***Program Review Construction Technology Management***

***Program***

**SECTION 1 –OVERVIEW:**

***Narrative***

Program reviews were performed in various areas of the Construction Department in the past according to the adopted program review schedule with the last program review in 2013. The recommendations were noted and moved forward when able based on budgetary or staff availability to do so. This program review encompasses the entire construction area. The work started in February of 2016 and involved individual meetings with construction department faculty and staff as well as focused team meetings where time was set aside to come together as a group to review collected data and other supporting documents.

The Construction Technology Management (CTM) programs are designed to prepare students for direct employment into the construction trades and to transfer to 4 year university Construction Management programs as well as working with county-wide High Schools (HS) to offer dual enrollment and CAVIAT classes designed to provide HS students the basic skills for the construction industry. The department also provides support to noncredit trainings hosted by Coconino Community College. Students completing various courses in the department can earn varying industry standard certifications.

The construction department is a strong community partner. The full time faculty member sits on various committees throughout the community including Willow Bend Environmental Education Center (Board of Directors), Sustainable Economic Development Initiative, and the Coconino County Sustainable Citizens Advisory Committee. The department also participates in many public education events for the college including Willow Bend educational presentation for K- 12, Earth Day, Flagstaff Home and Garden Show, and NAU’s Tribal Photovoltaic Workshop. The construction department has also coordinated and offered noncredit training including photovoltaic training at Zion and Grand Canyon National Parks, weatherization training in Kingman, Tubac, and First Mesa, Retrofit training in Flagstaff historic buildings including the Weatherford Hotel, Greenhouse building for Puente de Hozho Elementary School, Certified Apartment Maintenance Training in Flagstaff in partnership with Goodwill of Northern Arizona and The Coconino County Career Center.

***Program Mission Statement***

The Construction Department provides high quality theoretical and hands on training to meet the employment and transfer education needs for the students of CCC and the employment needs of business and industry.

***Staffing of the program***

Currently there is one full time and two part-time faculty members in the program at CCC. The full time faculty member teaches 30 credit hours per year. In addition, this person also recommends the hiring of part time faculty, articulation of CTM, AUT, and WLD dual enrollment instructors at the high school, provides college representation on several community councils, supervises the part time shop assistant, and manages the construction shop at the Fourth Street Campus and Technology Center. He also coordinates noncredit offerings in the department.

***Decision making***

The CTM program has been in existence since 1993. Over the years, the department has included several different topic areas including construction, drafting, welding, automotive, aviation, agriculture, and apprenticeships in construction, sheet metal, and electrical trades. The program has provided training in the credit and noncredit arenas. The initiatives undertaken within the program have been to provide training in the construction trades areas that provide students with transfer opportunities as well as skills training for direct employment. Currently the department includes construction, basic automotive, and welding courses.

The program has maintained an advisory council since its inception that meets twice per year to review curriculum, create internship opportunities, and to discuss upcoming training needs and trends in the industry. Members of the council represent the construction trades and partnering educational agencies.

***Summary of student assessment results since last program review and programmatic changes as a result of the assessment results.***

Course success rates in the CTM area are high. The 2011-2014 data on course success rates was and overall average of 92%. Despite this high average, the CTM department faculty constantly review learning methods and areas for improvement to enable students to comprehend and learn the information in a better way.

The department uses skills check sheets to track student mastery of skill areas in the learning outcomes. Grading rubrics are also used in some classes and are distributed as part of the syllabus. See appendix A for examples.

***A statement of the program’s accomplishments in support of the College’s current strategic plan.***

Goal 1 of the 2016-2020 Strategic Plan states that Coconino Community College “will provide learners educational opportunities that are accessible and affordable, while also being economically feasible for the college.” Among the groups targeted are underserved populations. The goal of the strategic plan is to increase enrollment numbers in targeted underrepresented groups. The construction department helps meet this Strategic Plan Goal by providing the ability for students to affordable attain skills that lead directly to employment.

***A description of the current facilities needed to conduct the program, including space and equipment.***

Currently the CTM department holds credit and noncredit classes in the classrooms and construction lab at the Fourth Street Campus and Technology center. This lab is managed by the full time faculty member. The department also rents space at Flagstaff High School for the welding courses and Coconino High School for the automotive classes. The department also has a mobile training trailer purchased through funds made available by the American Recovery and Reinvestment Act of 2009.

**SECTION 2- TEACHING AND LEARNING:**

***Program requirements and course offerings***

The Coconino Community College Catalog provides information about the courses and programs in the Construction department. Course prerequisites are laid out in the catalog. What follows is a review of the course and program descriptions in the college catalog.

**Automotive (AUT):**

**AUT 100 and 106 currently offered. The rest are dual enrollment courses.**

**AUT 100 (3) Automotive Basics.** Basic automotive knowledge as it relates to owner and operator of an automobile or light truck. It will give the student an understanding of systems and maintenance. Two lecture. Two lab.

**AUT 106 (3) Automotive Engines.** An overview of the design, operation, diagnosis and service procedures of modern automotive engines. Students participate in the disassembly, inspection and reassembly. Service and technical data are presented to prepare the students for practical experience in engine servicing. Prerequisite: AUT 100 or Consent of Instructor. Two lecture. Two lab. May be Taken for S/U credit.

**AUT 107 (3) Automotive Engine Short Block Service Lab.** Laboratory experiences in engine service and rebuilding; specializing in valve train, cooling, lubricating, exhaust and intake systems. Pre/Co-requisite: \*AUT 106. Two lecture. Two lab. May be taken for S/U credit.

**AUT 108 (3) Automotive Engine Long Block Service Lab.** Continuing laboratory experience in engine service and rebuild; emphasizing the “long block” assembly. Students will disassemble, inspect and service the engine block for warpage, alignment and bore, service crankshaft, service camshafts and timing, service pistons and rods and service plugs, seals, covers, damper and flywheel. Prerequisite: \*AUT 107. One lecture. Three lab. May be taken for S/U credit.

**AUT 110 (3) Automotive Electrical and Electronic Systems.** A study of automotive electrical and electronic systems used on light and medium duty vehicles. Topics include Principles of Electrical/Electronic Systems, General Electrical System Diagnosis and Battery Diagnosis and Service. Pre/Co-requisite: AUT 100. Two lecture. Two lab. May be taken for S/U credit.

**AUT 111 (3) Automotive Electrical and Electronic Systems.** Emphasizes service of automotive and light truck starting and charging systems. Topics will include: Starting System Diagnosis and Repair, Charging System Diagnosis and Repair. Prerequisites: \*AUT 110. One lecture. Three lab. May be taken for S/U credit.

**AUT 112 (3) Automotive Electrical and Electronic Systems-Lighting and Accessories Systems Lab.** Emphasizes hands-on service of automotive and light truck lighting, gauge, horn, and other accessories systems. Prerequisite: \*AUT 111. One lecture. Three lab. May be taken for S/U credit.

**AUT 120 (3) Automotive Brake Systems.** A study of braking systems used on light and medium duty vehicles with an overview of heavy duty brakes (air) which will include theory, operation, construction, maintenance, testing, diagnosis and repair of drum and disc brakes. Pre/Co-requisite: AUT 100. One lecture . Three lab. May be taken for S/U credit.

**AUT 121 (3) Automotive Brake Systems Service Lab.** Emphasizes service of automotive and light truck brakes systems. Topics will include: Power Assist Units Diagnosis and Repair, Brakes Related (Wheel Bearings, Parking Brakes, Electrical, Etc.), and Antilock Brake and Traction Control Systems. Pre/Co-requisite: \*AUT 120. One lecture. Four Lab. May be taken for S/U credit.

**AUT 289 (1-6) Internship I.** Designed for students who are looking for paid or voluntary, practical learning experiences that apply academic and occupational education to real-life, on-the-job situations.  Credit hours will be negotiated based on fulfillment of a contract.  Each credit hour requires the completion of a minimum 45 hours of on-the-job participation.  Prior experience or course work in the field of interest is required.  One to six variable credit hours.  May be taken for S/U credit.

**Construction Technology Management (CTM):**

**CTM 111 (3) Plumbing.** This course will define the plumber’s responsibility and introduce the student to the plumbing trade. Topics include: plumbing plans, safety, plumbing materials and fittings, pipes joining techniques, drain-waste and vent systems, water supply systems, fixture installations and leak testing. Emphasis will be placed on safe operation of all trade tools and equipment and job site safety. Three lecture. May be taken for S/U credit with instructor approval.

**CTM 115 (3) Introduction to Woodworking.** Fundamental Woodworking Safety and Applications including basic Wood Shop Safety Precautions, Practices & Procedures . Basic wood working Project Design, Drawings , Materials calculation & Estimates. Basic Shop Procedures , wood preparation, joinery & jointing techniques. Emphasis on safe and proper use of Wood working hand tools, portable power and stationary power tools.  Lab three, Lecture one. May be taken for S/U credit with instructor approval.

**CTM 120 (3) Building the Human Environment.** Addresses architectural design and construction building practices, relating some of their psychological and environmental impacts. Historical, current and projected solutions to the human need for shelter and infrastructure is explored. Three lecture.

**CTM 122 (3) Construction Material & Equipment Safety.** This course will introduce the student to safety in the Construction Industry. Emphasis will be placed on safe operation of trade tools and equipment, job site safety and early hazard recognition. Topics covered include: early hazard recognition, safety plans, safe transport and handling of construction materials and equipment, scaffolding set-up techniques, trench shoring and safety, fall prevention planning and associated hazards. Three lecture.

**CTM 123 (3) Building Construction Methods I.** Floor foundations and interior and exterior framing, including various types and methods of building foundations and framing systems. Two lecture. Two Lab.

**CTM 124 (3) Building Construction Methods II.** Construction methods, materials, and safe working practices as they relate to carpentry framing with wood. Floor, interior and exterior walls, ceilings, and roof and stair framing are described. Window, door, insulation, drywall, flooring, roofing and cabinetry systems are described for residential construction. Prerequisite: CTM 123. Two lecture. Two Lab.

**CTM 130 (3) Blueprint Reading & Estimating.** Reading construction blueprint documents and estimating the amount of building materials needed for building projects. Reading and interpreting architectural schedules, symbols, and specifications. Three lecture.

**CTM 131 (1) Green Building Introduction.** Introduction to Green Building presents the Core Concepts and underlying reasons for approaching construction from a Sustainable methodology perspective.  Several Categories of Green Building are introduced and explored.  Categories include Building Site, Energy performance concepts & issues, Water Utilization, Indoor Environment, Materials resourcing and Recycling approaches.   Green Building myths are dispelled. Co-requisite: Construction experience. Recommended Co-requisite: CTM 123. One lecture. May be taken for S/U credit with instructor approval.

**CTM 132 (2) Solar Water Heater Workshop.** This course will describe the basics of heating domestic hot water via the sun. The basic parameters of solar design and system sizing will be described.  Various components of a solar water heating system will be described and each of there functions presented.  Several solar water heater systems diagrams will be presented, discussed, with advantages and disadvantages of each system discussed. The workshop will include hands-on disassembly of a flat plate collector and a “Batch Heater.  System pumps, differential controllers and heat exchangers will be shown in a shop setting.  A Batch solar water heater will be assembled from common materials in the shop using a hands-on approach. Recommended Prerequisite: CTM 111. One lecture . One Lab. May be taken for S/U credit with instructor approval.

**CTM 133 (1) Solar Greenhouse Design.** This course will lead students through basic passive solar design  for solar greenhouses.   Solar orientation, Home site evaluation and  Energy Efficient design  & Construction approaches will be considered for the architectural integration of the passive solar design and construction of a “solar” greenhouse. One lecture.

**CTM 134 (1) Rain Water Harvest Systems.** This class will introduce students to rain water as a source of water for domestic and/or landscape use. All system components for proper and safe use of rainwater will be presented and discussed . Components include: roofing materials, gutters and gutter sizing, first flush diverters and downspouts, plumbing piping to and from tank, tanks, water purification, filtration and analysis issues, sources of contamination, water pumps and control devices, water conservation fixtures, water conservation strategies for domestic and landscape use, guiding principles for water conservation, examples of rain water harvest systems will be shown. One lecture. One lab. May be taken for S/U credit with instructor approval.

**CTM 138 (1) Introduction to Solar Design Applications.** Basic introduction to the concepts and principles related to Solar Energy Applications.  A survey of the many ways that Solar Energy can be used in your home & life. One lecture. May be taken for S/U credit with instructor approval.

**CTM 139 (1) Greywater.** Don't let good "greywater" from tubs, sinks and washers do down the drain! Greywater re-use for landscape irrigation is safe and legal when done properly. In this class we'll explore greywater options, some simple, some more complex, including systems that when combined with use of composting toilets constitute affordable alternatives for people with difficult "perc" conditions. One lecture. May be taken for S/U credit with instructor approval.

**CTM 150 (3) Basic Electrical Theory.** Introduction to electrical theory , trade math,  Electrical theory & math.  Electrical safety and first aid,  Introduction to DC Theory & Batteries ,  AC theory,  Induction , Ohm’s Law , Series & parallel Circuit diagram & Schematics,  Wire Gauges,  Ampacity & Loads, Grounding & Bonding.  Prerequisite:  \*MAT 121  or \*MAT 122.Three lecture.  May be taken for S/U credit with instructor approval.

**CTM 151 (3) House Wiring I.** Basic Electrical theory and safety presented. Survey of electrical construction processes for residential applications. Determining materials, installation processes, safety, and code requirements of electrical construction will be emphasized and applied. Students will apply a variety of common residential receptacle and switch circuits in a shop practice setting. Two lecture. Two lab. May be taken for S/U credit with instructor approval.

**CTM 152 (3) House Wiring II.** Survey of electrical construction processes for residential applications. Determining materials, installation processes, safety, and code requirements of electrical construction will be emphasized and applied. Prerequisite: CTM 151 or Consent of Instructor. Two lecture. Two lab. May be taken for S/U credit with instructor approval.

**CTM 155 (4) Commercial Wiring I.** This class will emphasize Light Commercial Wiring Applications to determine sizes of service entrance conductors and feeders, conduit sizes and boxes, Transformer types, theory & sizing, and protection of transformers: referencing to the National Electric Code. Prerequisite: CTM 151 or Consent of Instructor. Three lecture. One lab. May be taken for S/U credit with instructor approval.

**CTM 211 (3) International Residential Code.** Safety principles of building construction under the Uniform Building Code, including structural requirements for wood, masonry, fire resistant materials and ratings, and occupancy requirements. Three lecture.

**CTM 224 (3) Concrete and Concrete Form Systems.** This course will provide instruction in structural and architectural applications of concrete. It will examine concrete chemistry, mix designs, placement and finishing methods, and forming systems. Two lecture; two lab.

**CTM 235 (3) Solar Home Design.** Alternative passive solar building techniques such as adobe, earth brick, rammed earth, sand bag, and earth ship will be presented, along with environmental and aesthetic design considerations. Prerequisite: CTM 120. Three lecture.

**CTM 236 (3) Photovoltaics and Wind Power.** This course will define the design and installation of photovoltaic and wind power systems. Emphasis will be placed on electrical safety and operation of trade tools and equipment and job site safety. Topics covered: photovoltaic and wind power system plans, safety, electrical materials and fittings, solar cell panel and wind generator wiring techniques, battery systems, inverters and charge controllers. Prerequisite: CTM 150. Three lecture.

**CTM 250 (3)  Innovative and Alternative Building Techniques.** Innovative and alternative building techniques such as steel framing, SIP, Integra or Rastra block, adobe, earth brick, rammed earth, cast earth, sand bag, papercrete, straw bale and earth ship will be presented along with environmental and aesthetic design considerations. These concepts will be integrated with a “pattern language” and passive solar design approach for student design projects. Recommended: CTM 123/124, CTM 235, CTM 120, or prior construction related experience. Three lecture; one lab. May be taken for S/U credit with instructor approval.

**CTM 253 (3) Plane Surveying and Building Layout.** Building layout and surveying to establish building location for excavation and for the accurate placement of the building foundation, including finish floor elevation. Three lecture.

**CTM 260 (3) Green Building I.** Principles of Sustainable Construction introduces the student to the principles and techniques of designing, building and maintaining more comfortable, energy-and-resource-efficient buildings from a Sustainable / Green Building categorical approach.  Prerequisite: CTM 235 and CTM 250. Three lecture. May be taken for S/U credit with instructor approval.

**CTM 270 (3) Contractor’s License.** Overview of construction business practices and government requirements designed to help the student prepare for obtaining a contractor’s license. Three lecture. May be taken for S/U credit with instructor approval.

**CTM 288 (3)  Construction Supervision and Scheduling.** Function of the construction site supervisor and the process used in scheduling, pre- and post-construction, communication techniques, and documentation of records and reports. Three lecture.

**CTM 289 (1–6) Internship I.** Designed for students who are looking for paid or voluntary, practical learning experiences that apply academic and occupational education to real-life, on-the-job situations.  Credit hours will be negotiated based on fulfillment of a contract.  Each credit hour requires the completion of a minimum 45 hours of on-the-job participation.  Prior experience or course work in the field of interest is required.  One to six variable credit hours.  May be taken for S/U credit with instructor approval.

**CTM 298 (1–6) Special Topics.** Designed to meet the needs of an individual(s) who has an interest in pursuing an original topic in an instructional area under faculty supervision.One to six variable credit hours.

**Welding Technology (WLD):**

**WLD 100 (2) Basic Welding.** Shop procedures, safety and personal protection.  Grinders, drill presses, and saws.  Resistance and oxyacetylene welders. Arc welders; alternating current (AC) and direct current (DC) modes, electrodes, positioning and securing.  Prerequisites:  Registered apprentice status with Northern Arizona Carpenters Joint Apprenticeship Training Committee or permission of the apprenticeship coordinator.  One lecture. Two lab.  May be taken for S/U credit.

**WLD 102 (3) Basic Welding Fabrication.** Fundamentals of basic arc welding procedures, equipment, and safety techniques. Various arc welding tasks in the flat, horizontal, vertical-up, and overhead positions. Two lecture; two lab.

**WLD 106 (3) Intermediate Welding.** Advanced arc welding procedures, equipment, and safety techniques. Instruction in the selection of electrode, gas, cups, and filler rod for gas tungsten arc weld (GTAW) welding. Techniques and practice in welding butt-joint, t-joint, lap and corner joints in various positions and numerous cutting procedures. Prerequisite: WLD 102 or consent of instructor. Two lecture; two lab.

**WLD 111 (3) Introduction to Artistic Blacksmithing.** This course provide an introduction to hand forging low carbon and tool steel, design, techniques, safe working habits, and methods used in blacksmithing. The class will include blacksmithing tools and processes, hammer control techniques, hand forging theory and metalworking practice.  Student Safety Equipment: Each student will be required to have suitable clothing: leather work boots above the ankle, cotton pants and shirts and some kind of cotton (welding) cap is suggested.  Prerequisites: Emancipated adult with manual dexterity, physical ability and mobility sufficient to accomplish course content. One lecture; three lab.  May be taken for S/U credit with instructor approval.

**WLD 289 (1–6) Internship I.** Designed for students who are looking for paid or voluntary, practical learning experiences that apply academic and occupational education to real-life, on-the-job situations.  Credit hours will be negotiated based on fulfillment of a contract.  Each credit hour requires the completion of a minimum 45 hours of on-the-job participation.  Prior experience or course work in the field of interest is required.  One to six variable credit hours.  May be taken for S/U credit.

**WLD 298 (1–6) Special Topics.** Designed to meet the needs of an individual(s) with interest in pursuing an original topic in an instructional area under faculty supervision. One to six variable credit hours.

**CERTIFICATES:**

**Environmental Technology: Alternative Energy: Intermediate and Advanced:** The Intermediate certificate is designed to introduce the student to the construction and electrical industries and provide the foundations for hazard recognition and safety design issues associated with home construction, community development and passive solar design. The Advanced certificate improves the student’s expertise and knowledge in construction from an economic perspective. This certificate advances electrical skills with particular applications in Photovoltaic and wind power electrical generation, and blueprint reading and drafting skills are developed.

Certificate Requirements: Intermediate & Advanced

1. Intermediate Certificate: 22 credit hours in:

CTM 111 Plumbing 3

CTM 115 Introduction to Wood Working 3

CTM 123 Construction Methods I 3

CTM 124 Construction Methods II 3

CTM 130 Blueprint Reading 3

CTM 138 Intro to Solar Applications 1

CTM 150 Basic Electricity 3

MAT 121 Intermediate Algebra (4) or higher math (3) 3

1. Advanced Certificate: 45credit hours in:

Completion of the Intermediate Certificate 22

CTM 120 Building the Human Environment 3

CTM 132 Solar Water Heating 3

CTM 133 Solar Greenhouse Design 1

CTM 151 House Wiring I 3

CTM 235 Solar Home Design 3

CTM 236 Photovoltaics and Wind Power 3

CTM 250 Innovative & Alternative Building Techniques 3

CTM 289 Service Learning 1

MAT 140 College Mathematics (5) or higher course (3) 3

**Construction Technology:** Provides the student with a technical foundation required to compete in today’s construction field. The student will be instructed through mastery learning components and field study workshops arranged with local contractors. Students may apply credit hours earned in this program toward the Associate of Applied Science degree in Construction Technology.

Program Requirements: 21 credit hours in:

CTM 120 Building the Human Environment 3

CTM 123 Building Construction Methods I 3

CTM 124 Building Construction Methods II 3

CTM 130 Blueprint Reading and Estimating 3

CTM 211 International Building Code 3

ENG 100 Fundamentals of Composition (4) or higher English course. 3

MAT 187 Pre-Calculus (5) or higher math course. (3) 3

**ASSOCIATE OF APPLIED SCIENCE DEGREES:**

**Environmental Technology: Alternative Energy Technician:** Will provide students with the skills to pursue a career in the Alternative Energy field. The student will be instructed through mastery learning components and field study workshops arranged with local contractors. Students may apply credit hours earned in the Construction Technology Certificate toward completion of the AAS degree.

Program Requirements: 61 credit hours in:

1. General Education: 25 credit hours: All courses for this area must be selected from AGEC categories.

Composition ENG 101 College Composition I 3

ENG 102 College Composition II 3

Mathematics MAT 140 College Mathematics (5) or higher 3

Arts/Humanities One course. 3

Social/Behavioral Sciences Two courses. 6

General Education Options CIS 120 Intro to Computer Info Systems 3

Physical/Biological Sciences One course. 4

1. Degree Core Requirements: 36 credit hours

CTM 111 Plumbing 3

CTM 115 Intro to Wood Working 3

CTM120 Building the Human Environment 3

CTM 123 Construction Methods I 3

CTM 124 Construction Methods II 3

CTM 130 Blueprint reading 3

CTM 132 Solar Water Heating 2

CTM 138 Intro to Solar Applications 1

CTM 150 Basic Electrical Theory 3

CTM 151 House Wiring I 3

CTM 211 International Residential Code 3

CTM 235 Solar Home Design 3

CTM 236 Photovoltaic and Wind Power 3

**Construction Technology:** Will provide students with the skills to pursue a career in the construction trades or in construction management. The student will be instructed through mastery learning components and field study workshops arranged with local contractors. Students may apply credit hours earned in the Construction Technology Certificate toward completion of the AAS degree.

Program Requirements: 60 credit hours

1. Arizona General Education Curriculum (AGEC) Requirements: 25 credit hours. All AGEC coursework must be selected from the approved AGEC list.
   1. Composition ENG 101 College Composition I 3

ENG 102 College Composition II 3

* 1. Mathematics MAT 140 College Mathematics (5) or higher. 3

* 1. Arts/Humanities Two courses. 6
  2. Social/Behavioral Two courses. 6
  3. Physical/Biological Sciences One course. 4

1. Degree Core: 24 credit hours

CTM 111 Plumbing 3

CTM 120 Building the Human Environment 3

CTM 123 Building Construction Methods I 3

CTM 124 Building Construction Methods II 3

CTM 130 Blueprint Reading & Estimating 3

CTM 150 Basic Electrical Theory 3

CTM 211 International Residential Code 3

CTM 288 Construction Supervision, Scheduling 3

and Project Management

1. Electives: 11 credit hours

Any 11 credits from BUS, CIS, CTM or WLD with a minimum of 3 credits in CTM.

**Sustainable Green Building:** Designed to educate students comprehensively on the many subjects related to green building categories and related environmental and occupant issues, energy efficiencies and sustainable building design considerations.

Program Requirements: 61 credit hours

1. General Education: 22 credit hours: All courses in General Education must be selected from the appropriate AGEC category.

Composition ENG 101 College Composition I 3

ENG 102 College Composition II 3

Mathematics MAT 140 College Mathematics (5) or higher. 3

Arts/Humanities One course. 3

Social/Behavioral Sciences Two courses. 6

Physical/Biological Sciences One course. 4

1. Degree Core: 39 credit hours

CTM 120 Building the Human Environment 3

CTM 123 Building Methods I 3

CTM 124 Building Methods II 3

CTM 130 Blueprint Reading and Estimating 3

CTM 131 Green Building Introduction 1

CTM 132 Solar Water Heater Workshop 2

CTM 133 Solar Green House Design 1

CTM 134 Rain Water Harvest Systems 1

CTM 138 Intro to Solar Design Applications 1

CTM 150 Basic Electrical Theory 3

CTM 235 Solar Home Design 3

CTM 236 Photovoltaics and Wind Power 3

CTM 250 Innovative and Alternative Building Tech 3

CTM 260 Green Building I 3

CTM 289 Internship I 3

ENV 111 Local Environmental Issues 3

or

ENV 113 Global Environmental Issues 3

**ASSOCIATE OF ARTS DEGREES:**

**Construction Technology Management:** Designed for transfer to the Construction Management bachelor’s degree at Northern Arizona University (NAU). Students completing this degree will transfer a minimum of 62 credits to NAU.

1. Program Requirements: 62 credit hours.
2. AGEC-A Requirements: 35 credit hours. All AGEC coursework must be selected from the approved AGEC list.

Composition: ENG 101 College Composition I 3

ENG 102 College Composition II 3

Mathematics: MAT 187 Pre-Calculus (5) or higher (3). 3

Arts/Humanities: Two courses from separate disciplines. 6

Social/Behavioral Sciences: BUS 214 Legal, Ethical and Regulatory Issues in Business 3

ECN 204 Macroeconomic Principles 3

Physical/Biological Sciences: PHY 111 College Physics I 4

PHY 112 College Physics II 4

Options: CIS 120 Introduction to Computer Information Systems 3

SPC 100 Fundamentals of Speech Communication 3

1. Degree Core Requirements: 27 credit hours

ACC 255 Principles of Financial Accounting 3

ACC 256 Principles of Managerial Accounting 3

CTM 120 Building the Human Environment 3

CTM 123 Building Construction Methods I 3

CTM 124 Building Construction Methods II 3

CTM 224 Concrete and Concrete Form Systems 3

CTM 253 Plane Surveying and Building Layout 3

ECN 205 Microeconomic Principles 3

MAT 160 Introduction to Statistics 3

**Vocational Technology Education** The Vocational Technology Education is program designed for transfer to the Bachelor of Science in Education in Career and Technical Education degree at Northern Arizona University (NAU) in the Industrial and Emerging Technologies area or Occupational Emphasis area. Students completing this degree will transfer 60-64 credits to NAU. Students planning to transfer to a university other than NAU should see an advisor. This degree results in an AGEC-A, which is transferable to all Arizona public universities.

Program Requirements: 60 credit hours

1. Arizona General Education Curriculum (AGEC) AGEC-A Requirements: 35 credit hours. All AGEC coursework must be selected from the approved AGEC list.
2. Composition ENG 101 College Composition I 3

ENG 102 College Composition II 3

1. Mathematics MAT 140 College Mathematics or higher. 3
2. Arts/Humanities Two courses from different disciplines. 6
3. Social/Behavioral Sciences POS 220 Arizona and National Constitution 3

1 additional course, excluding POS. 3

1. Physical/Biological Sciences Two courses. 8
2. Options Any AGEC coursework to complete 35 credit hours. 0-6
3. Elective Requirements: 25

Choose any 25 elective credit hours from any of the following areas:

AUT Automotive

CTM Construction Technology Management

WLD Welding Technology

Recommended: 4 credit hours of Internship I.

***The following table provided by Coconino Community College Institutional Research indicates multiple factors about course enrollment data for the past five years.*** Table 1 below has been split for this Program Review.

**Table 1 Enrollment as of Day 10 for each semester**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Columns |  |  |  |  |  |
|  | 2010-11 | | | 2011-12 | | |
| Courses | #Sec | #Enr | Tuition\* | #Sec | #Enr | Tuition\* |
| **AUT** | **4** | **68** | **$ 10,080** | **5** | **59** | **$ 8,466** |
| AUT 100 - Automotive Basics | 3 | 60 | $ 10,080 | 4 | 51 | $ 8,466 |
| AUT 106 - Automotive Engines | 1 | 8 | $ - | 1 | 8 | $ - |
| **CTM** | **31** | **363** | **$ 63,120** | **30** | **324** | **$ 61,752** |
| CTM 111 - Plumbing | 1 | 10 | $ 2,400 | 1 | 20 | $ 4,980 |
| CTM 115 - Intro to Wood Working | 3 | 31 | $ 4,080 | 3 | 31 | $ 6,474 |
| CTM 120 - Building the Human Environment | 1 | 26 | $ 6,240 | 1 | 22 | $ 5,478 |
| CTM 122 - Const Mats & Equip Safety | 1 | 7 | $ - | 2 | 6 | $ - |
| CTM 123 - Bldg Construction Methods I | 4 | 50 | $ 10,560 | 5 | 55 | $ 7,719 |
| CTM 124 - Bldg Construction Methods II | 1 | 19 | $ 4,560 | 2 | 16 | $ 3,237 |
| CTM 130 - Blue Print reading/Estimating | 1 | 19 | $ 4,560 | 1 | 17 | $ 4,233 |
| CTM 131 - Green Building Intro | 1 | 7 | $ 560 | 1 | 10 | $ 830 |
| CTM 132 - Solar Water Heating Systems | 1 | 6 | $ 960 |  |  |  |
| CTM 133 - Solar Greenhouse Design | 1 | 19 | $ 1,520 |  |  |  |
| CTM 134 - Rain Water Harvest Systems | 2 | 24 | $ 1,360 | 1 | 17 | $ 1,411 |
| CTM 138 - Intro to Solar Design Apps | 1 | 16 | $ 1,280 | 1 | 18 | $ 1,494 |
| CTM 150 - Basic Electrical Theory | 1 | 17 | $ 4,080 | 1 | 10 | $ 2,490 |
| CTM 151 - House Wiring I | 1 | 11 | $ 2,640 | 1 | 16 | $ 3,984 |
| CTM 211 - International Residential Code | 1 | 15 | $ 3,600 | 1 | 16 | $ 3,984 |
| CTM 221\*\* - Struct Design & Bldg Materials |  |  |  |  |  |  |
| CTM 221\*\*- Struct Design & Bldg Materials |  |  |  | 1 | 12 | $ 2,988 |
| CTM 224 - Concrete & Concrete Form Sys. |  |  |  |  |  |  |
| CTM 235 - Solar Home Design | 2 | 22 | $ 3,600 | 1 | 16 | $ 3,984 |
| CTM 236 - Photovoltaics & Wind Power | 2 | 27 | $ 4,800 | 1 | 14 | $ 3,486 |
| CTM 250 - Innov & Altern Bldg Techniques | 1 | 10 | $ 2,400 | 1 | 10 | $ 2,490 |
| CTM 253 - Plane Survey & Build. Layout | 1 | 7 | $ 1,680 |  |  |  |
| CTM 260 - Green Building I |  |  |  | 1 | 5 | $ 1,245 |
| CTM 288 - Construction Supervision/Sched |  |  |  |  |  |  |
| CTM 289 - Internship I | 4 | 20 | $ 2,240 | 4 | 13 | $ 1,245 |
| **WLD** | **15** | **172** | **$ 18,480** | **15** | **189** | **$ 19,422** |
| WLD 102 - Basic Welding Fabrication | 9 | 115 | $ 13,920 | 10 | 124 | $ 15,438 |
| WLD 106 - Intermediate Welding | 4 | 38 | $ - | 5 | 65 | $ 3,984 |
| WLD 111 - Intro to Artistic Blacksmith | 2 | 19 | $ 4,560 |  |  |  |
| **Grand Total** | **50** | **603** | **$ 91,680** | **50** | **572** | **$ 89,640** |

**\* Tuition Notes:**

**Dual Enrollment sections do not generate tuition revenues. See The Dual Enrollment tab for section details.**

**Tuition is based on in-state rates**

**Differential Tuition began 2014-15**

**\*\* CTM 221 - Struct Design & Bldg Materials was retired in Summer 2015**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |
| 2012-13 | | | 2013-14 | | | 2014-15 | | |
| #Sec | #Enr | Tuition\* | #Sec | #Enr | Tuition\* | #Sec | #Enr | Tuition\* |
| **4** | **58** | **$ 10,200** | **5** | **46** | **$ 8,091** | **3** | **25** | **$ 5,232** |
| 3 | 50 | $ 10,200 | 4 | 44 | $ 8,091 | 2 | 19 | $ 5,232 |
| 1 | 8 | $ - | 1 | 2 | $ - | 1 | 6 | $ - |
| **37** | **330** | **$ 56,610** | **38** | **256** | **$ 46,284** | **31** | **251** | **$ 60,291** |
| 1 | 10 | $ 2,550 | 2 | 9 | $ 2,349 | 2 | 12 | $ 3,564 |
| 6 | 49 | $ 4,590 | 4 | 47 | $ 5,220 | 4 | 39 | $ 9,801 |
| 1 | 21 | $ 5,355 | 1 | 14 | $ 3,654 | 1 | 18 | $ 5,346 |
| 2 | 19 | $ - | 3 | 8 | $ - | 1 | 4 | $ - |
| 7 | 54 | $ 6,885 | 5 | 37 | $ 7,047 | 5 | 48 | $ 12,177 |
| 2 | 21 | $ 3,570 | 5 | 22 | $ 4,176 | 3 | 25 | $ 6,831 |
| 2 | 24 | $ 6,120 | 1 | 12 | $ 3,132 | 2 | 21 | $ 6,237 |
|  |  |  | 1 | 2 | $ 174 | 1 | 2 | $ 198 |
|  |  |  | 1 | 13 | $ 2,262 | 2 | 13 | $ 2,574 |
| 1 | 10 | $ 850 | 1 | 12 | $ 1,044 | 1 | 12 | $ 1,188 |
|  |  |  | 1 | 6 | $ 522 | 1 | 8 | $ 792 |
| 2 | 21 | $ 1,785 | 1 | 13 | $ 1,131 | 2 | 15 | $ 1,485 |
| 1 | 17 | $ 4,335 | 2 | 15 | $ 3,915 |  |  |  |
| 1 | 7 | $ 1,785 | 2 | 9 | $ 2,349 | 1 | 7 | $ 2,079 |
| 1 | 8 | $ 2,040 | 1 | 7 | $ 1,827 |  |  |  |
|  |  |  | 1 | 7 | $ 1,827 |  |  |  |
|  |  |  |  |  |  |  |  |  |
| 1 | 7 | $ 1,785 | 1 | 4 | $ 1,044 | 1 | 8 | $ 2,376 |
| 1 | 9 | $ 2,295 |  |  |  | 1 | 7 | $ 2,079 |
| 1 | 14 | $ 3,570 | 2 | 12 | $ 3,132 |  |  |  |
| 1 | 13 | $ 3,315 | 1 | 4 | $ 1,044 |  |  |  |
| 1 | 8 | $ 2,040 |  |  |  | 1 | 7 | $ 2,079 |
| 1 | 6 | $ 1,530 |  |  |  | 1 | 2 | $ 594 |
|  |  |  |  |  |  |  |  |  |
| 4 | 12 | $ 2,210 | 2 | 3 | $ 435 | 1 | 3 | $ 891 |
| **18** | **201** | **$ 21,675** | **17** | **148** | **$ 20,358** | **3** | **27** | **$ 6,426** |
| 12 | 137 | $ 15,555 | 11 | 101 | $ 17,226 | 2 | 24 | $ 6,426 |
| 5 | 52 | $ 3,060 | 6 | 47 | $ 3,132 | 1 | 3 | $ - |
| 1 | 12 | $ 3,060 |  |  |  |  |  |  |
| **59** | **589** | **$ 88,485** | **60** | **450** | **$ 74,733** | **37** | **303** | **$ 71,949** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| 2015-16 | | | Total #Sec | Total #Enr | Total Tuition\* |
| #Sec | #Enr | Tuition\* |
| **6** | **66** | **$ 5,712** | **27** | **322** | **$ 47,781** |
| 4 | 58 | $ 5,712 | 20 | 282 | $ 47,781 |
| 2 | 8 | $ - | 7 | 40 | $ - |
| **40** | **321** | **$ 86,190** | **207** | **1845** | **$ 374,247** |
| 2 | 17 | $ 5,202 | 9 | 78 | $ 21,045 |
| 3 | 26 | $ 7,956 | 23 | 223 | $ 38,121 |
| 2 | 25 | $ 7,650 | 7 | 126 | $ 33,723 |
|  |  |  | 9 | 44 | $ - |
| 5 | 55 | $ 14,688 | 31 | 299 | $ 59,076 |
| 4 | 25 | $ 6,732 | 17 | 128 | $ 29,106 |
| 2 | 18 | $ 5,508 | 9 | 111 | $ 29,790 |
| 1 | 5 | $ 510 | 5 | 26 | $ 2,272 |
| 2 | 18 | $ 3,672 | 6 | 50 | $ 9,468 |
| 1 | 9 | $ 918 | 5 | 62 | $ 5,520 |
| 1 | 9 | $ 918 | 6 | 64 | $ 5,003 |
| 2 | 12 | $ 1,224 | 9 | 95 | $ 8,399 |
| 2 | 26 | $ 7,956 | 7 | 85 | $ 22,776 |
| 2 | 13 | $ 3,978 | 8 | 63 | $ 16,815 |
| 1 | 15 | $ 4,590 | 5 | 61 | $ 16,041 |
|  |  |  | 1 | 7 | $ 1,827 |
|  |  |  | 1 | 12 | $ 2,988 |
| 1 | 6 | $ 1,836 | 4 | 25 | $ 7,041 |
| 2 | 9 | $ 2,754 | 7 | 63 | $ 14,712 |
| 2 | 9 | $ 2,754 | 8 | 76 | $ 17,742 |
| 2 | 9 | $ 2,754 | 6 | 46 | $ 12,003 |
| 1 | 7 | $ 2,142 | 4 | 29 | $ 7,941 |
|  |  |  | 3 | 13 | $ 3,369 |
| 1 | 7 | $ 2,142 | 1 | 7 | $ 2,142 |
| 1 | 1 | $ 306 | 16 | 52 | $ 7,327 |
| **12** | **77** | **$ 17,202** | **80** | **814** | **$ 103,563** |
| 6 | 44 | $ 13,542 | 50 | 545 | $ 82,107 |
| 6 | 33 | $ 3,660 | 27 | 238 | $ 13,836 |
|  |  |  | 3 | 31 | $ 7,620 |
| **58** | **464** | **$ 109,104** | **314** | **2981** | **$ 525,591** |

Because this table had to be split to fit the page formatting an explanation is needed. Total enrolment in CTM, WLD, AUT Program, since its inception has resulted in the total tuition of $525,591. The student enrolment totals 2,981 individuals.

The following table breaks down the enrollment of the five years by program area with an additional breakdown that indicates total enrollment (total), dual enrollment (DE), and enrollment outside of dual enrollment (CCC).

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | CTM | |  |  | AUT |  |  | WLD |  |
|  | total | DE | CCC | | total | DE | CCC | total | DE | CCC |
| 2010/11 | 363 | 48 | 315 | | 68 | 26 | 42 | 172 | 95 | 77 |
| 2011/12 | 324 | 38 | 286 | | 59 | 25 | 34 | 189 | 111 | 78 |
| 2012/13 | 330 | 84 | 246 | | 58 | 18 | 40 | 201 | 116 | 85 |
| 2013/14 | 256 | 51 | 205 | | 46 | 15 | 31 | 148 | 70 | 78 |
| 2014/15 | 251 | 19 | 232 | | 25 | 9 | 16 | 27 | 9 | 18 |
| 2015/16 | 321 | 10 | 311 | | 66 | 49 | 17 | 77 | 30 | 47 |

A review of the 5 year enrollment history, without dual enrollment included, indicates the following: CTM enrollment experienced a drop in enrollment from 2010 to 2015, but is starting to trend upward. Automotive enrollment has been declining the last two years. Welding enrollment experienced a significant drop in 2014/15 due to the loss of the part time instructor in the fall of 2014 causing all sections to be cancelled. In the spring of 2015, an instructor was found and one section was offered. Since the courses are offered in the FUSD Flagstaff High School welding shop, a relationship must be formed between the FHS instructor and the CCC instructor in order to allow CCC to use the shop. The new instructor is working well with the FUSD instructor and therefore is continuing with CCC. This new relationship has allowed CCC to offer 2 sections of welding during the spring of 2016 thus increasing enrollment.

According to the U.S Bureau of Labor Statistics, the prediction for employment in construction related areas will increase from 2014 to 2024 (see table below). The construction industry is also on the list of industries with the largest wage and salary employment growth and decline with a prediction of a 1.2 percent growth from 2014 to 2024.

|  |  |
| --- | --- |
| Area | Percentage increase |
| Management Occupations | 5.5 |
| Building and grounds cleaning an maintenance occupations | 6.2 |
| Construction and extraction occupations | 10.1 |
| Installation, maintenance, and repair occupations | 6.4 |
| construction laborers | 12.7 |

***Have you observed that students regularly exit your program at a certain point prior to completion? If so, describe any patterns that you have observed.***

Most students in the construction program areas do complete or transfer to a four year institution.

***Credentialing***

Aside from the various certificates and degrees offered through CCC, students can also qualify to test for various industry credentials including OSHA 10, EPA 608, North American Board of Certified Energy Practitioners (NABCEP), Uponor PEX certification, and Building Performance Institute (BPI),

***How often are course outlines reviewed and updated?***

Program and course outlines are reviewed every year as part of the advisory council meetings. Modifications are made when indicated necessary due to university transfer or industry changes.

***Curriculum:***

Any changes in course or program outlines needed as indicated by the advisory councils have been put through the CCC curriculum process over the past 5 years.

***Articulation:***

CCC works with the NAU Construction department to maintain a 2 + 2 agreement that enables students to transfer from the AA in Construction Technology Management to the BS in Construction Management. Management. High school dual enrollment instructors are required to meet all CCC faculty credentialing and curriculum in order to teach dual enrollment classes.

***If applicable, is the program accredited by a programmatic accrediting agency? If so, name the agency and include the status of your most recent accreditation.***

N/A

***Teaching Loads:***

The one full time Faculty is responsible for teaching courses (annual load of 30 credits), developing curricula, and assessing learning outcomes in the assigned discipline. Responsible to oversee the implementation and growth of the CTM program. Responsible for management of the construction shop at the 4th street campus and the mobile training trailer. Also responsible for providing assistance and academic advising to students outside of regularly scheduled class time. Teaching assignments may include alternative delivery methods, day, evening and weekend classes, and may be at multiple sites. This is a full-time, benefits eligible, position.

***SECTION3 – Staff, Resources, Facilities, and Funds***

***Internal factors:***

***What do you see as internal strengths of the program?***

The construction department is a valuable training resource for HS students and the community stakeholders. The construction department is a valuable training resource for the community. Students indicate that the hands on training received is highly valuable and gives them confidence when entering the workforce. The shop, although a bit cramped, contains an amazing variety of training options across the construction trades. The department has an excellent reputation with the community and the instructors are sought for many professional input needs. The enrollment is relatively stable and strong.

***What do you see as internal weaknesses of the program?***

The greatest internal threat is the space limitation of the shop. Also, institutional restrictions limit opportunities to take the program out to the public.

***List the recommendations from your last program review and any recommendations from Program***

***Advisory Committees (if applicable).***

During the spring semester of 2013, the following programs underwent program review: Certificate and AAS degree in Alternative Energy Technology, Certificate and AAS degree in Sustainable Green Building, and the AAS degree in Construction Technology. Two major recommendations from the reviews were to continue review OSHA and other safety measures for the shop and equipment and continue marketing efforts that display the program to the community.

The advisory council meets twice per year. At the spring 2015 advisory council the recommendation was made to bring back training in AutoCAD.

**SECTION 4—ANALYSIS AND RECOMMENDATIONS**

**Description**:

In order to be safe competent worker in the construction fields a potential employee should attend a high level training program. Coconino County does not have trades school to provide this to it is imperative that CCC provides this training for the local workforce. Also, there are many individuals that seek the skills offered in the construction trades area in order to do their own projects and repairs. The courses, certificates, and degrees offered in the CTM area fulfill the community needs for job training and personal enrichment.

**Assessment:**

Skills check sheets and grading rubrics are utilized to assess skill attainment by students. Construction Programs do not comport themselves well to traditional Assessment Rubrics but in conjunction with the Assessment Committee we are working to develop Rubrics that have meaning to our courses and program. We do assess learning in our classes. An example of this is seen in Appendix A. One our program objectives is to improve our Assessment Processes.

**CTM, WLD and AUT:**

The Sustainable Green Building and Alternative Energy programs have won community awards due to the high quality and completeness of the program curriculum and level of training offered. The programs are unique for the state of Arizona. When the programs were first developed they were the first such offered programs in the state. The programs continue to be a model for other schools.

The construction programs are highly complimented in the hands on approach that is utilized in the training. Over the history of the program NAU has sought to have CCC provide the hands on training as they were not equipped to do so. Feedback on CCC students from employers is positive in skill attainment and job performance. Student who do internships are frequently offered full time employment at the internship location.

We offer both two year and certificate options for students interested in the construction trades. Also many courses serve as a standalone training in specific areas of construction. Students wishing to obtain profession level construction trades training have no other option outside of the college in Coconino County.

The program is strongly tied to the community through credit and noncredit training, community enhancing partnerships, internship placements, donations of equipment and materials from businesses and individuals.

*Appendix A Syllabi and skills check sheets*

**Coconino Community College**

**Course Syllabus**

**CTM 120 –** **Building the Human Environment – CRN 11267**

**Fall 2015**

Instructor’s Name: Ken Myers

Phone / E-mail: 526-7696 / kenneth.myers@coconino.edu

Class Schedule: Monday & Wednesday – 1:00 pm -2:15 pm

Office hours are posted on my office door

**Textbook & Required Materials:**

Textbook:

1. A Pattern Language: Oxford University Press, Inc

ISBN: 9780195019193

**COURSE DESCRIPTION AND GOALS**

This is an introduction to the ways in which architecture is influenced by cultural, environmental, physical and psychological need for the construction of shelter in the past, present and the future. It will focuses on architecture's response to “green” building methods, energy efficiency, climate, construction traditions and available resources, as well as the role of social, cultural, and economical developments.

The goal of this course is to allow students to experiment with various needs in the constructed environment. Students will learn to balance aesthetics with practical design considerations and the needs for environmentally conscious design principles. By examining historical and cultural perspectives, students will gain insights into current design and building practices.

Through a number of written and graphic design assignments, students will be asked to interact with the complex world of building the human environment.

Architecture, as an expression of art and function, featured architects include Phillip Johnson, Frank Lloyd Wright, Mary Jane Colter, & Paola Soleri.

**COURSE OUTCOMES**

1. Identify and explain architectural and building practices in the United States.
2. Identify cultural communities in terms of the residential structures within those communities and explain cultural and climatic influences as they impact residential dwellings historically, currently and in the future.
3. Determine what might comprise an ideal personal environment, justifying choices and subsequently creating drawings that represent this environment.
4. Evaluate desirable patterns for regions, communities and individual dwellings by engaging in discussions of perception, future impact and positive/negative opinion.

**INSTRUCTIONAL METHOD**

This course will use the following methods of instruction:

1. Lectures, Videos & Demonstration presentations

2. Quizzes and examinations

3. Cooperative studying and learning

4. Guest Speakers

**CLASSROOM AND COLLEGE POLICIES:**

1. Coconino Community College is committed to a drug-free environment.
2. No Tobacco in any form in classrooms or the shop please.
3. Please turn your cell phones to vibrate during class. Take calls outside of class room.

* Please become aware of all emergency exits in your classrooms and labs. Emergency exits are posted next to the door in every classroom.
* Quizzes and lab assignments are not repeatable.

1. Exams will only be given on exam dates only, unless previous arrangements are made.

Under no circumstances may an exam be made-up without prior arrangements with the

Instructor.

This material may be made available in an alternative format upon request by contacting this Disability Resources Office. Should a student enrolled in the course require a special accommodation due to a disability in order to complete the requirements of the course, contact the Disability Resources Office 1-800-350-7122

**ETHICS**

* Each student is responsible for completing his or her own work.
* **Duplicating another person’s work or turning in projects that are not your own will result in a zero on that assignment or quiz for all parties involved.**
* Cheating on a quiz/exam will result in a zero on that quiz/exam.

**EVALUATION :** Grades will be based on attendance, participation, Quizzes, and the final project

1. This course will be reading and writing intensive.

2. Mid-terms and Final Exam will cover materials presented in class.

3. A basic design for affordable housing will be due as shown on schedule.

4. A personalized design project, with Pattern recognition and technical outline will be

due near semesters end

5. Assignments must meet the designated deadlines or be subject to a 20% reduction in

value. Late work will be accepted for one week after due date only. Extra credit must

have prior approval & be submitted before final project.

**GRADING STRUCTURE**

**Attendance & Participation = 10%**

**Group design Project = 25%**

**Personal House Design Project = 25%**

**Reflective papers and Video Assignments = 40%**

**STUDENTS will receive half credit in the attendance and participation grades for being LATE for class and full credit for ABSENCES unless they contact the instructor prior to being late or absent.**

**GRADING SYSTEM**

100% – 90% = A

89% - 80% = B

79% - 70% = C

69% - 60% = D

59% - 0% = F

**EXTRA CREDIT**

The following field trips are optional for extra credit and will be scheduled by students on an individual basis. (Students responsibility)

* Taliesin, Frank Lloyd Wright’s Studio in Scottsdale AZ.
* The La Posada Hotel, Winslow AZ
* Arcosanti , Paolo Soleri, Cordes Junction AZ

Other speakers who present material of current & relevant material and other locations may be proposed on an individual basis.

**ATTENDANCE**

***Attendance will be taken in this class. If you fail to attend the first week of class (for in-person classes) or fail to log-in and participate by the identified date (for online courses), you will be counted as absent, and you will be dropped. Financial Aid students that exceed the number of absences for a class will have financial aid reduced and/or revoked due to non-attendance, and will owe money to the College. Students may also be suspended from receiving Financial Aid in future semesters for failure to attend classes in the current semester. It is especially important that Financial Aid students attend all classes so that this does not happen. Regardless of whether or not you are a Financial Aid student, if you are going to be absent from a class, you need to inform your instructor that you will be absent. Failure to notify the instructor could lead to being dropped from class and/or your financial aid being reduced or cancelled.***

* Students are expected to attend the lecture sessions and attendance will be recorded. Lab times are provided to allow sufficient time for completion of projects, participation is expected.
* Excessive absences may result in loss of course credit. More than two unexcused absences are considered to be excessive. Instructor may Drop you from class after 3 unexcused absences
* Students are responsible for asking the instructor for any assistance needed.
* Semester dates are subject to change

**This instructor reserves the right to make addition, deletions, and modifications to the syllabus and course requirements with reasonable notification to the student(s) enrolled.**

Grading Rubric: ALL WRITING ASSIGNMENTS

|  |  |
| --- | --- |
|  | **Grading Strategy; Good Evidence of Critical Thinking** |
| Basic | Does writing adequately answer all questions posed? |
|  | Does writing adequately provide example of applications? |
| Average | Is it clearly written? |
|  | Is this evidence of individual’s own thoughts about topic? |
| Above Average | Has student demonstrated a degree of excellence beyond minimal requirements of assignment? |
| Excellence | What evidence is there of use of outside references, images, illustrations, ect. To show research on topic? |

**Class Schedule subject to change**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date | Reading Assign. | Patterns | Pages | Assignments |
| Aug 31 | Introduction |  |  |  |
| Sept 2 | Design Considerations |  | ix-xxxiv |  |
| Sept 7 | LABOR DAY |  |  | NO CLASS |
| Sept 9 | The language of patterns |  | xxxv-xliv |  |
| Sept 14 | Patterns | 4,5,9,11,22,60,62 |  |  |
| Sept 16 | Family | 75-79 | 375-396 | Reflective # 1 |
| Sept 21 | Buildings | 95,96,98,99,100 | 463-491 | VA # 1 |
| Sept 23 | Site | 104-109 | 507-538 |  |
| Sept 28 | Entrances | 110-113 | 539-556 | VA # 2 |
| Sept 30 | Open Spaces | 114-118 | 557-578 |  |
| Oct 5 | Arcades | 119-126 | 579-608 | VA # 3 |
| Oct 7 | Intimacy Gradient | 127-135 | 609-646 |  |
| Oct 12 | Areas & Room for House | 136-140 | 647-667 | Reflective #2 |
| Oct 14 | A Room of One’s Own | 141-145 | 668-688 |  |
| Oct 19 | Offices | 147-152 | 696-718 | VA # 4 |
| Oct 21 | Out buildings | 153-158 | 719-744 |  |
| Oct 26 | Mid-term |  |  | Collage Presentation |
| Oct 28 | Mid-term |  |  | Collage Presentation |
| Nov 2 | Treating the Edge | 159-163 | 745-768 |  |
| Nov 4 | Between the Two | 164-168 | 769-788 | VA # 5 |
| Nov 9 | Garden Places | 169-178 | 789-826 |  |
| Nov 11 | VETERAN’S DAY |  |  | NO CLASS |
| Nov 16 | Minor Rooms & Alcoves | 179-184 | 827-856 | Reflective #3 |
| Nov 18 | Bed Rooms | 185-189 | 857-874 |  |
| Nov 23 | Shapes & Sizes | 190-196 | 875-906 | VA # 6 |
| Nov 15 | Wall Depths | 197-204 | 907-931 |  |
| Nov 30 | Efficient Materials | 206,207,209,211 | 946-988 | Reflective #4 |
| Dec 2 | Doors, Windows & Stairs | 221-239 | 1045-1111 |  |
| Dec 7 | Student Design Presentation |  |  | Design Presentation |  |  | Collage Presentation |
| Dec 9 | Student Design Presentation |  |  | Design Presentation |
| Dec 14 | Student Design Presentation |  |  | Design Presentation |
| Dec 16 | Student Design Presentation |  |  | Design Presentation |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

CTM 120 Building the Human Environment

Reflective Paper Requirements:

Reflective paper requires 2 pages minimum of typed written response to the topics below. This **DOES NOT** include illustrations or drawings that you wish to include in demonstrating your writing points. Be sure to answer all the questions and provide your understanding of the topic. The questions are a starting point and a general guide for developing your thoughts related to class discussions, readings assignments, library studies and other outside reading resources.

Pattern Question to answer

|  |  |  |
| --- | --- | --- |
| 1 | # 60, 61 | 1. Locate & Provide phot or sketch of an accessible green area near you 2. Describe 3 Positive effects of this area 3. Describe any undesirable aspects of this area 4. How has the local community used this (or could use) these patterns |
| 2 | Architecture | 1. Identify a particularly Inspiring building and provide an illustration 2. Identify & describe 4 ***“Patterns”***, in the architecture of this building, by referencing the “Pattern Language” book. 3. Describe the Qualities of this building via “Patterns” that inspired you 4. How would you incorporate these qualities or “Patterns” into your own living environment |
| 3 | Architect | 1. List an Architect that you find particularly inspiring to you 2. Describe 2 or 3 design features that this Architect uses that are of interest to you 3. List a building by this architect and identify and explain 3 “Patterns” you find in this building and how each “Pattern” has improved the quality of the design |
| 4 | Sustainability | 1. Describe &/or define sustainability in terms of “ A Pattern Language” 2. List and describe 4 “Patterns” that include ***YOUR*** concept of “Sustainability” 3. How could you use your ideas in your ***Final Design Project*** to include sustainable concepts and design |

When listing “Patterns”, please provide the number and name of that “pattern”.

CTM 120 - Building the Human Environment - Fall ‘15

Collage Group Presentation / Assignment

1. Select a Topic:

Topics can include:

a. “Pattern”(s) from the Pattern Language Book.

b. A particular Architectural Style

c. A “Green” Construction Material or method.

d. A Particularly Inspiring Building

e. An Architect

f. A Sustainability Issue

g. Instructor approved topic

2. Groups must be a minimum of 3 & no more than 4 .

Names of all members must be on Display / Collage

3. Use a Trifold, Self–Standing presentation board to display your pictures and information gathered. Use several Medias to display your topic, written info, your drawings, pictures from various sources, etc.

4. Bring material to hang your board on classroom wall for rest of Semester. Be prepared to add or subtract items from your display as the semester progresses. Class will select the top 3 displays at last day of class in December.

5. Class presentation and display will be graded

6. Project display material may be 3 dimensional with consideration given to limited classroom space.

7. During presentation list and include:

* Topic,
* Why you picked this topic to present / display.
* What you are presenting about the topic
* How the topic is represented and displayed
* Several things of particular interest to you concerning this topic
* References
* All Group members are expected to present info to class.

8. Please turn in your Peer Evaluation Sheets before leaving on Presentation Day

Collage Group Presentation Score Guide

Group Members:

1.

2.

3.

4.

During presentation list and include:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Team Member** | **1** | **2** | **3** | **4** |
| 1. Topic, |  |  |  |  |
| 1. Why you picked this topic to present / display. |  |  |  |  |
| 1. What you are presenting about the topic |  |  |  |  |
| 1. How the topic is represented and displayed |  |  |  |  |
| 1. Several things of particular interest to you concerning this topic |  |  |  |  |
| 1. References |  |  |  |  |

Notes:

CTM 120 - Building the Human Environment - Due Date: DEC. 7th

**A Pattern Language House Design**

Design a 2 or 3 bedroom house located in Northern Arizona using the following information.

1. List your languages set of at least 10 Patterns that you used to design this house. Show specific references to the 10 Patterns in the Pattern Language Book and how they were integrated into the design.
2. Design References – Show at least 2 specific references to information you have gathered on housing consideration for Northern Arizona and how they were integrated into the design. Include a Bibliography Reference and any other material or handouts used in the design work.

Assignment Expectations

1. One page minimum on occupant demographic considerations. In other words – Who is living in the house? This includes tables, graphs or illustration.
2. Demographics of occupants (min. 3) – This requires a chart
3. Chart – Use & Function, Needs of Occupants
4. Graphic Design – Relationship between rooms and occupants.
5. One page minimum on design considerations. This includes tables, graphs or illustration.
6. List any renewable energy & resource efficient goals.
7. Describe any specific site or topographical site feature considered.
8. Floor Plan- Scaled, Straight edged & drafted show room layouts and dimensions, window & door placement, solar orientation and any other amenities or specific features desired.
9. Show plumbing fixture layout to scale. (No electrical needs to be indicated)
10. Write up any material and design specifics necessary to communicate the home design
11. No elevations, cross sections or details required but do not hesitate to show some initiative.
12. Present via a Tri-fold display to class **OR** a 3 dimensional modeling of your building is acceptable in lieu of floor plan and must be accompanied with the above written documentation.

Describe your house plans to the class from Dec 7 – Dec 16 (Allow 10 – 12 mins.)

CTM 120 Final Project Design Score Guide

|  |  |  |  |
| --- | --- | --- | --- |
|  | Student Name: | Notes | Score |
| 1 | Patterns Used – at least 10 |  |  |
| 2 | Design References- at least 2 |  |  |
| 3a | Occupant Demographics (3 min.) - **One page minimum** |  |  |
| 3b | Relationship between rooms and occupant ( use and  function needs) |  |  |
| 4a | Design Considerations – **One page minimum** |  |  |
| 4b | Topographical Site, Renewable Energy & Resource  Efficiency goals |  |  |
| 5 | Floor Plan or 3D Model (Scaled) |  |  |
| 6a | Materials and Design Specification **– One page min.** |  |  |
| 6b | Plumbing fixtures, Amenities, Specific features |  |  |
| 7 | Presentation |  |  |

Grading Rubric:

|  |  |
| --- | --- |
|  | **Grading Strategy; Good Evidence of Critical Thinking** |
| Basic | Does writing adequately answer all questions posed? |
|  | Does writing adequately provide example of applications? |
| Average | Is it clearly written? |
|  | Is this evidence of individual’s own thoughts about topic? |
| Above Average | Has student demonstrated a degree of excellence beyond minimal requirements of assignment? |
| Excellence | What evidence is there of use of outside references, images, illustrations, ect. To show research on topic? |

NOTES:

**Coconino Community College**

**Course Syllabus**

**CTM 123 -** **Building Construction Methods** **1 – CRN 13351**

**Spring 2016**

Instructor’s Name: Ken Myers

Phone / E-mail: 526-7696 / kenneth.myers@coconino.edu

Class Schedule: Wednesday – 6:00PM – 9:00PM

Office hours are posted on my office door

**Textbook & Required Materials:**

Textbook:

1. Carpentry and Building Construction – Glencoe/McGraw-Hill

ISBN:9780078797842

Materials:

1. Calculator
2. Architects scale

**COURSE DESCRIPTION & GOALS**

This course will cover basic construction principles: Safety, tools, Materials, concrete Foundation construction, Floor & Wall wood framing systems. The course will concentrate on building methods, quantity estimation, hands-on skills and competency in safe use of Tools & Equipment.

**COURSE OUTCOMES**

The students will demonstrate by their scores on written examinations and demonstrated competency in lab and homework assignments:

1. Introduces students to the topic of safety in the construction industry and hazard recognition before an accident occurs on the construction site. Topics will include fall protection, scaffolding systems, ladder safety, personal protective equipment, and other construction related hazards.
2. Identify all basic instruments and tools used in wood framing construction and safety practices pertaining to the use of the instruments and tools.
3. Demonstrate the ability to read and understand blueprints and transfer information to building various structures.
4. Demonstrate an understanding of construction systems for:

a. Concrete

b. Foundations

c. Floor framing

d. Interior and exterior wall framing

1. Develop a working understanding of material and cost estimation as it relates to Concrete, foundations and wood framing construction.
2. Develop skills in basic construction math.

**INSTRUCTIONAL METHOD**

This course will use the following methods of instruction:

1. Lectures, Videos & Demonstration presentations

2. Quizzes and examinations

3. Cooperative studying and learning

4. In-class lab time.

1. Guest Speakers

**CLASSROOM AND COLLEGE POLICIES:**

1. Coconino Community College is committed to a drug-free environment.
2. No Tobacco in any form in classrooms or the shop please.
3. Please turn your cell phones to vibrate during class. Take calls outside of class

room.

* Please become aware of all emergency exits in your classrooms and labs. Emergency exits are posted next to the door in every classroom.
* Quizzes and lab assignments are not repeatable.

1. Exams will only be given on exam dates only, unless previous arrangements are

made. Under no circumstances may an exam be made-up without prior

arrangements with the Instructor.

This material may be made available in an alternative format upon request by contacting this Disability Resources Office. Should a student enrolled in the course require a special accommodation due to a disability in order to complete the requirements of the course, contact the Disability Resources Office 1-800-350-7122

**ETHICS**

* Each student is responsible for completing his or her own work.
* Duplicating another person’s work or turning in projects that are not your own will result in a zero on that assignment or quiz for all parties involved.
* Cheating on a quiz/exam will result in a zero on that quiz/exam.

**EVALUATION:**

Grades will be based on attendance, participation, Quizzes, projects, and the Final Exam

**Attendance & Participation = 20%**

**Shop Projects = 20%**

**Quizzes = 20%**

**Tests = 40%**

**STUDENTS will receive half credit in the attendance and participation grades for being LATE for class and full credit for ABSENCES unless they contact the instructor prior to being late or absent.**

**Possible extra credit up to 50 points**

**GRADING**

100% - 90% = A

89% - 80% = B

79% - 70% = C

69% - 60% = D

Less than 59 % = F

**ATTENDANCE**

***Attendance will be taken in this class. If you fail to attend the first week of class (for in-person classes) or fail to log-in and participate by the identified date (for online courses), you will be counted as absent, and you will be dropped. Financial Aid students that exceed the number of absences for a class will have financial aid reduced and/or revoked due to non-attendance, and will owe money to the College. Students may also be suspended from receiving Financial Aid in future semesters for failure to attend classes in the current semester. It is especially important that Financial Aid students attend all classes so that this does not happen. Regardless of whether or not you are a Financial Aid student, if you are going to be absent from a class, you need to inform your instructor that you will be absent. Failure to notify the instructor could lead to being dropped from class and/or your financial aid being reduced or cancelled.***

* **Students are expected to attend the lecture sessions and attendance will be recorded. Lab times are provided to allow sufficient time for completion of projects, participation is expected.**
* **Excessive absences may result in loss of course credit. More than two unexcused absences are considered to be excessive. Instructor may Drop you from class after 3 unexcused absences**
* **Students are responsible for asking the instructor for any assistance needed.**
* **Semester dates are subject to change**

**This instructor reserves the right to make addition, deletions, and modifications to the syllabus and course requirements with reasonable notification to the student(s) enrolled.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date | Reading Assign. | Chapter | Pages | Shop |
| Jan 20 | Intro/Career Safety  Skill saw | 1  3  5 | 6-12  83-88  128-136 | Where is everything Skill saw safety |
| Jan 27 | Ladders &  Scaffold  Quiz Ch. 1,3,5,7 | 7 | 204-205 | Ladder & scaffold video  Scaffolding |
| Feb 3 | Building codes  Plans | 2  2 | 34-38  41-48 | Saw horse |
| Feb 10 | Est. & Sched. | 2 | 59-75 | Saw horse |
| Feb 17 | Site layout | 9 | 236-250 | Layout exercise  Survey exercise? |
| Feb 24 | Concrete &  Trenching | 8 | 218-231 | Slump test/video  Video/Saw horse |
| Mar 2 | Footings & loads  CMU Block | 10 | 254-264  264-290 | Video/form work |
| Mar 9 | Flat work  Mid-term | 11 | 292-310 | Video |
| Mar 14 - 18 | NO CLASS |  |  | SPRING BREAK |
| Mar 30 | Wood basics Engr. Lumber & Panels | 12  13 | 314-334  338-367 | Saw horse/toolbox |
| Apr 6 | Struct. Sys & Span charts | 14 | 368-391 | Saw horse/toolbox |
| Apr 13 | Floor framing | 15 | 394-425 | Video/O.C. layout Saw horse/toolbox |
| Apr 20 | Quiz 2,13,14,15 |  |  | Video/framing mod |
| Apr 27 | Wall framing | 16 | 430-363 | framing mod |
| May 4 | Wall framing |  |  | Framing Mod. |
| May 11 | FINAL EXAM |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

On Center – O/C - Layout

Shop Activity

CTM 123 – Construction Methods I

Team Members:

1.

2.

Lay Out – On Center Spacing:

Mark & Lay out the following O/C dimensions & other markings on a 16 foot long board using correct Markings.

1. 16 inches on Center

2. 24 inches on Center

3. 19.2 in on Center

4. Mark for a Stud

5. Mark for a Trimmer & Stud

6. Mark for a Corner Stud

7. Mark for a Door Opening 3 foot wide

8. Mark for a Window opening 4 ft wide

9. Mark for a 2 X 6 Channel

10. What is the length for the door Header

11. Measure & Record the length of a pre- Cut Stud

Have Instructor verify O/C lay outs & Turn into Instructor when Completed:

Date :

Scaffolding Set – Up

Shop Activity

CTM 123 – Construction Methods I

Team Members:

1.

2.

3.

4.

5.

6.

**As a team :**

* Set up the scaffolding frames in the shop from complete disassembly to finish assembly & then back to complete disassembly.
* Observe all Safety Precautions

**You will need :**

1. 4 - Scaffold Frames

2. 4 - Casters

3. 2 – Safety Frames

4. 6 – Scaffold Planks

5. 4 – Cross Braces

6. 16 - Safety Pins

7. 2 - Safety Rails

Instructor Check :

1. Start :

2. Fully Assembled :

3. Complete Disassembly:

Site Layout

Shop Activity

CTM 123 – Construction Methods I

Team Members:

1.

2.

3.

4.

Shapes Laid Out :

1. Small Rectangle :

2. Square :

3. Larger Rectangle :

4. L – Shape :

5. Hogan :

Level Layout

Shop Activity

CTM 123 – Construction Methods I

Team Members:

1.

2.

3.

4.

Leveling Exercise : In Parking Lot

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | Max Height Min. Height Elevation Difference | | | |
| 1. | Water Level |  |  |  |
|  |  |
| 2. | Builders Level |  |  |  |
|  |  |
| 3. | Laser Level |  |  |  |
|  |  |

Water Level Readings:

Curb

Wall

Center

Builders Level Readings :

Curb

Wall

Center

Laser Level Readings:

Curb

Wall

Center

**Procedures for Day Tool Box :**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Day Tool Box |  |  |
|  | **Objective:** To assembly from cut parts a Tool Box that is **Square** & sits **Flat** on a work Bench or Floor |  |  |
| **Steps** | **Tasks :** | **Tools :** | **Intls.** |
| 1 | Layout & Rip Cut 5/8” Plywood for Sides | Skill Saw |  |
| 2 | Layout & Rip Cut 5/8” Plywood for Bottom & Ends | Skill Saw |  |
| 3 | Trial fit (Clamp) Bottom to Sides, Trial fit ends (Clamp) Check for Square & Flat Bottom. Check for Joint Gaps. | Skill Saw |  |
| 4 | Finish cut sides, bottom & ends to fit as needed. See drawing detail. | Skill Saw |  |
| 5 | Layout Ends for angle cuts. Clamp or screw together & cut angles as a pair. | Skill Saw |  |
| 6 | Check Handle Diameter (OD) - ( ¾ “ EMT)  Layout location & Drill holes for handle as a pair . | Power drill |  |
| 7 | Glue & screw Bottom, Ends & Sides together.  Check for Joint Gaps.  Check for Square & Flat Bottom on Work Bench | Cordless Drill,  Power drill or screw gun |  |
| 8 | Cut material for handle. ( ¾ “ EMT)  Install Handle & block into place. | Hack Saw |  |
| 9 | Add internal compartment features as desired | Saws & Screws |  |
| 10 | Take finished tool box to instructor for grading. |  |  |
| Notes | * Use 1-5/8” Deck Screws or Serrated Drywall nails for Assembly. * Glue all Joints. |  |  |
|  |  |  |  |
| **Grade:** | **E**= 95% **VG** = 88% **G** = 78% **F** = 68% or  **TA** = Try Again |  |  |
|  | After Grading - Take Tool Box Home ! |  |  |

Appendix B Job Description of **Full** Time Faculty



|  |  |
| --- | --- |
| **Job Title: Full-Time Faculty** | **Pay Grade: Salary placement is based on education and experience.** |
| **Department: Career and Technical Education** | **FLSA: Exempt** |
| **Reports To: Department Chair of Public Safety and Sustainable Building** | **Revision Date: 6/2011** |

**Summary**

Responsible for teaching courses, developing curricula, and assessing learning outcomes in the construction and sustainable building. Also responsible for providing assistance and academic advising to students outside of regularly scheduled class time. Teaching assignments may include alternative delivery methods including web and ITV, day, evening and weekend classes, and may be at multiple sites. This is a full-time, benefits eligible.

**Essential Duties and Responsibilities**

1. **With students:**
   1. Teaches 30 load hours per year.
   2. Formally evaluates student performance.
   3. Prepares and implements syllabi in accordance with course outcomes and competencies.
   4. Keeps and submits all essential instructional records according to the College calendar.
   5. Provides instructional assistance and academic advising outside of regularly scheduled class time.
   6. Maintains five posted office hours
   7. Participates in developing standards for the admission, progression and graduation of students
2. **With colleagues:**
   1. Assists department chair in the evaluation of part-time faculty as requested.
   2. Participates in hiring committees as requested by the department chair.
   3. Participates in department and college-wide meetings and serves on committees.
   4. Collaborates with faculty at other sites on course delivery and consistency as needed.
3. **Scheduling:**

Provides schedule building input and review as requested

1. **Budget:**
   1. Cooperates with the department chair for fiscal responsibility of the department budget.
   2. Makes recommendations for and assists with departmental purchases and expenditures
2. **Assessment and strategic planning**
   1. Promotes the mission, values, purposes, and strategic plan of the college and learning college philosophy
   2. Participates in the development, implementation, and assessment of programs, including the assessment of student learning outcomes, utilizing approved assessment methods.
3. **Curriculum:**
   1. Develops new or revises existing curricula using feedback such as (i) assessment data; (ii) ATF agreements; (iii) advisory board recommendations; (iv) community and other sources.
   2. Remains current in practices, trends, and research related to areas of assignment to include participation in ATFs or other statewide meetings.
   3. Responsible for maintaining discipline/course specific certifications and licensing where appropriate in order to fulfill teaching assignment.
   4. Assists in the building of programs through efforts such as recruitment.
4. **Leadership:**
   1. Works collegially in a team environment.
   2. Participates in the operations and/or shared governance of the college through college committee assignments and faculty meetings.
   3. Fosters relationships in the community to create resources for programs and students. This may include participation in Advisory Councils or external boards.

**Knowledge, Skills and Abilities**

Ability to teach effectively. Knowledge of the subject area, computer and related technology. Ability to maintain professional ethics and confidentiality of students and staff. Ability to support and promote the mission, values, purposes, and strategic plan of the College. Ability to work in a culturally diverse and team environment. Ability to integrate subject area with other related curricula. Knowledge of the applicable state and federal laws, such as FERPA.

**Minimum Qualifications**

Bachelor’s Degree in construction or related field and 3 years experience in occupational field or any equivalent combination of education, experience and/or training to meet Coconino Community College credentialing requirements.

**Preferred**

Recent experience teaching in a community college setting. Experience working with a diverse student population.

**Physical Demands**

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.While performing the duties of this Job, the employee is regularly required to stand; walk; sit; use hands to finger, handle, or feel and talk or hear. The employee must occasionally lift and/or move up to 25 pounds. Specific vision abilities required by this job include close vision and ability to adjust focus.

**Work Environment**

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. The noise level in the work environment is usually moderate.

**NOTE: This job description is not intended to be all-inclusive. Employee may perform other related**

**duties to meet the ongoing needs of the organization.**