communicating issues across disciplines, how to simulate construction as well as finding constructability issues and on-site clashes.

Objectives:
• Recognize the purpose of BIM.
• Apply BIM.
• Consolidate models.
• Review models.
• Analyze models.
• Develop communication of the models.
• Collaborate with Team Members for Clash Solutions.
• Animate construction timelines.

TEDR 2120 Structural Steel Detailing **3 Credits / 90 Clock-Hours**

This course covers topics such as the fundamentals of structural design, structural steel detailing of beams, columns, braces, marking and numbering systems, bill of materials, welding symbols, and construction drawings to AISC standards. This course explores the use of CAD software to create drafted 2D drawings.

Objectives
• Explain steel and/or concrete construction techniques
• Create structural steel detailing and/or concrete detailing
• Identify steel shapes and/or applications
• Identify connection types
• Create structural steel manufacturing drawings
• Create a bill of materials (BOM) and various schedules
• Identify job specifications
• Identify and use industry standards

TEDR 2180 Architectural Standards **4 Credits / 120 Clock-Hours**

This course provides the basic information necessary for development of residential and light commercial (Type IV and V buildings) architectural design and construction documents. This course will also serve as a reference for design and construction principles and methods. It is intended to help build the necessary technical skills to communicate architectural ideas in an understandable, efficient, and accurate manner. Students will be assessed through a series of quizzes, visual identification exercises, and comprehensive assessments.

Objectives
• Explore careers in Architecture, Engineering, or Construction (AEC).
• Demonstrate the application of various guidelines and codes.
• Apply ADA requirements.
• Understand floor plan requirements.
• Determine plot plan needs and requirements.
• Understand footing and foundation requirements.
• Understand sill, floor, wall and ceiling construction.
• Understand door, window and stair construction.
• Understand roof details and elevation views.
• Understand electrical, plumbing and climate control requirements.

TEDR 2181 Commercial Standards **4 Credits / 120 Clock-Hours**

This course provides the basic information necessary for the development of commercial architectural design and construction documents. This course will also serve as a reference for design and construction principles and methods. It is intended to help build the necessary technical skills to communicate architectural ideas in an understandable, efficient, and accurate manner. Students will be assessed through a series of quizzes, visual identification exercises, and comprehensive assessments.

Objectives:
• Explore careers in Architecture, Engineering, or Construction (AEC).
• Demonstrate the application of various guidelines and codes.
• Apply ADA requirements.
• Understand floor plan requirements.
• Determine plot plan needs and requirements.
• Understand footing and foundation requirements.
• Understand sill, floor, wall and ceiling construction.
• Understand door, window and stair construction.
• Understand roof details and elevation views.
• Understand electrical, plumbing and climate control requirements.
• Understand building materials and specifications.

TEDR 2210 Photoshop for Interior Designers **3 Credits / 90 Clock-Hours**

This course will cover concepts and principles necessary to instruct students who have no experience in Photoshop. Step-by-step demonstrations that are easy to follow for beginning level learners are provided which instruct on the basic commands and functions of the program. The course covers pedagogical features that are designed to assist teaching and enhance learning.

Objectives:
• Teach visual communications and fundamentals.
• Instruct on the creation of floor plans, elevations, perspectives and isometric views.
• Apply materials, lighting, special effects and entourage.
• Create freehand and presentations drawings.

TEDR 2220 Mold Design **2 Credits / 60 Clock-Hours**

This course teaches procedures necessary for using parametric design tools to create and analyze effective mold designs. It will instruct through different tasks, from designing or repairing a mold, to developing complex parting lines, from making a core in the part mode to advancing through more complex tasks in the assembly mode. Every project is based on real world products. Each of these projects has been broken down and developed into simple, comprehensible steps.

Objectives:
• Provide existing users with in-depth knowledge of software mold making tools.
• Teaches analyzation of parts through plastics wizard and flow simulation.
• Introduces usage of surface tools to repair models for mold making.
• Use step-by-step instructions and projects based on real world products.

TEDR 2230 Machine Power Design **2 Credits / 60 Clock-Hours**

This course will explore modeling and principles of motion and power systems to create a complete working production set of drawings and movable assemblies. These systems include gear, sprocket, thread, fastener, bearing, bushing, spring, and cam creation.

Objectives:
• Produce different types of threads.
• Represent different types of threads.
• Identify different types of fasteners.
• Identify gear, cam, and other motion transfer systems.
• Apply industry standard dimensions to drawings.
• Apply industry standard tolerances and/or fits to drawings.
• Complete entire set of working drawings including proper dimension techniques.
• Create movable assemblies demonstrating full motion of the design.

TEDR 2240 3D Printing and Advanced Manufacturing **3 Credits / 90 Clock-Hours**

This final course explores 3D printing, advanced manufacturing techniques, and modern product design. Various technologies, equipment, model preparation, and general hardware maintenance will be covered. This course will explore how to disassemble, measure, and model all the pieces and parts that make up an approved assembly using CAD software and design changes will take advantage of advanced manufacturing techniques. This course will cover topics on how to use scanned sketches, 3D scanning, and traditional measurement tools. This course allows for team projects to expand the design beyond the abilities of a single drafter and incorporate design changes into the project. This course will focus on a design proposal, high quality product renderings, and the production of working drawings for each part and full assembly.

Objectives:
• Identify modern advanced manufacturing processes.
• Explain possibilities, suitability, and limitations of advanced manufacturing.
• Explain the use of solid, surface, and polygon modeling software packages.
• Explain the production of assemblies.
• Explain measuring using measuring devices.
• Explain the applicable use of 3D scanners.
• Produce a design proposal.
• Produce fully annotated multi-view drawings of parts.
• Produce an exploded assembly drawing including part identification, and a bill of materials.

Salt Lake

TEDR 1015 Applied Technical Math **1 Credit / 30 Clock-Hours**

The Applied Technical Math course includes introductions to geometry, algebra, and trigonometry as they apply to the drafting and design industry standards. Students will practice solving basic geometric, algebraic, and trigonometric equations.

Objectives:
● Solve equations using basic geometry.
● Solve equations using basic algebra.
● Solve equations using basic trigonometry.

TEDR 1025 Introduction to AutoCAD **3 Credits / 90 Clock-Hours**

Basic skills using AutoCad for drawing applications are taught. The course includes draw and modify commands, geometric construction, dimensions, templates, blocks and libraries, hatching, layers, scales, and plotting. Students will also be introduced to 3D CAD.

Objectives:
• Develop, use, and customize drawing templates.
• Use AutoCAD drawing, modification, and reproduction commands.
• Define dimensioning standards and apply them to drawings.
• Develop precision fits and apply them to drawings.
• Create assembly drawings that meet ANSI standards.
• Descriptive geometry, construction techniques and CAD drawing aids utilized in mechanical drawings.
• Demonstrate the creation and use of blocks and block libraries.

TEDR 1210 Mechanical Design **4 Credits / 120 Clock-Hours**

This course explores advanced mechanical design features including threads, fasteners, gears, cams, jigs, fixtures, and weldments. Concepts also include measuring techniques, types of fit and their function, and advanced working drawings.

Objectives:
• Identify measuring tools utilized in machine shops and production drawings.
• Produce different types of threads on drawings.
• Produce working drawings involving weldments.
• Produce drawings utilizing gears, cams, jigs, and fixtures.
• Identify different types of mechanical fasteners.
• Demonstrate methods used for injection molds.

TEDR 1310 Civil Design **4 Credits / 120 Clock-Hours**

The Civil Design course will teach more advanced concepts needed in civil drafting through 3D civil design software. Using Civil 3D, students will be able to analyze existing workflows and make changes to improve performance based on the tools and features that are learned and practiced in this course.

Objectives:
• Identify and work with object styles.
• Create, manage, and apply label styles.
• Manage points, and work with point groups.
• Create and edit alignments.
• Define and edit parcels.
• Create and edit profiles and profile views.
• Create corridors and extract information from them.
• Create pipe networks and edit them in plan and profile.
• Create sheets with the plan production tools.
• Manage grading tools.
• Identify and calculate volumes.
• Apply project data with data shortcuts.

TEDR 1320 Civil Surveying **3 Credits / 90 Clock-Hours**

The Civil Surveying course equips technicians with the basic knowledge required to use land-surveying software. Students will learn how to import converted survey data into a standardized environment and to use the automation tools to create an existing conditions plan and topography surface.

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- Manage point security and editing.
- Identify survey networks.
- Manage surfaces.
- Apply surface editing.
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TEDR 1330 Civil Geographic Information System **4 Credits / 120 Clock-Hours**

This course covers Geographic Information Systems (GIS) and manipulating related information within industry standard software. This course will explore how to capture, analyze, manipulate, manage, and present all types of geographical data as well as working project from initial ideas to design presentation. This course will explore concepts related to data driven maps (digital and printed presentational material), interactive web maps, the use of Global Positioning System (GPS) and information gathering systems.

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- Evaluate, preview, and/or study project area.
- Create data from various information sources.
- Import data from various information sources.
- Edit data.
- Analyze data.
- Create a digital, interactive, and printed map displaying the analysis and information.
- Present analysis results.
- Use GPS and information gathering tools and hardware.

TEDR 1400 Introduction to Engineering and Design **3 Credits / 90 Clock-Hours**

An introduction to Electronics, Manufacturing, Product Design, Machining, CAD and the design process. Students will learn to read blueprints and use design tools to create and demonstrate Orthographic Projection, Section views, Dimensioning, Sketching, Assembly drawings, Tolerancing and Fasteners.

Objectives:
• Create basic orthographic projection drawings.
• Apply basic dimensions to drawings.
• Demonstrate correct sketching techniques.
• Create section views and apply dimensions correctly.
• Create basic design and working drawings.
• Interpret and apply basic tolerancing.
• Define terminology related to fasteners.
• Define geometric construction techniques.
• Explain to fundamentals of electronics, manufacturing, and machining technology.

TEDR 1410 Engineering Graphics **3 Credits / 90 Clock-Hours**

Comprehensive applications of 3D CAD-based national (ANSI/ASME) & international ISO) graphics standards, including coordinate & geometric dimensioning and tolerancing. Introduction to Engineering & Technical design solutions related to STEM industries.

Objectives:
• Create and fully constrain sketches using both dimensional and geometric constraints.
• Create 3D model features from sketches using extrude, revolve, cut extrude, sweep loft etc.
• Create 3D model-based features using holes, fillets, blends, chamfers, shell.
• Create multiple 3D model-based features using patterns, arrays, and mirror techniques.
• Create multiple configurations, both manually and using design tables.
• Demonstrate ability to analyze and determine design intent.
• Create 3D CAD solid model components of basic complexity to semi complex mechanical components.
• Create 3D solid model assemblies from multiple different components using dimensional, geometric and mechanical mating constraints.
• Create, read, and understand engineering drawings composed of multiple views.
• Measure and analyze 3D solid models.

TEDR 1420 Electronics Drafting **3 Credits / 90 Clock-Hours**

Drafting and design techniques used in the electronics industry including electronics symbols, schematic and logic diagrams, electro-mechanical design, printed circuit board design, artwork layout, and related industry standards. Students will be using PADS which is a circuit board layout software package
and AutoCAD.

Objectives:
• Define material properties for metals, plastics, elastomers, ceramics, and composites.
• Apply proper procedure to create layouts for printed circuit boards.
• Create the detail, artwork and assembly drawings associated with printed circuit boards.
• Design layouts with vendor sheets for drawing package of electro-mechanical assemblies.
• Create connection and/or cable diagrams that meet current industry standards.

TEDR 1425 Altium Electronic Drafting **3 Credits / 90 Clock-Hours**

No description available.

TEDR 1430 Advanced 3D Modeling **3 Credits / 90 Clock-Hours**

Solid modeling with AutoDesk Inventor will be taught. Topics include sketch planes, part construction, extraction of engineering data, assemblies and mating parts, parametric design and related drawings. The Design Center will also be used.

Objectives:
• Develop geometry for solid parts using sketch tools.
• Apply basic 3D modeling commands to create models.
• Practice and utilize parametric modeling functions.
• Utilize advanced modeling tools.
• Create assembly drawings from detail parts.
• Produce 2D orthographic detail and assembly drawings from solid models.

TEDR 1435 Product Design Fundamentals 3D Printing **3 Credits / 90 Clock-Hours**

Product Design is the process of applying principles, experience, and judgment to
the development of a technical product to meet a need. Turning ideas into a design,
develop detailed part and assembly drawings, implementation, and evaluation will incorporate problem identification.
Sketching, gears/cams/shafts, Tolerances, rapid prototyping, and additive manufacturing concepts will be presented.

Objectives:
• Demonstrate ability to create parts using a 3-D software package.
• Practice importing parts using the content libraries.
• Use the design process when creating a part or assembly.
• Define and apply different drive mechanisms to an assembly.
• Apply correct constraints when creating a part and an assembly.
• Use rapid prototyping equipment to print your final project.
• Apply advanced dimensioning to a part to meet different standards.

TEDR 1440 Schematic Capture **3 Credits / 90 Clock-Hours**

No description available.

TEDR 1450 Robotics in the World **3 Credits / 90 Clock-Hours**

No description available.

TEDR 1460 Geometric Dimensioning and Tolerancing **3 Credits / 90 Clock-Hours**

The use of CAD to create industrial level production working drawings. Includes the latest ASME Y14.5 standards for Geometric Dimensioning & Tolerancing. Topics of discussion will include general tolerancing, symbols and terms, datums, material conditions and boundaries, geometric characteristics, and positional tolerancing.

Objectives:
• Explain the basics of general tolerancing.
• Create drawings with symbols and terms which meet current standards.
• Explain and apply knowledge of datums.
• Explain terms that apply to material conditions and material boundaries.
• Use geometric characteristics to help define modeled parts.
• Explain positional tolerancing and how it applies to a part.
• Use CAD to create professional level engineering drawings.

TEDR 1470 Manual Machine Shop **3 Credits / 90 Clock-Hours**

Basic machine shop theory including safety, setup and operation of lathes and mills, machine and tool performance, metrology, process planning, interpretation of engineering drawings, and an introduction to CNC equipment. Lab experience is included.

Objectives:
• Demonstrate industrial safety specific to the machine shop environment.
• Develop part design improvements for the manufacturability of an existing design.
• Determine the most economical steps to produce parts manufactured in the machine shop.
• Use SPC to determine the stability of a process.
• Carefully select and use metrology equipment found in a machine shop environment.
• Correctly operate manual lathes and mills.
• Use proper machine shop terminology.
• Calculate the cost of parts built in the machine shop.

TEDR 1475 CNC Programming **3 Credits / 90 Clock-Hours**

Basic CNC machine shop theory including G and M programming, operation, and performance of CNC lathes and mills. Lab experience is included.

Objectives:
• Demonstrate general safety precautions relating to machine shop procedures.
• Explain how CNC machines are used in Industry including.
• Demonstrate procedures for setting up and running “3 axis CNC mills” and “2 axis CNC lathes”.
• Explain and use manual CNC Programming.
• Describe the scope as well as the limits of parts designed to be fabricated using CNC machining.
• Demonstrate use of Computer Aided Manufacturing (CAM) using Feature CAM software.
• Use proper machine shop terminology.
• Calculate the cost of parts built in the machine shop.

TEDR 1480 Manufacturing Processes **3 Credits / 90 Clock-Hours**

A broad analysis of industrial materials and processes used in manufacturing as related to design. Topics include metal forming, casting, machining, non-metals, finishing and assembly, and the principles of material behavior.

Objectives:
• Test and validate material properties for metals, plastics, elastomers, ceramics, and composites.
• Explain material forming processes for rolling, spinning, bending, drawing, and forging.
• Create material casting processes for sand casting, investment casting, full mold casting, shell mold casting, permanent casting and centrifugal casting.
• Explain molding process for injection molding, blow molding, thin film blow molding, and rotational molding.
• Explain or demonstrate separating processes for punching, shearing, turning, milling, grinding. electro discharge machining, and electro chemical machining.
• Demonstrate conditioning processes for heat treating, annealing, tempering, case hardening, plating, and coating.

TEDR 1490 Product Design and Development CAD/CAM **3 Credits / 90 Clock-Hours**

Uses CAD to design and layout advanced production drawings. Uses CAM to create industry level CNC files for production. Uses industry standard reference materials, i.e., Machinery's or Engineers Handbook, ANSI and/or ASME Specifications, GD & T. Course supports the design, drafting, and fabrication for a student's capstone project.

Objectives:
• Create industry standard professional drawings.
• Create industry standard professional CNC programs.
• Identify mechanical engineer's role in an engineering and/or manufacturing organization.
• Identify manufacturing engineer's role in an engineering and/or manufacturing organization.
• Perform cost analysis that determines manufacturability of products.
• Develop ability to search for and interpret industry standard specifications. ANSI, ASME, ASTM.
• Test and validate designs using CAE simulation and actual functional testing.

TEDR 2020 Advanced AutoCAD **2 Credits / 60 Clock-Hours**

Advanced skills using AutoCAD. Includes: introduction to detail and assembly drawings, advanced geometric construction, isometric drawing, auxiliary views, advanced dimensioning, dynamic blocks with attributes, and AutoCAD 3D Modeling.

Objectives:
• Develop, use, and customize drawing templates and profiles.
• Use AutoCAD drawing, modification, and reproduction commands.
• Apply dimensioning standards and setups for different styles of dimensioning applications.
• Create drawings using proper views, and correct dimensioning procedures.
• Create assembly drawings from detailed parts.
• Use descriptive geometry, construction techniques, and CAD drawing aids utilized in mechanical drawings.
• Create and use blocks and block libraries in 2-D drawings.
• Use 3D modeling applications in AutoCAD.
• Input data from a legal description of a property into a CAD drawing.

USU - Eastern

TEDR 1003 Career and Workplace Relations **1 Credit / 30 Clock-Hours**

The Career and Workplace Relations course is designed to help students gain insight into how their skills and professionalism enhance relationships between management and coworkers. Instruction includes employment skills such as communication, critical thinking, professional etiquette, and team dynamics.

Objectives:
- Identify personal and transferable skills, competencies, and/or abilities.
- Create an industry specific resume, cover letter, thank you letter, reference list, and online presence.
- Demonstrate effective interviewing skills.
- Submit an application for an industry specific position.
- Demonstrate effective use of job search websites.

TEDR 1015 Applied Technical Math **1 Credit / 30 Clock-Hours**

The Applied Technical Math course includes introductions to geometry, algebra, and trigonometry as they apply to the drafting and design industry standards. Students will practice solving basic geometric, algebraic, and trigonometric equations.

Objectives:
- Solve equations using basic geometry.
- Solve equations using basic algebra.
- Solve equations using basic trigonometry.

TEDR 1130 Commercial Drafting **3 Credits / 90 Clock-Hours**

This course covers commercial and structural design techniques using 3D parametric CAD software. This course will introduce the interface and basic building components of the software to create levels, grids systems, and various views. This course will introduce how linking a structural project with an architectural model provides efficient project updates between design teams. This course will focus on structural columns, walls, foundations, reinforcement, beams, framing systems, and basic Building Information Modeling (BIM) practices and applications.

Objectives:
- Demonstrate basic drawing and/or editing tools
- Identify levels and grids
- Create the necessary views
- Link an architectural model to a structural project
- Adding structural columns and/or walls
- Adding foundations and/or structural slabs
- Create structural reinforcement
- Create beams and framing systems
- Create construction documents
- Annotate construction documents
- Create detailing
- Create scheduling

TEDR 1220 Production Drafting **4 Credits / 120 Clock-Hours**

The Production Drafting course makes use of CAD to create industry level production working drawings. Students will learn and use the latest American Society of Mechanical Engineers (ASME) Y14.5 standards for Geometric Dimensioning & Tolerancing (GD&T).

Objectives:
- Apply general tolerancing.
- Identify GD&T symbols.
- Define GD&T terms.
- Establish datums, material conditions, and boundaries.
- Recognize geometric characteristics.

TEDR 1500 Construction Site Planning **2 Credits / 60 Clock-Hours**

This course provides the basic skills of interpreting, drawing, and utilizing recorded property descriptions while focusing on understanding how elements such as grade, easements, and setbacks contribute to residential design.

Objectives:
- List the different methods and classifications for property descriptions.
- Interpret recorded property descriptions.
- Identify the required codes and descriptions necessary for construction approval.
- Create a complete residential site plan.

TEDR 1510 Construction Materials, Methods, and Design **3 Credits / 90 Clock-Hours**

This course covers the use of different fasteners, specific carpentry tools, blueprint interpretation, material estimation, basic floor construction, wall building with windows and doors, gable and hip roof systems, calculating stair riser and tread lengths, and cutting stair stringers.

Objectives:
- Describes building materials used in construction work.
- Identify hand tool and power tool operations, with care and maintenance.
- Define techniques for reading and using construction drawings and specifications.
- Model procedures for framing floor, wall, roof and stair systems and proper installation of doors and windows.
- Define the concept of the building envelope and its components.

TEDR 1520 Advanced Design Concepts **3 Credits / 90 Clock-Hours**

This course covers interior and exterior architectural model design. Instructing in 3D model navigation, material and space management, building elements, and lighting. It also includes advanced 3D software, rendering, and physical model creation with laser cutting and 3D printing.

Objectives:
- Create advanced plans for interior finishing and planning.
- Design stairs and railings identifying the code requirements between residential and commercial.
- Develop building laser cut and 3D printed models.

TEDR 1530 Design for Manufacturing **3 Credits / 90 Clock-Hours**

This course comprehensively surveys manufacturing methods, including additive, subtractive, and more. Explore different techniques used in modern manufacturing processes, understand their advantages and limitations, and gain insights into selecting the suitable method for specific design and production needs.

Objectives:
• Analyze the various methods of manufacturing.
• Design projects specifically for the different types of manufacturing.
• Discuss the materials properties that are suitable for products.

TEDR 1540 Manufacturing Principles **2 Credits / 60 Clock-Hours**

This course teaches manufacturing principles, materials, and essential fabrication elements. Gain knowledge in fundamental manufacturing techniques, materials selection, and fabrication processes. Learn how to apply these principles to create functional and efficient products through hands-on projects and practical exercises.

Objectives:
• Create a basic construction schematic for a project that will be constructed in-class.
• Analyze and generate a build list of essential items for the construction of projects.
• Utilize hand and power tools to construct projects as part of a team.

TEDR 1100 Residential Drafting **3 Credits / 90 Clock-Hours**

The Residential Drafting course serves as an introduction to residential design and explores emerging CAD tools to design a code-compliant home. Students will learn about residential materials and methods of construction to prepare construction documents that align with industry standards.

Objectives:
● Describe the function of architectural drawings.
● Define terminology and processes related to residential design and construction.
● Explore form, function, and sustainability in design and construction.
● Identify areas for review and iteration through redlining.
● Create a set of code-compliant construction documents.
● Explain the need for and apply the ADA (Americans with Disabilities Act) in design.

TEDR 1110 Introduction to Building Information Modeling **3 Credits / 90 Clock-Hours**

The Introduction to Building Information Modeling course teaches 3D architectural tools to explore Building Information Modeling (BIM). Students will demonstrate their learning of architectural drafting skills including architectural detailing and methods of construction to prepare architectural documents that align with industry standards.

Objectives:
• Use 3D modeling to communicate design intent.
• Create architectural documents.
• Explain the importance and purpose of BIM.
• Quantify model information.

TEDR 1200 Parametric Solid Modeling **3 Credits / 90 Clock-Hours**

The Parametric Solid Modeling course explores parametric solid modeling, a process of feature and dimension driven design, for the creation of basic models. Students will learn about model/drawing association, best modeling practices, and industry standards.

Objectives:
- Use commands and modeling strategies to create solid model parts and assemblies.
- Define terminology and processes related to parametric modeling.
- Develop drawings from created models.
- Interpret engineering design intent.
- Identify areas for review and iteration through redlining.

TEDR 2200 Advanced Solid Modeling **3 Credits / 90 Clock-Hours**

The Advanced Solid Modeling course explores parametric modeling techniques for creating complex models and assemblies. Students will learn about advanced tools and design methods.

Objectives:
- Create multi-body parts.
- Develop sheet metal parts and drawings.
- Use 3D sketches to model parts and assemblies.
- Apply surface drafting techniques.
- Use tables to formulate equations for manual calculations.
- Create equations, global variables, and configurations to design parametric models.

TEDR 1300 Civil Drafting **3 Credits / 90 Clock-Hours**

The Civil Drafting course will teach the basic skills and concepts needed to design land development projects including concepts related to civil engineering and surveying in general. This course will provide a solid foundation that can be used to perform basic civil design tasks to organize project data, work with points, create and analyze surfaces, model road corridors, create parcel layouts, perform grading and volume calculations, and layout pipe networks.

Objectives:
- Create and edit parcels and print parcel reports.
- Create points and point groups and work with survey figures.
- Create and manage styles and label styles.
- Create, edit, view, and analyze surfaces.
- Create and edit alignments.
- Create data shortcuts.
- Create sites, profiles, and cross-sections.
- Create assemblies, corridors, and intersections.
- Create grading solutions.
- Create gravity fed and pressure pipe networks.
- Perform quantity takeoff and volume calculations.
- Use plan production tools to create plan and profile sheets.

TEDR 2800 Capstone Project **3 Credits / 90 Clock-Hours**

The Capstone Project course applies program-acquired skills and knowledge through a comprehensive student-defined project, culminating in a practical demonstration of expertise in drafting. Students will navigate project management, integrating analysis and iteration.

Objectives:
• Develop a project scope.
• Establish clear and achievable objectives.
• Schedule a workflow.
• Develop quality, professional-level drafts that align with objectives.
• Manage project milestones professionally.
• Present completed project.